

# TABLE OF CONTENTS

## CHAPTER 1. GENERAL AND PARTICULAR PROBLEMS IN TEACHING MATHEMATICS

### 1.1 INTRODUCTION

### 1.2 GENERAL PROBLEMS

### 1.3 SPECIFIC PROBLEMS

#### 1.3.1 Problems with the beginning of the lesson

- a) Problems with the lesson beginning
  - Problems with the child
  - Problems with the learning material
- b) Problems with stating the problem
  - Lived-experiencing the problem
  - Giving meaning
  - Motivating
  - Own problem
  - Searching for a solution himself

#### 1.3.2 Problems (methods) with offering the new contents

- a) The problem of mechanical imitation
- b) The problem of premature generalization

#### 1.3.3 Problems with controlling (checking) the new

#### 1.3.4 Problems of application

#### 1.3.5 Problems of evaluation

### 1.4 SUMMARY

## CHAPTER 2. THEORETICAL PENETRATION OF THE CONCEPT “REDUCTION OF LEARNING MATERIAL”

### 2.1 INTRODUCTION

### 2.2 WHAT IS LEARNING MATERIAL?

### 2.3 THE CHOICE OF LEARNING MATERIAL

### 2.4 WHAT IS REDUCTION?

### 2.5 THE PHENOMENOLOGICAL METHOD

### 2.6 HUSSERL AND THE CONCEPT “REDUCTION”

- a) Eidetic reduction
- b) Phenomenological reduction
- c) Transcendental reduction

### 2.7 SUMMARY OF HUSSERL’S PRONOUNCEMENTS

### 2.8 PRONOUNCEMENTS OF MARTIN HEIDEGGER

- a) An intrinsic, inner concealment
- b) A covered concealment
- c) A deliberately altered concealment

### 2.9 SUMMARY

### 2.10 THE STEPS OF THE REDUCTION AS PROPOSED BY SPIEGELBERG

#### 2.10.1 Disclosing particular phenomena

- a) The intuitive operation
- b) The analytic operation
- c) The descriptive operation

#### 2.10.2 Disclosing general essences (eidetic reduction)

#### 2.10.3 Disclosing relations among the relevant essences

- 2.10.4 Disclosing the ways (modes) the phenomenon shows itself
- 2.10.5 Disclosing the constitution of phenomena in consciousness
- 2.10.6 All foreknowledge regarding the phenomenon must provisionally be suspended
- 2.10.7 The meaning of the phenomenon must be interpreted
- 2.11 **THE DIDACTIC CATEGORY “REDUCTION”**
  - a) What is a didactic category?
  - b) The meaning of the didactic category “reduction” for practice
- 2.12 **REDUCTION OF LEARNING MATERIAL IN GENERAL**

## **CHAPTER 3. THE PLACE AND MEANING OF REDUCING THE LEARNING MATERIAL IN THE LESSON STRUCTURE**

### **3.1 INTRODUCTION**

### **3.2 THE TEACHING AIM AND REDUCING THE LEARNING MATERIAL**

#### 3.2.1 General

#### 3.2.2 The teaching aim and the “what” of teaching

#### 3.2.3 Important aspects of the teaching aim

- a) The syllabus theme (its formative quality) and reducing the learning material
- b) Lesson aim and reducing the learning material
- c) The learning aim, stating the problem and reducing the learning material
- d) Formulating the problem and reducing the learning material
- e) The choice of example and reducing the learning material
  - The example and the unique nature of the subject matter
  - The example and the method
  - The example and meaningful relationships
  - The example and the readiness of the child

### **3.3 THE COURSE OF THE LESSON AND REDUCING THE LEARNING MATERIAL**

#### 3.3.1 Actualizing foreknowledge

- a) What is actualizing?
- b) What is foreknowledge?
- c) Actualizing foreknowledge and the preparation by the teacher
- d) Actualizing foreknowledge and the choice of a lesson form
- e) Actualizing foreknowledge and the choice of certain didactic principles

#### 3.3.2 Stating and formulating the problem

#### 3.3.3 Exposing the new

- a) What is exposition?
- b) Exposition and examples

#### 3.3.4 Actualizing the learning content

- a) Reviewing the essences
- b) Practicing *to* insight
- c) Naming and schematizing

#### 3.3.5 Functionalizing as a moment of the course of the lesson

- a) What is functionalizing?
- b) Practicing *of* insight as a moment of functionalizing
- c) Integration as a further moment of functionalizing
- d) Applications and functionalizing

#### 3.3.6 Evaluating

- a) What is evaluating?
- b) The aim of evaluating
- c) The necessity of evaluation

### **3.4 SUMMARY**

**CHAPTER 4. PRACTICAL EXAMPLES TO ILLUSTRATE THE SENSE AND MEANING OF REDUCING THE LEARNING MATERIAL FOR CONSTRUCTING A MATHEMATICS LESSON STRUCTURE**

**4.1 INTRODUCTION**

**4.2 AN EXAMPLE FOR EACH PHASE OF THE LESSON STRUCTURE**

- 4.2.1 The learning aim and reducing the learning material
- 4.2.2 The lesson aim and reducing the learning material
- 4.2.3 Actualizing foreknowledge and reducing the learning material
- 4.2.4 Stating and formulating the problem and reducing the learning material
- 4.2.5 Exposing the new and reducing the learning material
- 4.2.6 Controlling the new and reducing the learning material
- 4.2.7 Functionalizing the new insights and reducing the learning material
- 4.2.8 Evaluating and reducing the learning material
- 4.2.9 Summary

**4.3 AN EXAMPLE OF A COMPLETE LESSON STRUCTURE**

**BIBLIOGRAPHY**