

REDUCING THE SUBJECT CONTENTS, AIMS OF THE PHASES OF A LESSON, AND DESIGNING A LESSON

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W. L. OOSTHUIZEN

TO THE STUDENT

When you study the contents of this chapter you should be able to do the following:

- * explain what the reduction of subject contents for a lesson entails;
 - * classify the reduced subject contents according to particular content criteria;
 - * distinguish among the various levels of proficiency on which students can achieve and plan this into a lesson design;
 - * describe and plan the essentials of each of the aims of the phases of a lesson;
 - * formulate the learning aims for a lesson.
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1. REDUCING SUBJECT CONTENTS AND DESIGNING A LESSON

In school the child "encounters" the subject contents as they are delimited and ordered in the syllabi of the various subject areas. Instead of the spontaneous, naive, and natural confrontation with learning material as occurs in the family, in school this is changed to a formalized, systematized, and scientific confrontation.

The subject contents taken up in the school syllabi represent the choices of the syllabus compilers after they have teased out a large variety of cultural contents from a broad field to avoid overburdening but at the same time to arrive at an agreement of the formative quality of the topics on the basis of a reduction of the domains of reality. From this it is seen that subject contents are not chosen arbitrarily but rather in terms of particular principles and criteria. Thus, subject contents are chosen on the basis of their **formative quality**. The intellectual ability and developmental level of the child in a particular cultural situation make demands that influence the delimitation and choice of the subject contents. Subject contents thus are slices of the culturally valued and are

continually amplified; their quality is a reflection of the results of years of refinement in which the most gifted thinkers in each area of knowledge have worked together. The case then always exists that the teacher, as interpreter of the syllabus, does not have to discover the essentials contained in the prescribed subject, theme or method with the consequence that he might teach on too high a level or descend to such a low level that he bores his pupils.

Although the cultural contents already are taken up and ordered in the syllabus, this does not guarantee that the concepts necessarily are going to become part of the child's life world. The child's mastering and making his own the syllabus subject remains a question of teaching. Thus, the first task of the teacher is to penetrate to the essentials of the syllabus subject by reducing it. Only when he has succeeded in doing this will he be able to place the syllabus subject within the questioning-horizon of the child as a problem.

The teacher, as interpreter of the syllabus contents, sometimes finds himself in a difficult position. Describing a particular domain of reality as this is taken up in the syllabus often lends itself to a **factual** as well as **symbolic interpretation**. Over the years some words have acquired so-called "refined" meanings and under various circumstances and in successive situations varied meanings are given to the same word.

The teacher's primary task, as someone who has knowledge and a mastery of his subject, is to **interpret the learning aim**. To do this, he has to reduce to its essentials the subject as taken up in the syllabus. His interpretation and following representation have to be meaningful for the child as well as point to the learning aim, i.e., to unlock the essentials of the matter. **The teacher's reduction of the subject and his interpretation of the disclosed learning aim are of fundamental significance for any didactic design.**

Thus, it is clear that the cardinal aspects of the learning aim cannot be unambiguously read from the syllabus but have to be delimited and refined anew by the teacher. From what is disclosed by the reduction, the teacher needs to work through to a meaningful statement of a problem because effective learning has its onset in a **meaningful problem**.

There is no sense in the teacher merely going into class and simply announcing the problem because by this means there is no problem for the child. There is no use to announce the plan at the beginning of a lesson and postulate it as a learning aim. Only when the child proceeds to view the matter himself as a problem can he discover the incompleteness of his understanding, i.e., become aware of aspects that for him appear foreign, inexplicable and thus problematic. The learning aim can be turned into a problem only if the pupil already can give a degree of meaning to it on the basis of his available stock of knowledge and awareness (i.e., foreknowledge).

To make the problem meaningful to the child, the learning aim needs to be turned into a question. Thus, a questioning attitude only can be actualized if the child can be roused to self-activity on the basis of sensing something as unfamiliar, foreign, surprising or even funny. As soon as he becomes involved in the matter, he begins to seek "something" familiar that he can isolate and name. Thus, meaning is attributed to the problem only if part-aspects emerge that he can recognize on the basis of his foreknowledge. Therefore, it is the teacher's task to anticipate, on the basis of his knowledge of the learning aim what foreknowledge has to be recalled so it can serve as a point of departure for stating a problem.

To present a problem to the pupils the teacher has to try to obtain one or more suitable **examples** that inherently include the essentials of the matter as revealed in his reduction and that will be disclosed by his instruction. Therefore, it is necessary to look for examples that inherently include the essentials of the learning aim and can mirror them for the child. To acquire greater certainty regarding the quality of the example and whether it can be applied effectively, the example itself has to be reduced. However, reducing subject content can never be equated merely with analyzing or disclosing its elementals (essentials) because although there is a search for examples of elementals still they always have to be recognizable as meaningful examples of a particular subject. This means that the field of study, its language, validity and typical methods are aspects that can influence the choice of an example. In other words, the unique nature of the subject should never be lost sight of.

In order to carry out a meaningful reduction of subject content, **subject-specific knowledge and skills** that the pupils have to acquire need to be accurately taken into account but related **general skills** also have to be kept in view. Subject-specific knowledge and skills that the pupils need to acquire can be differentiated into subject nomenclature, relations and subject-specific skills.

2. SUBJECT NOMENCLATURE AND REDUCING THE CONTENTS

The comprehensibility and ordering of contents occur largely on the basis of attributing proper and common names, expressions and phrases that are linguistically formulated, and the descriptions and principles that make it possible to define matters. Teachers who reduce the subject contents of a lesson thus need to focus on clearly identifying certain subject nomenclature in their reduction. In a more general connection, the following subject nomenclatures are distinguished:

2.1 Proper names

The function of a proper name is to designate an **identity**. Thus, there is not a connection between the proper name and the person or place that receives it. The teacher need not look for intrinsic meanings and original ideas that are the conditions for the pupils acquiring insights because with proper names, **memorization** will be the learning activity and **deduction** will be the methodological principle for presenting proper names. Examples are the names of persons, places, pets, and objects.

2.2 Common names (types)

The function of a common name is to identify a **group or class**. The overarching type can again be divided further into smaller groupings, species, classes, or categories. When the teacher carries out his reduction activities of common names, he has to look for the essential meanings contained in the word. Thus, here the choice of an example that mirrors what is essential is very important. In the natural sciences exchangeable and interchangeable examples can be used. For example, the common name **fruit** can be clarified in terms of an apple, a peach or a pear. However, in the human/cultural sciences there are no exact interchangeable examples; therefore, an example or examples are used to indicate, in

a general way, the meaning of a common name and not to name or identify the particular example itself. For example, with reference to Benjamin Franklin (or Paul Kruger in South Africa) certain characteristics of a statesman can be pointed out.

2.3 Words (concepts)

The command of any subject area is indicated by more rigorous formulations and more abstract or conceptual meanings. Formulations and abstractions are conditions for a clear interpretation and judgment of matters. Thus, there is a move away from the everyday givens to a search for symbols and words by which the essential meanings can be described. This entails the use of words that describe the **essentials** of a matter, phenomenon, or object and the formulation of principles, laws, and rules that make possible future explanations, predictions and mastery. These words and formulations necessarily are subject-bound, e.g., congruent (mathematics); coalition (history).

2.4 Concrete and abstract concepts

Persons live in a world of language and symbols that go hand-in-hand with their life world. Within this life world, there are concepts that are **abstract** in the strong sense of the word because they are used to describe characteristics, confer meaning, and order reality. To understand something means to firmly grasp what is essential to it with the aim of later using it again. This activity has to be carried out by the pupils themselves. Particular concepts can be made directly experiencable initially by direct perception and on the basis of one or another form of illustration. On the other hand, there are concepts that can be presented only in non-perceptual ways.

2.5 Symbols (signs)

The symbol differs from the sign in that the sign has a unique, intrinsic meaning, i.e., it is obvious (e.g., road signs) while the symbol is not an obvious matter but acquires meaning as agreed on (e.g., symbols of operations: +; -; x; \div). Each symbol has the important characteristic of **neutrality** and thus has to be interpreted.

In acquiring insight, we usually have to do with a visual, linguistic, and logical structuring that partially are coordinated with and

supplement each other. The discovery of relations (connections) can thus play an important role in acquiring insight into subject contents.

3. RELATIONSHIPS AND REDUCING CONTENTS

3.1 Relationships among matters

Concept formation is a matter of insight into relationships, i.e., into mutual **relationships** that might exist among matters. The totality and complexity of reality only can begin to be mastered by also looking for relationships among matters, events, phenomena, magnitudes, etc.

3.2 Logical relationships

Reasoning, such as A is larger than B and B is larger than C, therefore A is larger than C, which often is encountered in mathematics, is a good example of a logical relationship. This form of reasoning is called a **syllogism**. A syllogism is reasoning that consists of two premises from which a **conclusion** is drawn, assuming the premises are true.

Example of a syllogism:

Major premise: If a person is 18 years old then he may vote.

Minor premise: John is 18 years old.

Conclusion: John may vote.

3.3 Visual relationships

Meaning is bestowed on a matter on the basis of **insightful perception**, near-to-life lived-experiences and direct viewing.

Example: The relationship found between plant growth and types of animals.

3.4 Aim relationships

Aims and goals **direct** the activities within the teaching situation. The refined delimitation of aims directs the teaching but also

presents a first selection and ordering of relevant facts that lead to an interrelated whole.

3.5 Causal relationships

Here there is a cause-effect relationship between two factors. The cause (motive) has to be sought to clearly delimit the relationship, i.e., the **relationship** between cause and effect must be sought.

In addition to nomenclature and relationships there is a third possibility, namely subject-specific skills unique to the nature of the particular subject area. In order to design goal-directed lessons and thus carry out the reduction of the subject contents, subject-specific skills also have to be taken into account and now are treated briefly.

4. SUBJECT-SPECIFIC SKILLS AND REDUCING CONTENTS

4.1 Experimenting

The procedure is usually that during the execution of an experiment the researcher manipulates an **independent variable** while controlling other **dependent variables**. During the execution of the experiment, also in connection with a lesson, the following teaching and learning activities should be taken into account:

- * delimiting and formulating the problem;
- * choosing equipment or measuring instruments;
- * correctly carrying out procedures;
- * controlling the non-experimental variables;
- * analyzing and interpreting results (data);
- * formulating conclusions.

4.2 Mapping

This entails composing and drawing maps, especially in geography.

4.3 Dissecting

This involves dissecting which especially is done in biology.

4.4 Constructing

This is making precise deductions from accurate drawings, especially in geometry.

4.5 Recipes

This involves preparing something by following given directions, especially in domestic science.

From the preceding it is noted that reduction includes two important steps: **separating essential and non-essential** learning contents for the lesson and, second, **classifying the essentials** into concepts, relationships, and skills. While designing a lesson, the unique nature of the subject, the aims concerning the relevant content, and the readiness of the students all play a decisive role in delimiting the essentials. It appears that the human sciences are more descriptive-understanding in nature while the natural sciences are more descriptive-explanatory. In addition, younger pupils will experience the essentials more concretely during their learning activities compared with the older students who already are more abstractly oriented.

5. GENERAL SKILLS

Often too much emphasis is placed on the subject-specific knowledge while subject-specific methods, general skills and methods related to the knowledge, are not noticed. The following general skills are distinguished:

5.1 Imitating

This is a low level skill because imitating presumes that an example is to be **repeated** without improving on it.

5.2 Interpreting

This is a higher-level skill since it involves searching for **focal points** and **connections**. Because the teacher cannot always treat all of the details in his presentation, he concentrates on the essentials that are delimited in the reduction. This requires that the child supplement the essentials by means of intuiting, representing, supposing and constructing that can lead to his interpretation of the matter differing from what the teacher wanted to accomplish in his presentation to the child.

5.3 Explaining

Explaining involves **recognizing** and **identifying** particulars as a rendition of what is valid in a general sense; thus, it is the discovery of the connection between the general and the particular.

5.4 Understanding

Understanding usually involves **deepening**, **intensifying** and **expanding** insight that rests on lived experiencing examples.

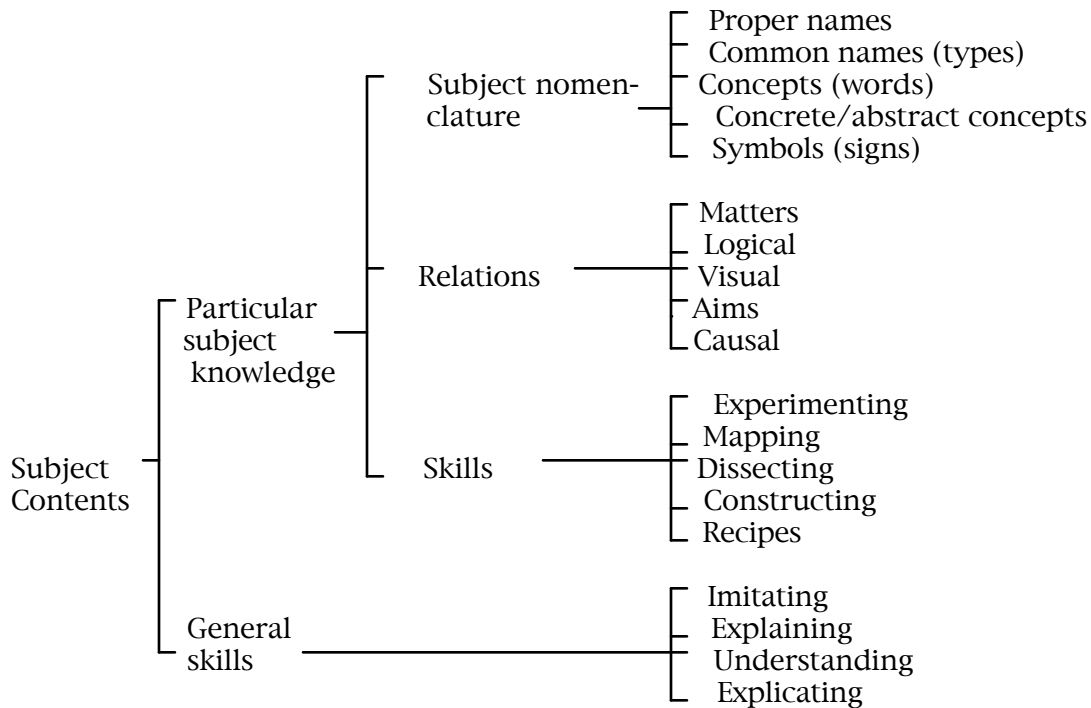
5.5 Explicating

This involves **elucidating**, **clarifying**, **disclosing**. Thus it involves disclosing essentials. Analyzing and synthesizing are conspicuous here and the result usually is naming or describing.

6. SUMMARY OF REDUCTION STEPS IN DESIGNING A LESSON

- (a) Differentiate the essential subject contents from the not essential for a particular lesson and specific group of pupils.
- (b) Identify the subject nomenclature and then order it.
- (c) Identify relationships among concepts that will help to acquire insight into the subject contents.
- (d) Decide on what level of skills the pupils must work, e.g., imitating, interpreting.
- (e) Now formulate the learning aims that the pupils must have attained by the end of the lesson.
- (f) In formulating the learning aim, the following should be indicated:
 - * what the pupil should be able to do at the end of the lesson;
 - * the level of skill at which he should be able to perform;
 - how much nomenclature (terms, concepts, etc.) should be known at the end of the lesson.
- (g) Reduced subject contents can be classified in terms of the scheme presented below:

CLASSIFICATION OF REDUCED SUBJECT CONTENTS



7. DESIGNING A LESSON AND THE AIMS OF THE (SIX) PHASES OF A LESSON

The verb at the foundation of the concept **lesson** is **to read**; the original meaning of **giving a lesson** refers to the fact that someone who can read does so to someone who can't. In the course of time, the high demands that life has placed on humanity have resulted in establishing schools. The spontaneous teaching situation encountered in the parental home becomes a formal or planned situation at school. In school, giving a lesson is the axis around which the practice of teaching turns. It is not a casual event but is goal-directed, systematic and ordered.

In a lesson, it is the teacher who has to take the lead or initiative. To be able to do this, he has to **plan, design, and make choices beforehand**. One of the first and also most important activities he has to carry out in designing a lesson is to **reduce the learning content** (see Section 1). This reduction is aimed at interpreting the essentials of the relevant contents of a lesson and, consequently, to

plan representations of them. The primary aim of these representations is to **present** the contents to the pupils (content as aim) but also to give them the opportunity to **themselves** achieve something particular with them (content as means). The general procedure for designing a lesson is that the teacher assumes that the pupils already have at their disposal a minimum amount of knowledge, skills, and proficiencies that can be made explicit.

Because effective learning has its onset in a meaningful problem, the teacher, in his design, will try to state and formulate a meaningful problem in terms of the pupils' foreknowledge. The teacher follows stating the problem by searching for possible solutions, first by demonstrating one or more examples, then by working together with the pupils and finally by giving the pupils the **opportunity** to work through some example(s) on their own. Thus, the following **aims of the phases of a lesson** are distinguished:

- * actualizing foreknowledge;
- * stating and formulating the problem;
- * exposing the new contents;
- * controlling the new;
- * functionalizing the new insights;
- * evaluating.

Each of these aims is an important aspect of the teacher's planning the course of his teaching. Each aim of a lesson phase is a teaching aim that he strives for and during which his pupils are to produce particular achievements. Each of these aims of the phases of a lesson is now elucidated.

7.1 Actualizing foreknowledge

The aim of this phase is to **stimulate** the pupils by trying to awaken their interest by linking up with what they know about the new contents. The way a teacher greets his pupils before the lesson begins will have a tremendous influence on stimulating and directing them. Through his greeting he can show a particular disposition that will allow his pupils to feel welcome or possibly unwelcome. Thus, this disposition influences the establishment of the teaching relationship.

The teacher cannot assume that subjects or themes that were treated on previous occasions and that are relevant to the present

situation merely will spontaneously and as a matter of course function for the pupils as explicit knowledge. Thus, it is important that he help them gain confidence and mobility with respect to the beacons and focal points out of which future structures can have their beginning. Consequently, to try to bring about the possibility for a meaningful unlocking (presentation), the teacher anticipates a **relevant field of foreknowledge** that has been made explicit by reducing the learning contents.

With the actualization of this relevant foreknowledge, a foundation is prepared for eventually unlocking and exposing the new subject or theme. Actualizing foreknowledge means that, on the basis of the teacher's reduction of the subject, only that foreknowledge that he regards as basic insights and meaningful starting points is to be made explicit again. The teacher aims to stimulate the pupils in terms of this relevant foreknowledge, i.e., by making them susceptible and sensitive to the new subject contents. Consequently, the contents have to have some familiarity to the pupils.

The teacher plans and designs a lesson and on the basis of the teaching aims (instructional and learning aims) he has delimited in his design, he becomes the initiator and organizer during the presentation of the lesson.

To assure that his aim(s) for actualizing foreknowledge are attained, the teacher must try, as far as possible, to **actively involve** his pupils in this phase of the lesson. Active involvement thus is an important aim to strive for during this phase of the lesson.

If the pupils do not have command of the relevant contents, the lesson cannot proceed as planned; then attention has to be given to the gaps that have come to light. In his preparation, the teacher should reflect on **how** he plans again to bring up the relevant subject contents and also what principles of actualization (guided-, joint-, and self-actualization--see Chapter 3) can assist the pupils to be **truly and actively** involved in learning. The teacher should carefully reflect on what lesson form and lesson modalities he is going to design to achieve the aim of this phase of the lesson.

A summary/synopsis briefly is shown in tabular form of what the aim is of actualizing foreknowledge and how to achieve this aim. The function of the three main components of a lesson situation--the content, teacher, and pupils--also are shown along with possible

criteria for providing the teacher with an indication of whether or not the aim has been attained. Similar tables are presented for the aims of each of the phases of a lesson treated hereafter.

Table 1: Actualizing foreknowledge

AIM: Stimulate and direct the pupils' learning.

HOW?: Link up with the known learning contents.

NATURE OF SUBJECT CONTENTS: Must be familiar with learning contents from experience or relevant foreknowledge.

TEACHER'S FUNCTION: Know the learning aim he has to initiate, organize.

PUPILS' FUNCTION: Active participation of as many pupils as possible.

CRITERION: When the teacher is confident that the pupils command the relevant subject contents.

When the teacher is confident that the pupils have mastered the relevant subject contents he can try to further stimulate them by turning the learning aim in his presentation into a problem for the child himself.

7.2 Stating and formulating a lesson problem

This aim of the course of a lesson is attained by putting the pupils in a situation in which the actualized foreknowledge is placed in a new relationship that **contains a problem** for them. The pupils now become aware of the incompleteness of their knowledge of the matter. Becoming aware of **something** problematic forces them to go back to reality itself where they try further to analyze and distinguish among things that appear to be known and unknown.

The aim of stating the problem is that the pupils have to become aware of the incompleteness of their knowledge. They need to experience the problem as a meaningful matter for them and, where at all possible, they should formulate it in their own words. By both the personal experience of what appears to be problematic and the guidance of the teacher, the pupils readily formulate the problem. Thus, here pupil participation is of particular importance. A first indication of the pupils' becoming aware of the problem is when they begin to **ask questions** or when a **questioning attitude** is

noticed. Conjectures and possible solutions by the pupils are of particular significance and value for the teacher and must be used.

Table 2: Stating and formulating the problem

AIM: Pupils must experience the learning aim as a problem.

HOW?: Turn the learning aim into a meaningful problem.

NATURE OF SUBJECT CONTENTS: Problematic: stimulate the experience of wonder.

TEACHER'S FUNCTION: Guide the learner to formulate the problem.

PUPILS' FUNCTION: Begin to search for solutions.

CRITERION: When the pupils begin to ask questions. Questioning relationship.

When the problem is clearly identified and formulated, one can proceed to its solution. Then the teacher has to strive for the following important aim.

7.3 Exposing the new subject contents

The teacher decides when it is the right moment to **present or unlock the problem**. Here he has to be careful not to be premature in solving the problem. He must try to encounter the pupils on their own level of development and readiness. At this stage, the use of scientific terms should be used with caution. An example or examples now are **demonstrated** by the teacher or **worked through together** with the pupils in order to try to facilitate the unlocking of the problem for them. Through the exposition of a good example, the teacher helps the pupils quickly and efficiently arrive at a solution to the problem. The judicious use of teaching aids can increase the effectiveness of the presentation. The aim of the exposition of the new contents is to solve the problem. Reality now has to be unlocked in its essentials, as disclosed in the reduction, so the pupils can master this aspect of reality with assurance and self-confidence. The examples the teacher shows the pupils serve as models by which they themselves can tackle new problems with greater confidence.

Table 3: Exposing the new subject contents

AIM: To solve the problem.

HOW?: Explanation in terms of good example(s).

NATURE OF SUBJECT CONTENTS: Essentials of the unknown contents must be shown (reflected).

TEACHER'S FUNCTION: He exemplifies (shows an example) and interprets.

STUDENT'S FUNCTION: Insight is attained in solving the problem.

CRITERION: When the problem is solved.

Insight into the example as presented by the teacher, however, is no guarantee that the pupils necessarily can now independently solve similar or relevant problems; therefore, the following aim is to check whether or not the pupils have arrived at an insight into the new.

Exposing (presenting) the new contents and controlling or actualizing them often occur simultaneously. Still, these two aims remain separate in the course of the lesson and since both have to be attained, they are treated separately.

7.4 Actualizing (controlling) the new contents

It is the case that the teacher, but especially the pupils, can have the mistaken impression that the insight seems to be sufficient with one or two examples. This means that the actualization of the new contents is neglected. In general, it is found that insight already has broken through for most of the pupils during the exposition and that they can now proceed to further **practicing** of these insights with **new and varied problems**.

However, it also is possible that the insight has not broken through for some of the pupils and opportunities need to be provided for them to practice **to** insight. One has to guard against verbalisms on the basis of too early an expression in the language of the particular subject. Therefore, it is essential that the students give a possible solution to the matter in their own language before proceeding to an exact formulation with the help of other pupils or the teacher. The aim of the control or actualization of the new subject contents is **to**

check on the teaching effect of the presentation, i.e., the pupils' level of insight has to be checked.

This checking can be done during or after the completion of the presentation. By demonstrating and working together on examples, the teacher tries to lead the pupils to an insight into the essentials, relations and methods regarding the contents under consideration.

Table 4: Actualizing (controlling) the new contents

AIM: Check whether the pupils have come to an insight.

HOW?: By asking questions during or after the solution of the problem.

NATURE OF SUBJECT CONTENTS: Must help to deepen the new insight.

TEACHER'S FUNCTION: Check the effect of his teaching.

STUDENT'S FUNCTION: Active concern through reproductive thinking and acting to eliminate uncertainties.

CRITERION: When the learning effect is achieved.

However, now that the insight has broken through it is necessary to practice the insight as an aim of the course of the lesson.

7.5 Functionalizing (transferring) the new insights

The term **functionalize** refers to the fact that the pupils have to **functionally apply** the **new insights** that barely are mastered. Thus, the new insights need to be **put to use**. The aim here is to help the pupils break loose from the particular example(s) that are demonstrated by or jointly worked on with the teacher. Here the pupils need to **practice, apply** and **themselves achieve**. Thus, there is an attempt to point out existing connections between the newly attained knowledge and the related (fore)knowledge already in stock. Through integrating the new and the old, there is a push to greater unity and to a more general structure in terms of which the pupils can have greater mobility and confidence in subsequent applications.

It is expected of the pupils that they will transfer and apply their acquired insights and knowledge to matters (problems) detached from the examples from which they originally acquired their insights. The teacher has to purposefully create opportunities for

practicing the insights. In his design, he needs to create opportunities for **applying** and **deepening** insights and for **stimulating conjectures** through **required** as well as **free assignments**. Note further that free assignments are not tied to subject specific examples.

Table 5: Functionalizing new insights

AIM: Practice the insight.

HOW?: Required and free assignments.

NATURE OF SUBJECT CONTENTS: Must not be committed to details of the subject but must link up with general proficiencies and methods.

TEACHER'S FUNCTION: Create purposeful opportunities for practicing, applying, etc.

STUDENTS' FUNCTION: Be productive, independent forming of proficiencies.

CRITERION: When the pupils independently transfer to assignments with insight.

To determine if the students can carry out the assignments independently and with insight, information can be collected through tests and examinations. Different from checking (controlling) the new content, now an evaluation of the students' insight and mobility in new situations is attempted.

7.6 Evaluating the insights

The aim of evaluating is to attempt to **compare** the achievement of the pupils as well as to give them the opportunity to themselves **discover**. Evaluation helps the teacher form an image of his students' work. Problems unique to individual students and difficulties with a particular part of the work shared by the whole class possibly can be indicated by tests.

To an increasing degree, evaluating is viewed as an integral part of the teaching event. This means that evaluating has a role to play in attaining the teaching aims. The function of evaluation can be differentiated into four main groups:

(a) **Evaluation directed to the entry level** is implemented to determine the knowledge and skills the pupils already have at their disposal. The function of this evaluation is to determine the

readiness of the pupils and, thus, in connection with the stated aims, to plan a teaching strategy that likely will bring about an optimal learning effect.

(b) **formative evaluation** points to the **collection of information** during the lesson with the aim of improving and adjusting the teaching strategy. For the teacher, this information is an indication of whether or not his strategy is succeeding, and it provides the pupils with the opportunity to evaluate themselves.

(c) **diagnostic evaluation** is directed at the correction or solution of learning problems that repeatedly appear after **normal** adjustment and change in teaching strategies on the basis of formative evaluation.

(d) **summative evaluation** normally occurs after a series of lectures (e.g., a final examination for a course). The aim is to determine to what degree the stated learning aims are **attained**.

7.7 Interpreting achievements

Basically, there are two ways of interpreting pupils' achievements, namely, norm-referenced and criterion-referenced assessments.

(a) **Norm-referenced.** This is when a pupil's achievement is viewed in relation to the achievement of a particular group in order to determine his relative standing. The interpretation of the pupil's achievement, thus, is **dependent** on the achievements of the other pupils in the group. Norm-referenced interpretation especially is used in selecting, comparing and guiding pupils.

(b) **Criterion-referenced.** This is when a pupil has to carry out or show a specifically prescribed activity or behavior as evidence that the stated aim is attained; e.g., type 40 words per minute. Thus, the interpretation of a pupil's achievement is **independent** of the achievements of the other pupils in the group. This is because the criterion is derived from the subject contents.

For an overview, a diagrammatic presentation of the aims of the course of a lesson is given below.

7.8 Synoptic classification of the aims of the (six) phases of a lesson

From the foregoing it is clear that the aims of the course of a lesson can be classified into two comprehensive aims:

- * content as aim;
- * content as means.

To design meaningful lessons, it is necessary to distinguish these two aims from each other so that in each lesson design they can be striven for and attained.

Content as aim [as elemental] means attaining and **commanding** subject contents. Here the teacher is prominent and busy **instructing** by unlocking reality in terms of good examples as well as initiating and guiding. Here he strives for **teaching effects** that can be judged in terms of didactic categories. A necessary consequence of this is that the pupils' attitude and function will be **dependent-receptive** in nature.

Content as means [as fundamental] refers to pupils using content to themselves order, apply and create. Independent activities and practicing new insights until they become fundamentals (i.e., become functional) is conspicuous here. Thus, pupils strive for the learning effect(s) that can be judged in terms of didactic criteria.

A Diagrammatic Presentation of the Aims of the Course of a Lesson

