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

2

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.

---

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 resulting from a reduction of the domains of reality. From this it is seen that subject contents are not chosen arbitrarily but in terms of principles and criteria. Thus, subject contents are chosen for their **formative quality**. The intellectual ability and developmental level of the child in a particular cultural situation make demands which influence the delimitation and choice of the subject contents. Subject contents, thus, are slices of the culturally valued and are continually amplified; their quality reflects 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/she might teach on too high a level or descend to such a low level that he/she bores his/her pupils.

Although the cultural contents are already taken up and ordered in the syllabus, this does not guarantee that the concepts are necessarily going to become part of the child's lifeworld. The child's mastering and making the syllabus subject his/her own 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/she has succeeded in doing this will

he/she 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 him/herself 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/her subject, is to **interpret the learning aim**. To do this, he/she must reduce to its essentials the subject as taken up in the syllabus. His/her interpretation and following representation must 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/her interpretation of the disclosed learning aim are of fundamental significance for any didactic design.**

Thus, the cardinal aspects of the learning aim cannot be unambiguously read from the syllabus but must be delimited and refined anew by the teacher. From what is disclosed by the reduction, the teacher must work through to a meaningful statement of a lesson 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, in doing this, there is no problem for the child. There is no use to announcing the plan at the beginning of a lesson and postulating it as a learning aim. Only when the child comes to view the matter as a problem him/herself can he/she discover the incompleteness of his/her understanding, i.e., become aware of aspects which, for him/her, appear foreign, inexplicable, and, thus, problematic. The learning aim can only be turned into a problem if the pupil can already give a degree of meaning to it based on his/her available stock of knowledge and awareness (i.e., foreknowledge).

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

To present a problem to the pupils, the teacher must obtain one or more suitable **examples** which inherently include the essentials of the matter as revealed in his/her reduction, and which is disclosed by his/her instruction. Thus, it is necessary to look for examples which 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 must 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 must always be recognizable as meaningful examples of a particular subject. This means that the field of study, its language, validity, and typical methods are aspects which can influence the choice of an example. In other words, the unique nature of the subject should never be lost sight of.

To carry out a meaningful reduction of subject content, **subject-specific knowledge and skills** which the pupils must acquire must be accurately considered, but related **general skills** must also be kept in view. Subject-specific knowledge and skills which the pupils must 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 by attributing proper and common names, expressions and phrases which are linguistically formulated, and the descriptions and principles which make it possible to define matters. Teachers who reduce the subject contents of a lesson, thus, must 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 wjich receives it. The teacher need not look for intrinsic meanings and original ideas which are the conditions for the pupils acquiring insights because, with proper names, **memorization** is the learning activity and **deduction** is 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/her reduction activities of common names, he/she must look for the essential meanings contained in the word. Thus, here the choice of an example which 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 specific 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 which describe the **essentials** of a matter, phenomenon, or object and the formulation of principles, laws, and rules which make future explanations, predictions and mastery possible. These words and formulations are necessarily subject-bound, e.g., congruent (mathematics); coalition (history).

2.4 Concrete and abstract concepts

Persons live in a world of language and symbols which go together with their lifeworld. Within this lifeworld, there are concepts which 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 must be carried out by the pupils themselves. Concepts can be made directly experienceable, initially by direct perception by which there can be one or another form of illustration. On the other hand, there are concepts which 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; ·/.). Each symbol has the important characteristic of **neutrality** and thus must be interpreted.

In acquiring insight, we usually have to do with a visual, linguistic, and logical structuring which 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** which might exist among matters. The totality and complexity of reality can only 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 which 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/she may vote.
Minor premise: John is 18 years old.
Conclusion: John may vote.

3.3 Visual relationships

Meaning is bestowed on a matter via **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 which lead to an interrelated whole.

3.5 Causal relationships

Here there is a cause-effect relationship between two factors. The cause (motive) must 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 subject area. To design goal-directed lessons and thus carry out the reduction of the subject contents, subject-specific skills also must be considered and are now 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 considered:

* 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 are already 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 the details in his/her presentation, he/she concentrates on the essentials which are delimited in the reduction. This requires that the child supplement the essentials by means of intuiting, representing, supposing, and constructing which can lead to his/her interpretation of the matter differing from what the teacher wanted to accomplish in his/her 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 specific.

5.4 Understanding

Understanding usually involves **deepening, intensifying** and **expanding** insight which 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 is usually 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 which will help to acquire insight into the subject contents.

(d) Decide on what level of skills the pupils must work, e.g., imitating, interpreting.

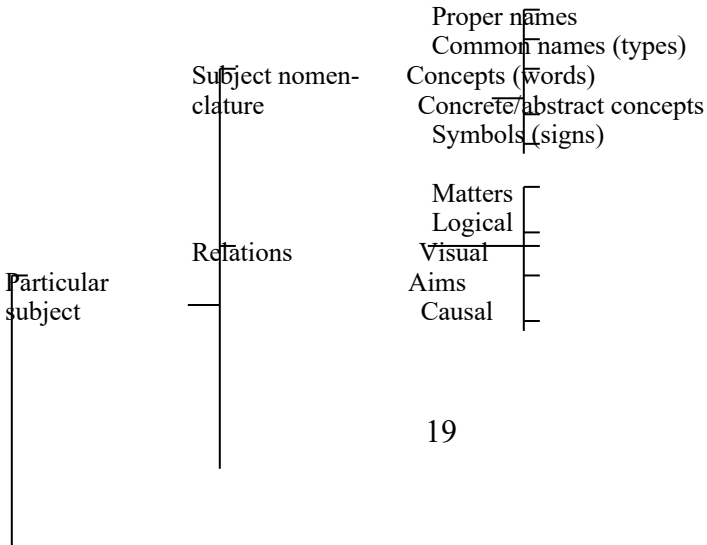
(e) Now formulate the learning aims which the pupils must have attained by the end of the lesson.

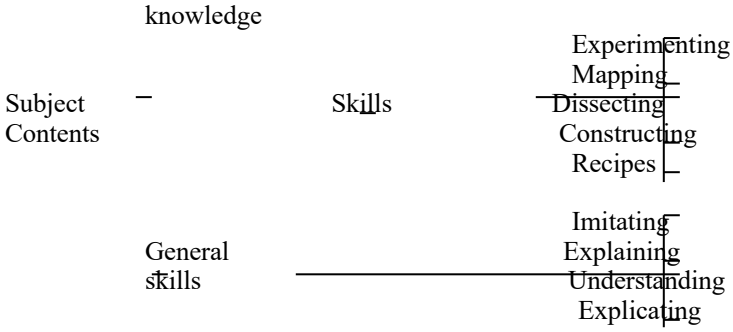
(f) In formulating the learning aim, the following should be indicated:

* what the pupil should be able to do at the end of the lesson;
* the level of skill at which he/she 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 someone who can read doing so to someone who can't. In the course of time, the high demands which 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 must take the lead or initiative. To be able to do this, he/she must **plan, design,** and **make choices beforehand.** One of the first and most important activities he/she must 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 [i.e., elemental]), but also to give them an opportunity to **themselves** achieve something particular with them (content as means [i.e., fundamentals]). 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 which can be made explicit.

Because effective learning has its onset in a meaningful problem, the teacher, in his/her design, will 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 an **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/her teaching. Each aim of a lesson phase is a teaching aim which he/she strives for, and during which his/her pupils are to produce achievements [learning aim(s)]. 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 awakening their interest by linking up with what they know about the new contents. The way a teacher greets his/her pupils before the lesson begins has a tremendous influence on stimulating and directing them. Through his/her greeting he/she can show a particular disposition which allows his/her 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 which were treated on previous occasions, and whoch 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/she 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 bring about the possibility for a meaningful unlocking (presentation), the teacher anticipates a **relevant field of foreknowledge** which has been made explicit by reducing the learning contents.

Consequently, the actualization of this relevant foreknowledge, a foundation is prepared for eventually unlocking and exposing the new subject or theme. Actualizing foreknowledge means that, based on the teacher's reduction of the subject, only that foreknowledge which he/she 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. Contents must have some familiarity to the pupils.

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

To assure that his/her aim(s) for actualizing foreknowledge are attained, the teacher must as far as possible, to **actively involve** his/her 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 must be given to the gaps which have come to light. In his/her preparation, the teacher should reflect on **how** he/she plans again to bring up the relevant subject contents, and 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/she is going to design to achieve the aim of this phase of the lesson.

A summary/synopsis 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 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/she must 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/she can try to further stimulate them by turning the learning aim in his/her 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 their actualized foreknowledge is placed in a new relationship which **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 further analyze and distinguish among things which appear to be known and unknown.

The aim of stating the problem is that the pupils must become aware of the incompleteness of their knowledge. They must 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 must 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/she must be careful not to be premature in solving the problem. He/she must 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 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 must 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 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 are separate issues in designing the lesson and even though both must 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 must be provided for them to practice **to** insight. One must guard against verbalisms from 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 must be checked.

This checking can be done during or after the completion of the presentation. By demonstrating and working together on examples, the teacher leads 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/her 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 must **functionally apply** the **new insights** which are barely mastered. Thus, the new insights must be **used**. The aim here is to help the pupils break loose from the specific example(s) which are demonstrated by or jointly worked on with the teacher. Here the pupils must **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 transfer and apply their acquired insights and knowledge to matters (problems) detached from the examples from which they originally acquired their insights. The teacher must purposefully create opportunities for practicing the insights. In his/her design, he/she must 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 **compare** the achievement of the pupils as well as to give them an opportunity to themselves **discover**. Evaluation helps the teacher form an image of his/her 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 his/her strategy is succeeding, and it provides the pupils with an opportunity to evaluate themselves.
(c) **diagnostic evaluation** is directed at the correction or solution of learning problems which repeatedly appear after **normal** adjustment and change in teaching strategies based on the 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

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 to determine his/her 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 must 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, 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/she strives for **teaching effects** which can be judged in terms of didactic categories. A necessary consequence of this is that the pupils' attitude and function sre **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) which can be judged in terms of didactic criteria.

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