SUBJECT DIDACTICS*

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A. General orientation and historical introduction

The fact which must be well understood here, and which can be of particular significance for the explanations to follow, is that, in each period of history, there are contemporary demands specifiable, but also that there are particularly timely efforts in the development of a faculty (Education).

The constituent disciplines and their structural relations, as well as functional interactions, as a total framework for teaching and training, as they appear today, are not haphazard matters. This configuration is the result of the achievements of several dedicated academicians within meaningful institutional systems. There are clear signs that peculiar and specialized demands appear to be placed on the faculty, from time to time, regarding its purely scientific, as well as its training tasks.

Therefore, to fully understand the task of Subject didactics in the faculty, first, it is related to the other pedagogical perspectives, and especially didactic pedagogics, within a larger **macrostructure**. Subsequently, an analysis of several school subjects, and their unique nature, is necessary to establish a **microstructure** for each, with the expectation that certain groups of questions can be assembled and classified for some neighboring subjects.

What is clearly argued from the above is that the type of participation of existing departments, in certain areas, has become too extensive and so involved that the demands can no longer be met.

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In the early 1960's (1962), the department of Didactics and Historical Pedagogics, at that time, appoints two lecturers to begin teaching and training student teachers in certain **school subject methods**. Initially, one lecturer takes care of human science subjects (languages included), and the other, several natural science subjects. In each school subject method (mathematics), provisions are made for three theoretical lectures, a practicum, and a few prescribed criticism-lessons (controlled critical lessons). In the final year, students also receive weekly lesson demonstrations, where lecturers and students present to large groups of students (all languages) well-planned model examples of lesson evaluation, lesson analysis, lesson design, and lesson criticism in sequence.

Because, at this time, in the faculty, there is not yet a full-fledged pedagogics and, especially not a clear didactic pedagogics (grounding, terrain, categorical structure, lesson structure, etc.), the lecturers in subject methods largely are referred to subject science insights (mathematical methods), school experiences and, especially some principles borrowed from the psychology of learning and thinking. Here, concepts such as activity teaching, group and project work, object teaching, differentiation, individualization, principles of creativity, local folklore teaching, etc. are mentioned. In addition, the courses include such themes as curriculum compilation and interpretation, writing down essentials and board schemes, tests and memoranda, the subject teacher, the nature of the subject, as well as the readiness and ability of the pupils.

There is explicit attention given to offering critical-lessons (models), in which a distinction is made between general (educational) and particular (subject contents) aims, planning the course of a lesson following a fixed sequence (learning steps), and the use of suitable aids. Because certain principles are preferred above others in particular subject areas, specific **methods** sre worked out and repeated. Thus, there is a fixed scheme for the natural sciences (the scientific method), narration in history, problem posing methods in mathematics, and formal drill lessons in grammar.

To summarize everything, for dessert, there usually is a search for aspects of the school subject which clearly lends itself to the general "forming" of a child (formative quality, formal values of certain

school subjects), as well as for aims, such as cultural, social, ethical, esthetic, religious, and utilitarian values.

Because of the extent, lack of a basic structure, and generality of the aims, it is very difficult for the lecturers to offer meaningful courses. Usually, there is only a focus on specific points, and they are executed in practice (criticism-lessons).

Because it is not possible to treat the total field of **subject didactics** as it is known today, the focus is on the relation between didactic pedagogics and subject didactics.

B. Some relevant attributions of meaning to the components and relations of the teaching model

To be able to understand the structural (unique nature) and functional (meaning) components and their interaction ins of the total teaching event, it certainly is meaningful to first look at pronouncements made about this by a few pedagogic part-disciplines.

* Fundamental pedagogic - the education phenomenon
  reality (being) with essentials (fundamental categories)
  life world (beings) with meanings: life contents
  life forms
  life ways

* Psychopedagogics - the learning phenomenon
  person - child - adult
  life - becoming - learning - modes of learning
  affective - cognitive - conative (senso-motor)

* Didactic pedagogics - the teaching phenomenon
  Structural model I: teaching relevant life contents
  (i) elementals of reality: substantive
  operative
  (ii) fundamental meanings: verbalizing and
  embodying in symbols
  and signs.
  graphic representations

teaching relevant life forms:

(i) Didactic ground forms: conversation, play, example, assignment.
(ii) methodological principles: inductive, deductive, trans-ductive.
(iii) ordering principles: content directed (linear, etc.) child directed (symbiotic, etc.)
(iv) actualization principles: individualization, socialization, guided or self-activity, tempo-differentiation, etc.

teaching relevant ways of life (didactic modality):
(i) teaching modality: ways of teaching and teaching aids
(ii) learning modality: ways of learning and learning aids

* Sociopedagogics - the socialization phenomenon

2. A few functional models which consider a sequential series of lesson phase aims

Macro-view

Phase aim	Content	Form	Modality
Content as aim	elemental fundamental	play (example) conversation	self-perceiving guided (language)
	fundamental	(example) assignment	functionalizing (expressive-creative)

Micro-view

Content as aim: enlivenment of the child (foreknowledge, problem)
unlocking the new (good exemplar, textbook definition)

Content as means: practice (open and closed assignments)
application (productive and reproductive)
control (tests, examinations)

The view that there is a primary move from the didactic to method (subject didactic) is evident during theory forming in this faculty. During the 1960's, several pedagogical [part-] perspectives, among others didactic pedagogics, successfully generated an accountable theory which satisfied the scientific demands of a meaningfully founded, designable terrain, with a general categorical and criterial structure, as well as operationalizable aims. There is a consistent attempt to start from the primary teaching phenomenon (teaching and learning in the family), and identify basic components, primordial relations, and forms of living, with the aim of describing them.

When the disclosures of the other part-disciplines also are considered, and their answers to certain groups of questions are analyzed, that which appears to be general, valid, and essential, which are related to the nature (structure) and function of aims to be reached, are described and tied together in a theoretical model. In this case, first, a partial model appears for each of the component, such as the didactic ground forms, reducing the learning material, forming, didactic modalities, and the aims of the phases of the lesson. Naturally, only after this, and on their basis, and efforts of several lecturers, a lesson structure is constituted. This structural model strings together the three components of content (what), form (how), and modalities (in what ways) into a usable and a synoptic first model for planning a purposeful practice (formal lesson in the school).

It is precisely in implementing this structure, and its lesson phase procedures in a lesson design that a few problems surface. The first is with planning lesson modalities. This gives rise to further refining and differentiating teaching modalities (the participation of

the teacher) and learning modalities (that which a child must provide), at each phase, as expected responses).

Because, in preparing a lesson design, after each aspect of the teaching model must be viewed anew, a need is felt for a **theory between the didactic pedagogical** (general pronouncements about the primary [home] teaching situation) **and the school** (second order, formal and planned practice). Hence, the justification for establishing a subject didactic theory, with its central task of **particularizing** the lesson structure into a lesson design.

C. Several landmarks in forming subject didactic theory

The most important contributions to subject didactic theory is catalogued under a few **themes**. There is brief reference to some of these themes, and then a list of publications (research) is presented for further elucidation.

The following themes are briefly described:

* analysis and description of methodological forms.
* particularization, as subject didactic proficiency.
* the relations among structure, function, and situation.
* the differentiations among skill, proficiency, and technique.
* general and particular proficiencies.
* the bi-polar nature of teaching aims.
* specifying learning aims.
* a subject didactic model of learning.

2.1 Analysis and classification of methodological forms

Because of the comprehensiveness of the contents, and the extensiveness of the literature (everyday popular, scientific, school subject, and pedagogical) which a subject didactician must study, the ability of analysis (in the human science context of convergent thoughts) is a handy prerequisite. By a thorough and selective analysis of the available literature (past and present), as well as of the contemporary practice (school), an inventory of formulated alternatives and relevant accomplishments, and the figuring forth of the particular phenomenon (theme) is compiled. From such a data

bank, there is an attempt to focus (converge, reduce) on what is manifested as essential (characteristic), while the details (particularities) are left out. The result of each attempted analysis is, thus, an authentic insight into what has become explicit as essential. This new accomplishment then can be formulated precisely in language for others. Because, by intensive analysis, the subject didactician not only deals with many nuances and alternative meanings of the particular phenomenon, but also is in a privileged position (level of informed-ness and mobility) to try to classify it under a particular formulation. The large number of disconnected, and sometimes diffuse nuances, are now classified under a larger type of category. Hence, the [resulting] theory is more comprehensive, and a further ordering or taxonomy is easier.

By analyzing and classifying, there not only is a search for a **general** (overarching) formulation of what is conspicuously common, but the relevant, nuances (modi) are retained for later use in designing a particularized practice. By analyzing the teaching phenomenon from the resulting inventory of the formulations of a teacher's tasks, such as instructing, guiding, presenting, assigning, re-presenting, demonstrating, showing, ordering, etc., are chosen for inclusion in a comprehensive category, such as unlocking [reality].

Summary

Each investigation (analysis) begins by taking an **inventory** of existing formulations (oral and written), as well as of one's own formulation of relevant observations and views (views re ideas and actions).

To make the large number of nuances more manageable (synoptic), a functional **classification** (taxonomy) then is worked out. Even though the details of such **processing** are ordered under general (types) categories, the particularities (nuances) must be retained for later, effective selection for a particular practice (lesson structure).

2.2 Particularizing, as a proficiency in the subject didactic design of a lesson

In the previous section there is reference to the fact that the basic pedagogical disciplines (fundamental, didactic, psycho-, etc.) are primarily directed to arriving at **general formulations** or principles about what is disclosed as common, universal and, thus, essential to the teaching phenomenon in the family, as primordial situation. Hence, for example, three general components have been established, i.e., contents, form, and modality, and are included in a teaching model (lesson structure).

However, if the place and function of subject didactics is looked for where it takes a position between the pedagogical (theory) and practice, it fulfills a particularization function. As the name **subject didactics** indicates, it no longer has to do with a general view of **contents,** but with specific subject contents with a unique nature and structure. It does not have to do with a child (pupil), in general, but with a specific child (group, class, school phase) with particular potentialities. and on a particular level of readiness. A certain teacher teaches with a unique personality, style, and tact.

In the subject didactician's preparation of a particular lesson design (history theme for grade 8), he/she cannot merely implement the lesson structure unchanged. Each time he/she designs a particular lesson, he/she must search for the most suitable (fruitful) nuance for each component of the lesson structure. To effectively compile such a **particularized** lesson design, it is necessary that, within the general aims, there is a search for operational aims, and the unique nature of the subject (theme), as well as the potentialities and expectations of the particular pupil (group, class), be considered. Where junior secondary pupils must only be able to **name** and understand (interpret) the theme, senior secondary pupils must be able to analyze it, or even generate a unique achievement (synthesis).

2.3 The relations among structure, function, and situation

For the aim of subject didactic theory forming, the point of departure is the view that each phenomenon (concrete or operative) is essentially comprised of some components which can be identified as a unity (structure, system). Because of the relationships (interactions) among the constituent, such a unity has

its own form (nature) and/or course. Thus, e.g., the phenomenon "plant" has two basic components, i.e., **roots** and **stem,** which relate to each other in a particular way (plant form) and, thus, acquire a particular function.

The nature of the phenomenon, thus, remains inseparably dependent on these components, and their original relationship gives them a primary function. By analysis and refined formulation, a theoretical **structural** model for each phenomenon or system then is simulated.

Now, it can happen that the original ordering and interaction among the constituents must be changed to attain a specific aim (function). Here, we have to do with a planned (artificial) structure (system) which can only be functionally-correctly interpreted within a particular context. To facilitate interpreting such a secondary or intended system (structure), use then is made of **internalized** signs (symbols)

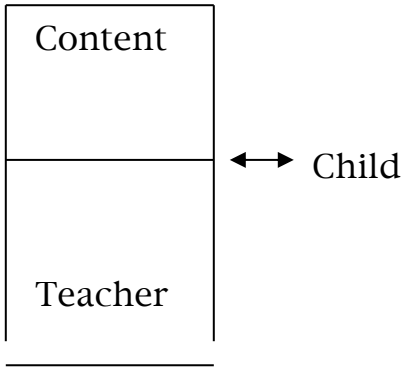
For example: __ + __ = __ (the functional model of the addition operation).

Thus, it is possible to show a **whole function** as well as a **planned** or **part-function** within a system.

Because it is not possible for the subject didactician (person) to acquire a total perceptual image (totality- or gestalt-view) of an operation (activity, course), as in the case of a concrete- visual object, he/she is compelled to implement an "aid" (aid for thinking). To divide the course (operation, event) into several **points of attention** during which the central part-functions become optimally discernible, and the function of each component of such a fixation point to identify (formulate) separately, he/she can try, by congealing the event at such a high point, to simulate (visualize) an image of it. In such a situation analysis, all the relevant constituents in particular positions are related to each other. It then is possible for another to see the positions of the participant, and with the help of certain signs and symbols, to interpret the functions of each component within the particular structure (system).

After viewing such a functional model, a co-subject or researcher can deduce the necessary information.

For example: Teaching situation (demonstration)



The teacher **unlocks** certain content for the child.
Nuance of unlocking: demonstrate.

The child **throws himself open** for the content. Nuance of learning

2.4 Distinctions among skillfulness, proficiency, and technique

In each phase of a lesson, there is a distinction between what must be unlocked for a child, which is new (unknown)--content as aim, and the further functionalizing and evaluating practiced regarding the new acquisitions--content as means. In each case, there are new concepts and relationships which must be mastered and implemented, but also of the **level of ability** on which the content has to be dealt with. For a more refined aim and function analysis, it is necessary to distinguish among three types of ability, i.e., skills, proficiencies, and techniques.

Skills the primary, naive **receiving impressions** from the external world (sensory) as well as the transfer of basic, spontaneous motor movements.
sensory: look, hear, grasp, taste, etc.
motor: scribble, grasp, turn, speak, etc.

Proficiencies where the transfer of a skill is guided or steered by knowledge.
In terms of the **knowledge** to push through to a refined, more precise **can do**.
listen (proficiency) embracing concept (interpretation)+ hear (skill)

say (proficiency) embracing concept (proposition) + speak (skill)
analyze (proficiency) embracing knowledge + converging interpretation.

Techniques where there is a joining together of a skill and/or Proficiency, also now an extension of the human body and mind (thinking), such as using an instrument, apparatus, or machine (invention).
write (technique) embracing speaking (skill) + saying (proficiency) + handwriting (grasp pen in a particular way with the aim of forming a symbol)
optical perception technique: where a microscope is used as an extension.

2.5 General and subject-specific proficiencies

By a further differentiation of the constituent "proficiency", as a type of **subject content,** it is extremely important for establishing a practice to further **classify** it. The division into **general** and **subject-specific proficiencies** is dealt with here.

General proficiencies--abilities which have relevance for mastering each school subject.
Examples: writing, speaking, naming, interpreting, ordering, reducing, etc.

Subject-specific proficiencies--abilities that are particularly relevant to a specific school subject.

Examples:	**School subject**	**Proficiencies**
	Mathematics	verifying solutions
	Biology	dissecting
	Afrikaans	scanning
	Accounting	bookkeeping
	Bible Study	preaching

A more complete description has already been accomplished in several pieces of research in the school subjects of Mathematics, Afrikaans, History, Biology and Business Economics.

2.6 The bi-polar nature of teaching aims

The refined formulation of the aim with categorical forming, as explained in the function of **double unlocking**, refers to a polarity between the **unlocking activities** of the teacher and the child (learner). Because of the bi-polar nature of this teaching aim, it is necessary to distinguish between a **lesson** and a **learning aim.**

lesson aim

teaching aim

learning aim

Learning aims

Within each subject (school) curriculum with its cultural aims school syllabi have been compiled in which certain themes are taken up and which is related to a specific "intention" and must be interpreted as such. Each syllabus theme, if reduced correctly, leads to a refined formulation of the learning aim.

In most cases, there are one or more new **concepts** which must be mastered with insight, independently and/or in relationships. Depending on the unique nature of the subject, and the readiness of the class (group, child), then **a level of ability** is posed--a level of proficiency-- which must be reached by each pupil. By delimiting a learning aim around a specific **syllabus theme,** there usually is a search for relevant new concepts, relations, and proficiencies. What proficiencies (general or subject specific) are going to be pursued, and to what level of ability (competence), are matters where philosophy of life, as well as subject-scientific considerations must be balanced.

Lesson aims

Only when the teacher has a clear image (formulation) of the learning aims (especially the hierarchy of operational learning aims) can he/she proceed to look for a particularized teaching aim for a lesson. On the one hand, he/she mudt visualize a fruitful form by

which he/she intends to disclose (optimally unlock) new **learning contents** for a child. On the other hand, it is necessary that an effective **sequence** or successive **operational procedures** (aims of the phases of a lesson) be formulated, by which he/she intends to guide a child.

Thus, a lesson aim embraces two **part-aims**, i.e., designing the **form** (ground form, methodological, and teaching principles, certain teaching activities, etc.), as well as **lesson phase procedures** (foreknowledge, presenting, functionalizing, etc.). Thus, a lesson aim ensures a planned form and sequence of a lesson and avoids haphazard or coincidental guidance and learning.

Consequences of lesson planning

A. Learning aim: self-discovery of an **elemental**
Lesson aim: play as ground form (experiment).

B. Learning aim: representing a **fundamental**
Lesson aim: conversation as ground form (narrate).

2.7 Reducing a syllabus theme and specifying the learning aims

A first reduction already occurs when, from the open, total reality, particular **teaching contents** are formulated and ordered for a school curriculum based on socio-cultural demands, anthropological-existential preconditions, democratic-ideological ideas, stabilized-lasting meanings, structural and general proficiencies, as well as from among relevant alternatives and nuances.

Second, in compliance with the unique nature of a particular school subject, and the preparation and abilities of a particular class, group of pupils of a particular school phase (primary, secondary), a particular school curriculum is compiled existing of several syllabi in which a series of **syllabus themes** are taken up, each with a particularly formulated aim (elemental meaning).

When a teacher prepares a particular lesson, there is a last reduction when he/she proceeds from an implicit or explicit aim to

attribute essential meanings to the contents, to then selecting and ordering in a unique way the particular facts, terms, principles, data, etc. to be unlocked, as well as in what relations (visual, logical, causal, etc.) and on what level of ability (proficiency) he/she intends the class to assimilate them. An inventory of such subject elementals and teaching aims allows a teacher to formulate, within a particular syllabus theme (learning aim), a hierarchy of **operational** learning aims. Beginning with a particular initial situation, and the pupils' level of entry, a specific hierarchy is selected regarding which relevant foreknowledge must be actualized beforehand, and then actualized in a series of procedures (operations) within each aim [of the phases of a lesson].

A hierarchy of learning aims

Because, by nature, the aim is always a theoretical view of a matter (phenomenon), it mostly is general, comprehensive, vague, and has alternatives.

For example, an aim in geography: The **climate** of the Cape. To try to attain this, in designing a lesson (make practical) it is necessary to reduce (re-formulate) it further and formulate some concrete, observable and/or operationalizable aims (refined aims) which must serve as **constituents**. For the above, the following **aims** can be formulated:

some characteristics of the climate
a few typical phenomena of climate
some subject-particular proficiencies

In addition, the following guidelines are important in formulating an aim:

* in the formulation a particular operation (verb) should refer to the expected activities. The more simple and outwardly **observable** the activity, the easier it is to control (verify). For example: write down, name, solve, recognize, compute, draw, order.

* for each operation (doing and/or thinking activity), a **level of ability** (proficiency, technique) must be indicated and selected to be in agreement with the level of the pupils.
name the characteristics ...
explain the climate phenomenon
read a map/table/graph:

* for each operation, a **minimum** level of mastery must be indicated so that a criterion can be defined for the quality of the learning effect.
name **four** characteristics
explain **one** phenomenon

Example in mathematics: the area of a geometric figure is computed (with/without a formula)

* also, to be able to interpret the **functional** relation between the aims (a progression, a generalization, cumulatives, etc.) it is necessary now that the aims are formulated to inventory and classify them, and also place them in a particular order (hierarchy, taxonomy) by which additional attributions of meaning arise.

Example: (a) First the two unconnected concepts **ocean currents** and **mountains** and then the **related** factors of rain fall.

(b) First the **causes** and **effects** of the Great Trek separately and then the **causal** relations between them.

In Bloom's taxonomy of proficiencies (aims) in the cognitive domain, there also is an ordering according to an increasing line of difficulty (abstractness), i.e., knowing, comprehending, implementing, analyzing, synthesizing. and evaluating. "Complete" cognitive forming, therefore, requires that the components be mastered, and in a particular **sequence.**

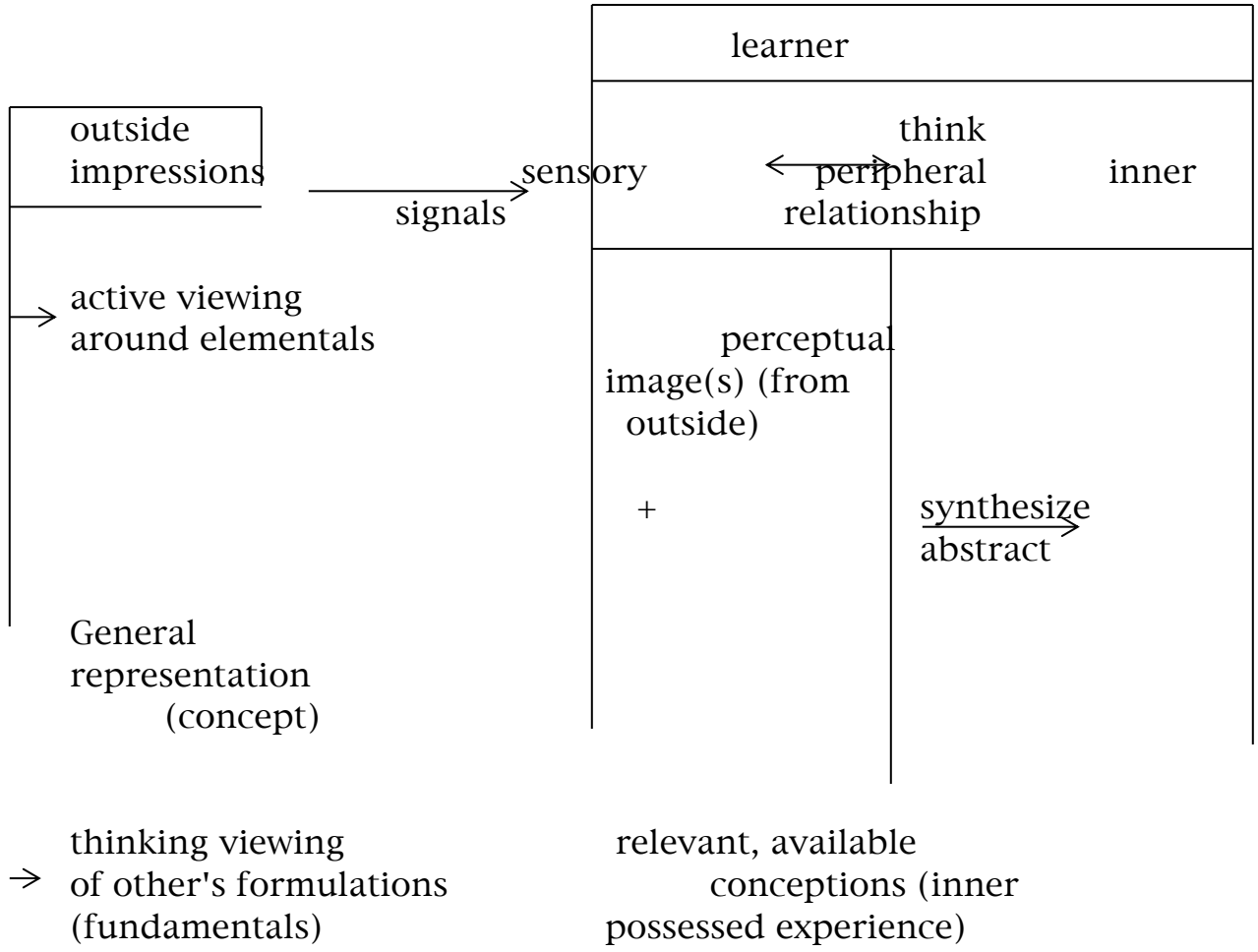
2.8 A subject didactic model of learning

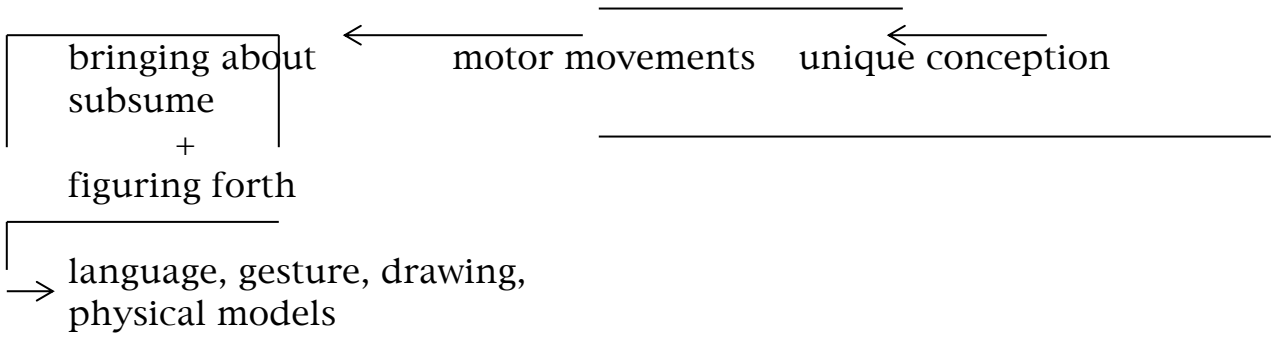
To be able to prepare a teaching plan, it certainly is necessary that there be clarity about everything which is included in the concept

"learning", in general, and "concept formation", in particular. Thus, it has to do with the operations from **receiving an external impression** to and including an **abstract concept** about a phenomenon or idea.

The line which must be followed, then, is from a sensory **impression**, a first **perceptual image,** and a final **concept**, with particular **reciprocal** interactions by which the quality of the conceptualization is influenced by factors such as attitude (disposition), affective lived experiences, earlier cognitive experience, and even creative (ideological) synthesizing (representations)

To illustrate this, the following **theoretical model** is presented on the next page.





D. SUBJECT DIDACTIC RESEARCH

1965 M. Ed. Van Dyk, C. J. **Aspekte van die besondere didaktiek vir die onderrig van Skeikunde op die middelbare skool** [Aspects of particular didactics for teaching Chemistry in the secondary school]

1969 M. Ed. Swart, A. **'n Pedagogiese evaluering van spanorganisasie ("Team Teaching") met besondere verwysing na individualiseringsmoontlikheid** [A pedagogic evaluation of "Team Teaching" with special reference to individualizing possibilities]

1969 D. Ed. Van Dyk, C. J. **Vanaf vorming (Bildung) tot eksemplariese onderrig en leer: 'n didakties-pedagogiese strukturering (Pedagogiekstudies No. 73)** [From forming to exemplary teaching and learning]

1971 M. Ed. Basson, N. J. S. **Leerstofordening in die lessituasie: 'n studie in Fisika-onderrig (Lesstofordeing in die lessituasie** McGraw-Hill) [Ordering learning material in a lesson situation: A study in Physics teaching]

1972 M. Ed. Oosthuizen, W. L. **Die plek en betekenis van leerstofreduksie in die ontwerp van die Wiskundeles (Leerstofreduksie in die Wiskundeles** McGraw-Hill) [The role and

significance of reducing learning material in designing a Mathematics lesson]

1973 M. Ed. Thomas, A. M. L. **Enkele vakdidaktiese uitsprake by die onderrig van Elementere Natuurwetenskap** [Some subject didactic findings about teaching Elementary Natural Science]

1973 M. Ed. Calitz, L. P. **Enkele didaktiese kategoriee en hulle segwaarde by die beplanning van 'n vakdidaktiek: Biologie** [Some didactic categories and their relevance for planning subject matter teaching: Biology]

1975 M. Ed. Human, P. G. **'n Histories- Vergelykende perspektief op Wiskunde-onderrig, met besondere verwysing na doelstellings. (Doelstellings met Wiskunde-onderrig: 'n Histories-vergelykende perspektief** Pedagogiekstudies No. 83**)** [An historical-comparative perspective on teaching Mathematics with particular reference to aims]

1976 D. Ed. Swart, A. **Betekenisontsluiting in die onderrig van die geesteswetenskappe** {The significance of unlocking in teaching the human sciences]

1977 D. Ed. Erasmus, M. M. **Die posisie van die leerling in die junior primere lessituasie** [The position of the pupil in the junior primary lesson situation]

1977 M. Ed. Van Dyk, J. J. **Inhoudsanalise en onderrigsbeplanning in 'n Biologieles van die sekondere-skoolfase** [Content analysis and planning teaching a Biology lesson at the scondary school level]

1978 M. Ed. Van der Merwe, P. J. **Vakdidaktiese beplanning rondom die aanvangsituasie van 'n geskiedenisles** [Subject didactic planning regarding the beginning situation of a History lesson]

1978 M. Ed. Lancaster, M. M. **Die onderrig van Afrikaans (Moedertaal) in die aanvangsklas** [Teaching Afrikaans (First language) in a beginning class]

1979 D. Ed. Basson, N. J. S. **Ontwerp van lesmodaliteite in die Natuurwetenskappe** [Designing lesson modalities in the Natural Sciences]

1979 D. Ed. Oosthuizen, W. L. **Die verantwoordelikheid van die vakdidaktiese teorie (Wiskunde) teenoor die praktyk** [The accountability of subject didactic theory (Mathematics) in practice]

1979 M. Ed. Moller, A. K. **Vormingsaspekte van Aardrykskunde-onderrig** [Formative aspects of teaching Geography]

1979 M. Ed. Schwalb, E. B. **Enkele kundighede, vaardighede en tegnieke in die onderwys van Natuur- en Skeikunde (SeniorSekondere fase)** [Some proficiencies, skills and techniques in teaching Physics and Chemistry (High school level)]

1980 M. Ed. Van Wyk, L. T. **Tekene as daarstellingsvorm in die onderwys van bedryskennis, houtwerk en metaalwerk** [Diagrams as a form of teaching wood work and metal work skills]

1980 M. Ed. du Toit Olivier, C. **'n Analise en klassifikasie van enkele leeroperasies in die onderwys van Biologie in die senior sekondere fase: 'n vakdidaktiese studie** [An analysis and classification of some learning operations in teaching Biology in high school: a subject didactic study]

1980 M. Ed. Stuart, F. **Die relasie tussen die eie aard van die skoolvak geskiedenis as geesteswetenskap en die presisering van leerdoelstellings** [The relationship between the unique nature of the school subject History as a human science and the specification of learing aims]

1980 M. Ed. Van Zyl Burger, I. **'n Terreinverkenning en funksieanalise rondom bestuur met die oog op 'n sinvolle interpretasie van veiligheid opleidingsmodelle** [An exploration and functional analysis of the terrain of administration aimed at a meaningful interpretation of a training model for security]

1980 ----- Van Dyk, C. J. **Navorsingsvooruitgang en die teoretiese model** [Research progress and the theoretical model]

Research Reports

1978 Botha, L. **Ondersoek aangaande sekere kundighede in die onderrig van wiskunde in die sekondere skool** [Research regarding certain proficiencies in teaching mathematics in the secondary school]

1978 **Ondersoek aangaande die doeltreffendheid en verantwoordelikheid van formuleringe binne geskiedenis matrikulasie eksamenvraestelle** [Investigation of the effectiveness and accountability of formulations in history matriculation examination questions]

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