

# *Instructional Design Models*

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People who have enjoyed regular education often remember how the way that teachers modeled their instruction helped learning and understanding the world.

Leading questions:

→ **what**

→ **whom**

→ why

→ which purpose

→ **how**

→ when

→ where

Different labels are used to denote the field.

The label *teaching/instructional methods* is mainly used in English-speaking parts of the world ...

... whereas the label *didactics* is dominant in European countries.

In the last 60 years the label *instructional design (ID)* became established almost all over the world.

Zierer, K., & Seel, N.M. (2012). General didactics and instructional design: eyes like twins. A transatlantic dialogue about similarities and differences, about the past and future of two sciences of learning and teaching. *SpringerPlus* 2012, **1**:15.

(highly accessed)

The label ID covers a broad range of activities that are usually summarized into

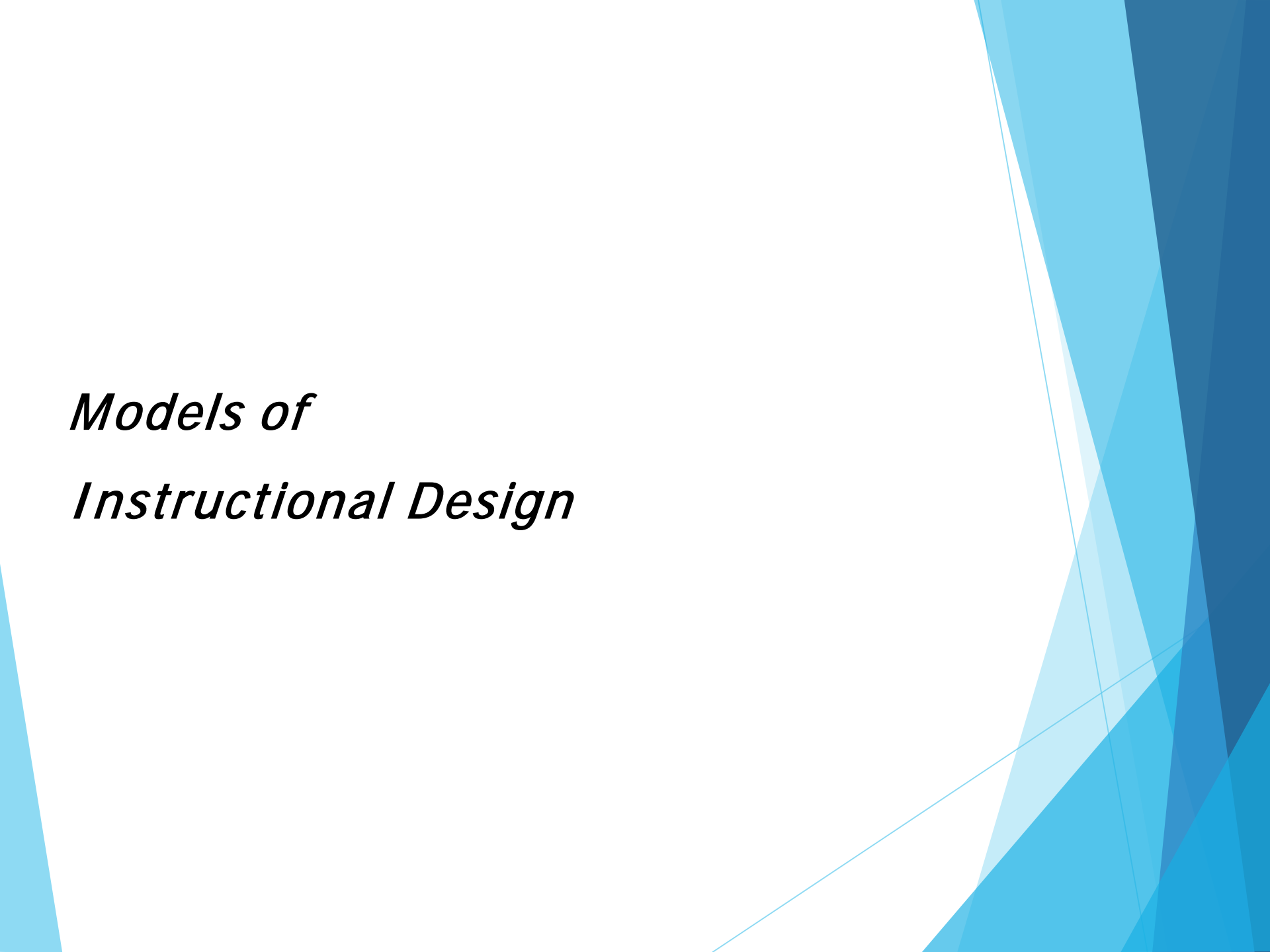
- **Needs assessment** aiming at the specification of which knowledge and skills students should acquire,
- the **design of instructional programs** (e.g. lectures),
- the **development of learning materials** and delivery systems as well as the construction of learning tasks,
- the **implementation** of programs,
- the **evaluation** of the outcomes and outputs.



*The field of instructional design and technology encompasses the **analysis** of learning and performance problems, and the **design, development, implementation, evaluation** (→ **ADDIE**)*

*and management of instructional and non-instructional processes and resources intended to improve learning and performance in a variety of settings, particularly educational institutions and the workplace*

(Reiser, 2001, p. 57).

The background features abstract, overlapping geometric shapes in various shades of blue, ranging from light sky blue to deep navy blue. These shapes are primarily located on the right side of the frame, creating a modern, dynamic feel. The text is positioned on the left side of the white background.

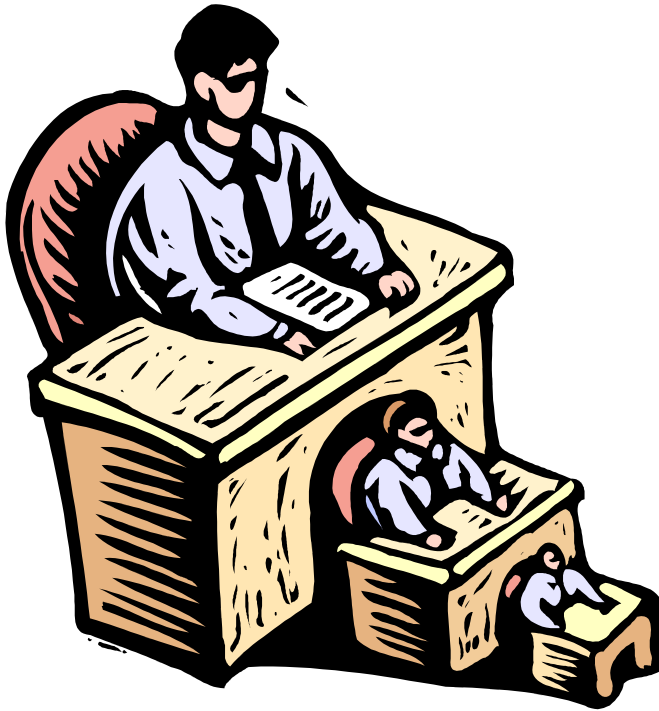
*Models of  
Instructional Design*

*„Models ... shape the consciousness of those who use them“*

**(Ryder, 2003, p.1).**



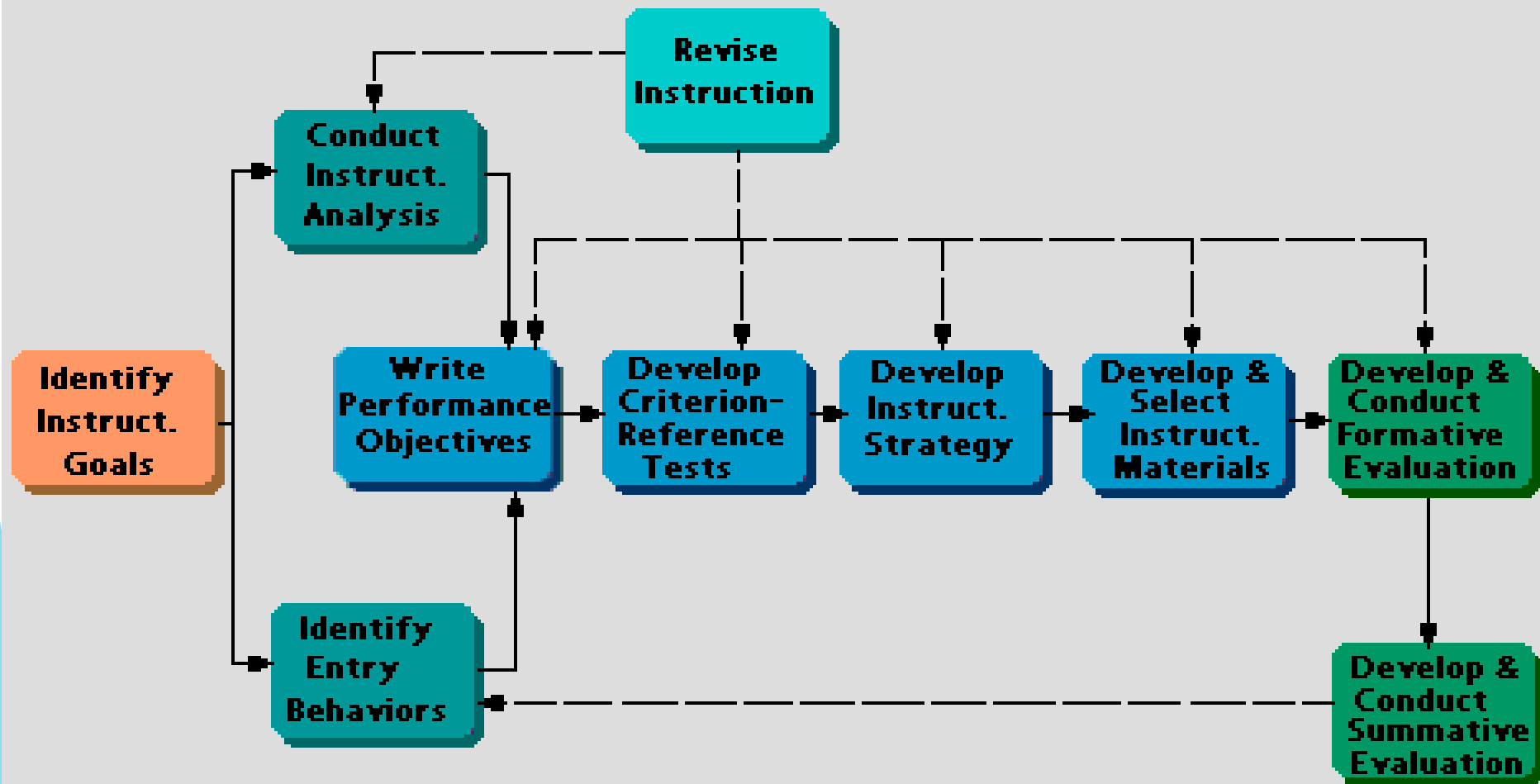
## The generations of ID-Models:



1. Prescriptive **procedural models** in accordance with Gagné:
  - \* Dick-and-Carey-Modell
  - \* Component Display Theory (Merrill)
  - \* Elaboration Theory (Reigeluth)etc.
  - \* Cognitive Load Theory
2. **AID-models** (Goal: Automatisations of instructional planning):
  - \* ID-Expert
  - \* GAIDA, XAIDA
  - \* Softbuilder
3. **Research-based models**
  - \* Anchored Instruction
  - \* Model-Centered Learning and Instruction

# Prescriptive models

## Dick and Carey Design Model



# Prescriptive models

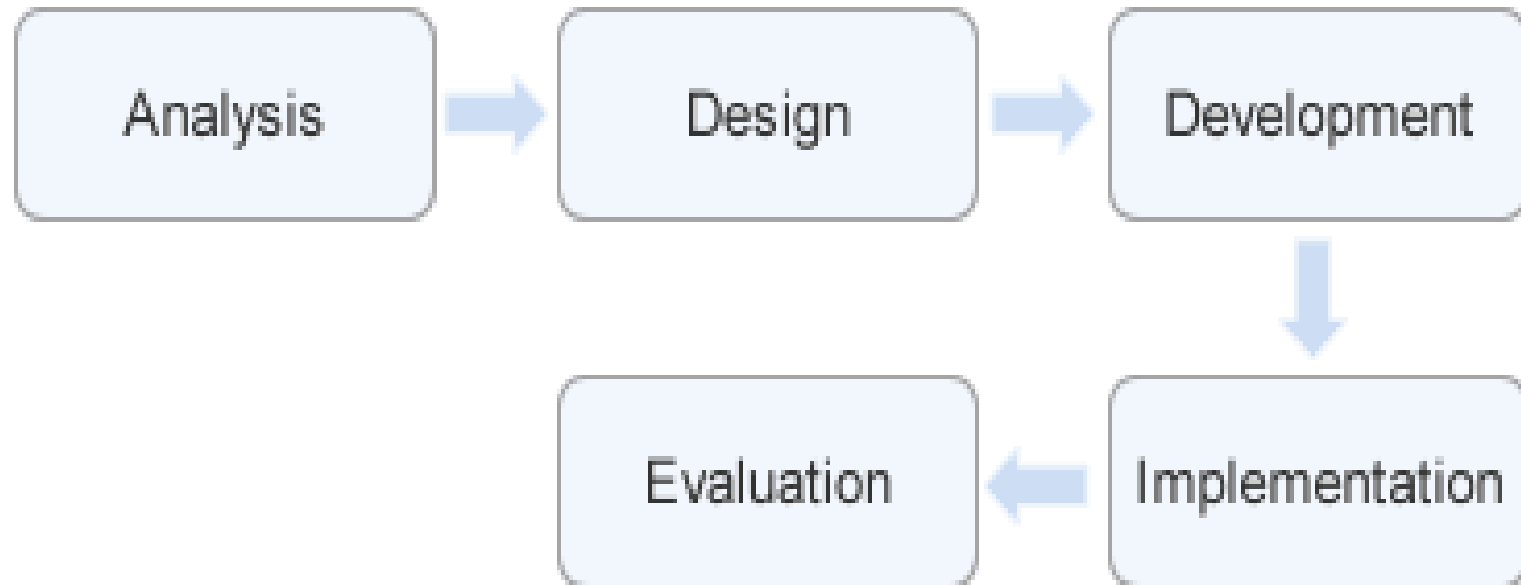
Dick and Carey (1996) summarize the characteristics of their model:

**Goal-directed:** all the components in the system work together toward a defined goal.

**Interdependencies:** all the components in the system depend on each other for input and output.

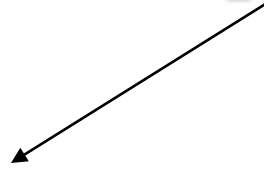
**Feedback mechanism:** the entire system uses feedback to determine whether the goal is met.

**Self-regulating:** The system will be modified until the desired goal is reached.



The ADDIE Instructional Design Model

# ***ADDIE***



## ***1. Analysis***



### **Needs analysis**

Specification of goals and objectives

→ Performance analysis

Analysis of the addressees

Task analysis

Cost-utility-analysis

# ***ADDIE***



## *2. Design*



### **Production of a blueprint**

Storyboard

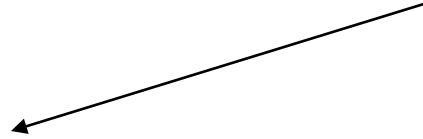
Flow chart

Interface

Learning tasks

Sequencing

# ***ADDIE***



## ***3. Development***



### **Construction of a „working model“**

Specification of the blueprint:

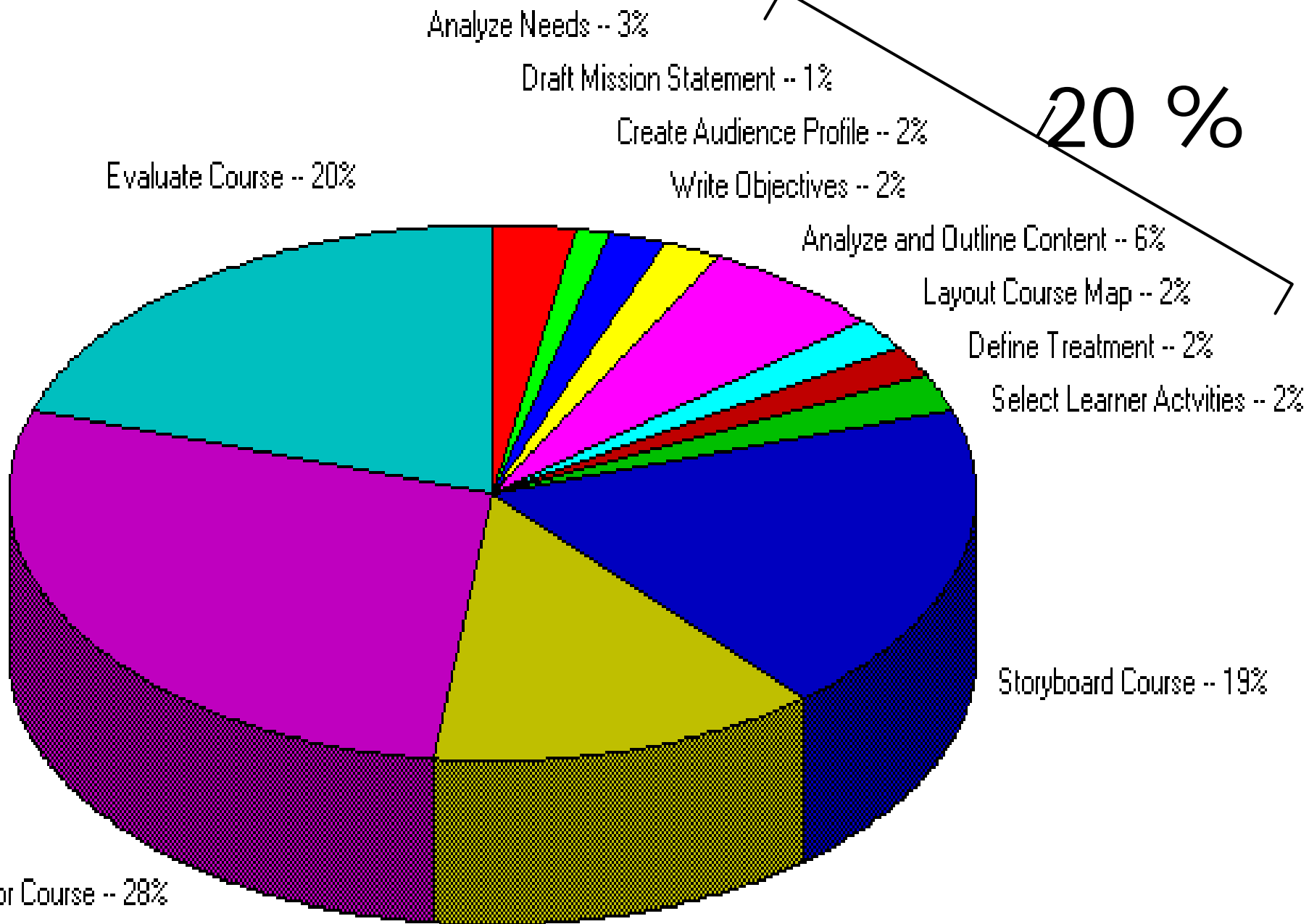
Text Design

Graphic Design

Media Design

.....





*Percentages of time spent in instructional development for a large project consisting of 21 courses developed for the United States Air Force*

Dozens of prescriptive ID-models have been developed and intensely used .... especially for designing instruction in the field of training in business and industry.

However, the prescriptive ID-models have been criticized again and again ...

up to the point that Gordon and Zenke (2000) maintained that *ID in its current form is as good as dead*

because its foundation is not suitable for facing new societal and technological demands.

Gordon and Zemke argued that education and trainings must accommodate a diverse, widely distributed set of students

who need to learn and transfer complex cognitive skills to an increasingly varied set of real-world contexts and settings.

Several novel models of ID want to correspond with this verdict ... for example

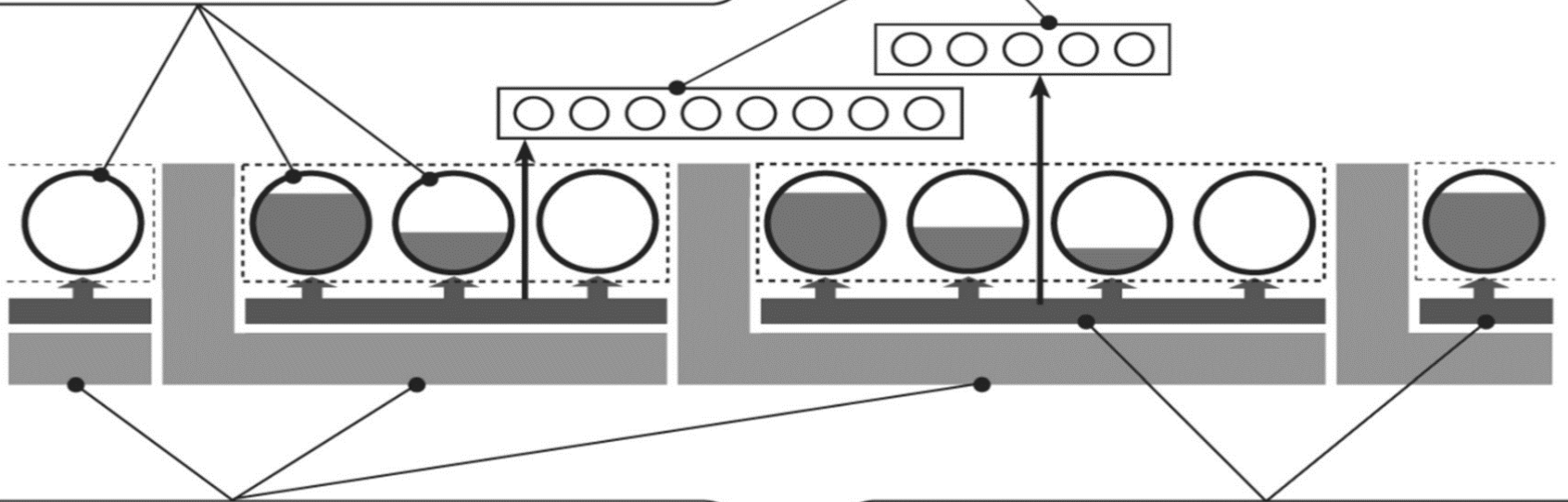
- The 4C/ID model (van Merriënboer)
- MOMBI: Model of Model-Based Instruction (Hanke, Seel)

## Learning tasks

- concrete, authentic whole-task experiences
- organized in simple-to-complex task classes, i.e., categories of equivalent learning tasks
- learning tasks within the same task class start with high build-in learner support, which disappears at the end of the task class (i.e., a process of “scaffolding”).
- learning tasks within the same task class show high variability

## Part-task practice

- provides additional practice for selected recurrent constituent skill in order to reach required level of automaticity
- organized in part-task practice sessions, which are best intermixed with learning tasks
- snowballing and REP-sequences might be applied for complex rule sets
- practice items are divergent for all situations that underlying rules can deal with



## Supportive information

- supports the learning and performance of non-recurrent aspects of learning tasks
- consists of mental models, cognitive strategies and cognitive feedback
- is specified per task class
- is always available to the learners

## JIT information

- prerequisite to the learning and performance of recurrent aspects of learning tasks or practice items
- consists of information displays, demonstrations and instances and corrective feedback
- is specified per recurrent constituent skill
- presented when needed and quickly fades away as learners acquire expertise

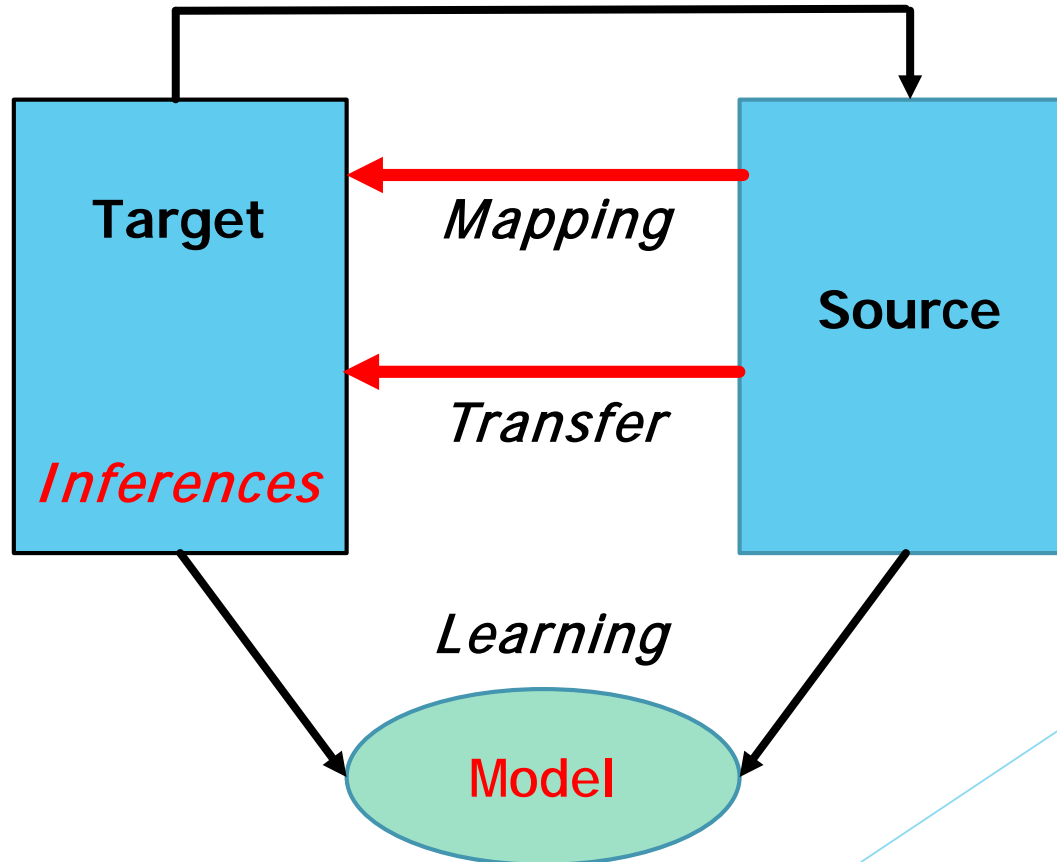
# Model-Centered Learning and Instruction (MCLI)

Grounds on the theory of mental models and investigates how the construction and revision of „internal“ models can be externally (by means of instruction) initiated and facilitated.



## Different ways to come to mental models:

- (1) Models are constructed on the basis of inductive reasoning, i.e. by means of the analogy from the known to the unknown;



**(2) Models ground on the observation and adaptation of other people's behavior or cultural models;**





(3) Models are constructed on the basis of explanations of other people.



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"WE COLLABORATE. I'M AN EXPERT BUT NOT AN AUTHORITY, AND DR. GELPIS IS AN AUTHORITY, BUT NOT AN EXPERT."

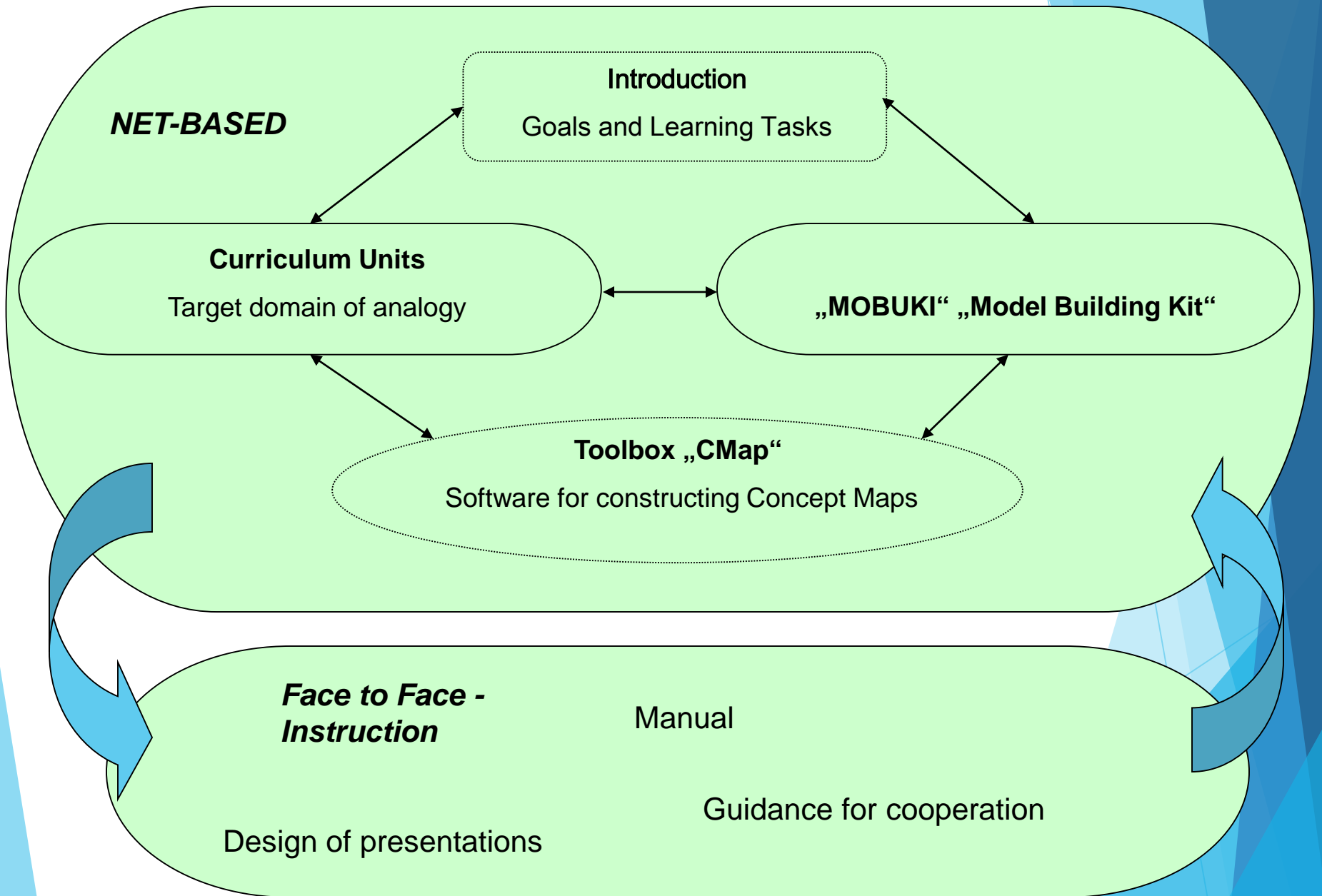
## *Modell-based Discovery Learning*

Hybrid learning environments offer opportunities for reflective thinking and intend to enable the learners to construct mental models (and external representations of them) in order to solve problems.

*„Learning by Design“*



# Lernumgebung „Ökosystem Wald“



# MoBuKi

## Model Building Kit

### Modelle bauen

- >Suchen|
- >Prüfen|
- >Verstehen|
- >Vergleichen|



- Bereich
- Wissen
- Vorgehen
- Beispiel

- Hauptauswahl
- Ich bin fertig!
- Einführung
- Beispielbibliothek

# MoBuKi

## Model Building Kit

### Verstehen

Mentale Repräsentation des Zieles: Der Analogiebildende wird sich zunächst das Ziel und die Merkmale des Zielbereichs vergegenwärtigen (z.B. die Aufgabenstellung in einer Problemsituation). Qualität und Umfang der mentalen Repräsentation werden dabei von dem verfügbaren Vorwissen beeinflusst.

**Zu diesem Thema hätte ich gerne**



einen Text



ein Bild



einen Vortrag

**Zurück**



Scaffolding von Verstehen.

-  >Prüfen|
-  Suchen|
-  >Verstehen|
-  >Vergleichen|

Bereic

Wisse

Vorgeh

Beispi

-  Hauptauswahl
-  Ich bin fertig!
-  Einführung
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# MoBuKi

## Model Building Kit



>Prüfen|



Suchen|



>Verstehen|

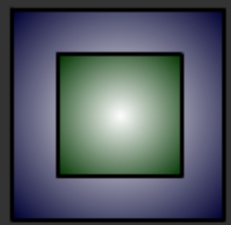


>Vergleichen|

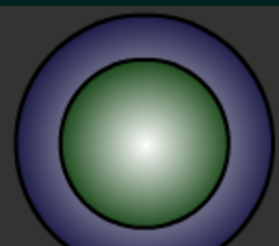
### Vergleichen

In diesem Teilschritt wird überprüft, ob der Basisbereich neben den bisher evidenten Gemeinsamkeiten mit dem Zielbereich noch weitere Übereinstimmungen aufweist. Vor allem Merkmale, die über die Zielrepräsentation hinausweisen, dienen als Ansatzpunkte für die Erzeugung einer Analogie.

#### Zu diesem Thema hätte ich gerne



einen Text



ein Bild



einen Vortrag

Zurück



Hauptauswahl

Ich bin fertig!

Einführung

Beispielbibliothek

Bereic

Wisse

Vorgeh

Beispi

# The future of ID - Is there a future?

My points of consideration:

1. There is a need of progressing toward a theory of instructional design,
2. Future developments of ID models should focus on the creativity of designing.



Surprisingly, after 60 years there is no comprehensive theory of ID but rather a big number of diverse models.

It is certainly true that constructing a theory (that serves both explanation and discovery) is a slow process that more often proceeds step-by-step by accretion and tuning than by sudden decisive changes and shifts of paradigms.

*It's a dirty job but someone's gotta do it.*

# Creativity and design



Traditional models of ID ignore the importance of creativity in instructional design.

There is a need for the connection between creativity and instructional design to be formally conceptualized, included routinely in the discourse of our field, and incorporated into the training of new instructional designers.

*Creativity is understood to be the generation of ideas that are both novel and useful, usually in response to a problem that needs to be solved (Csikszentmihalyi 1996; and many others).*

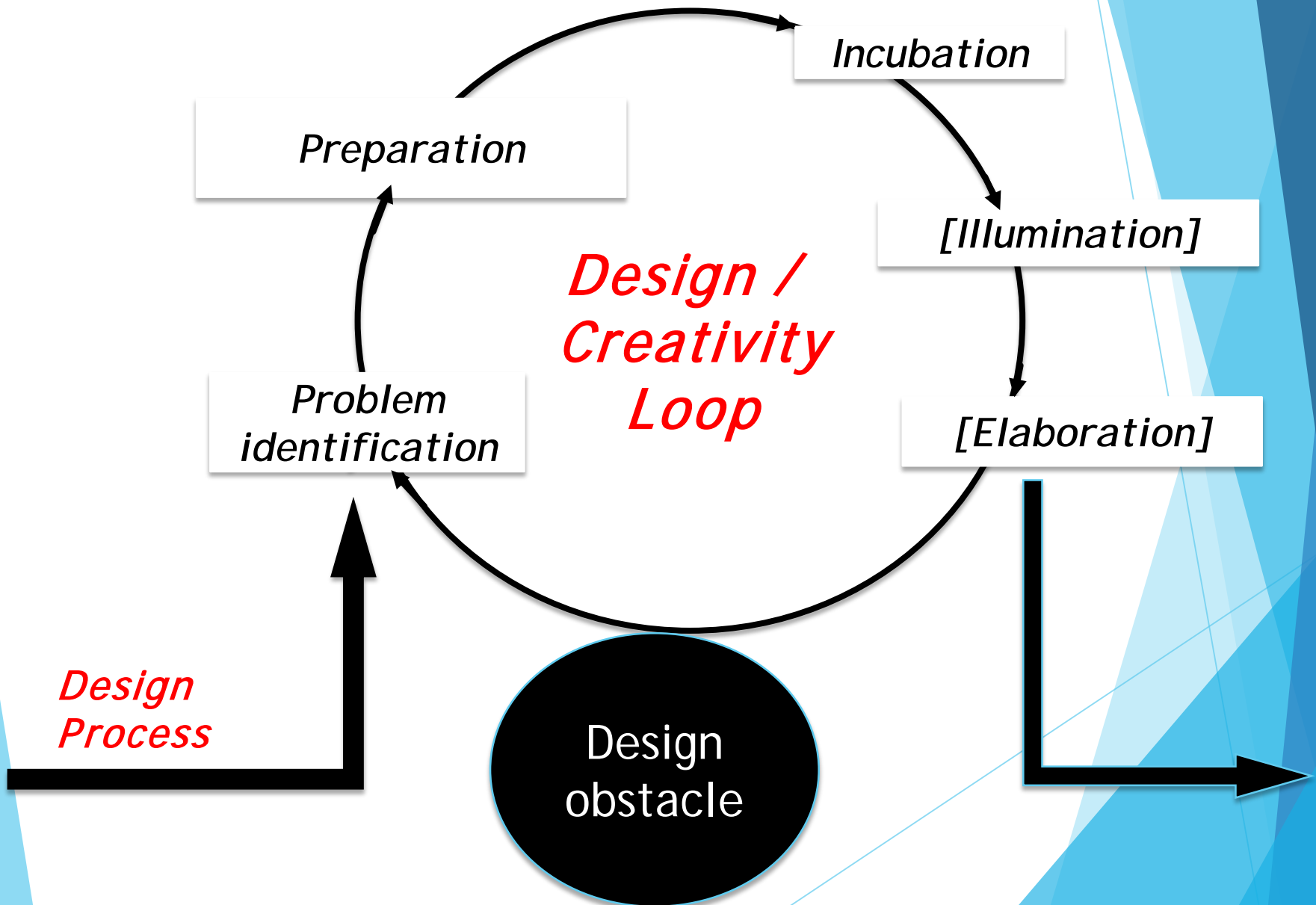
A review of 70 creativity training studies by Scott et al. (2004) presents a positive view of improving creative output.

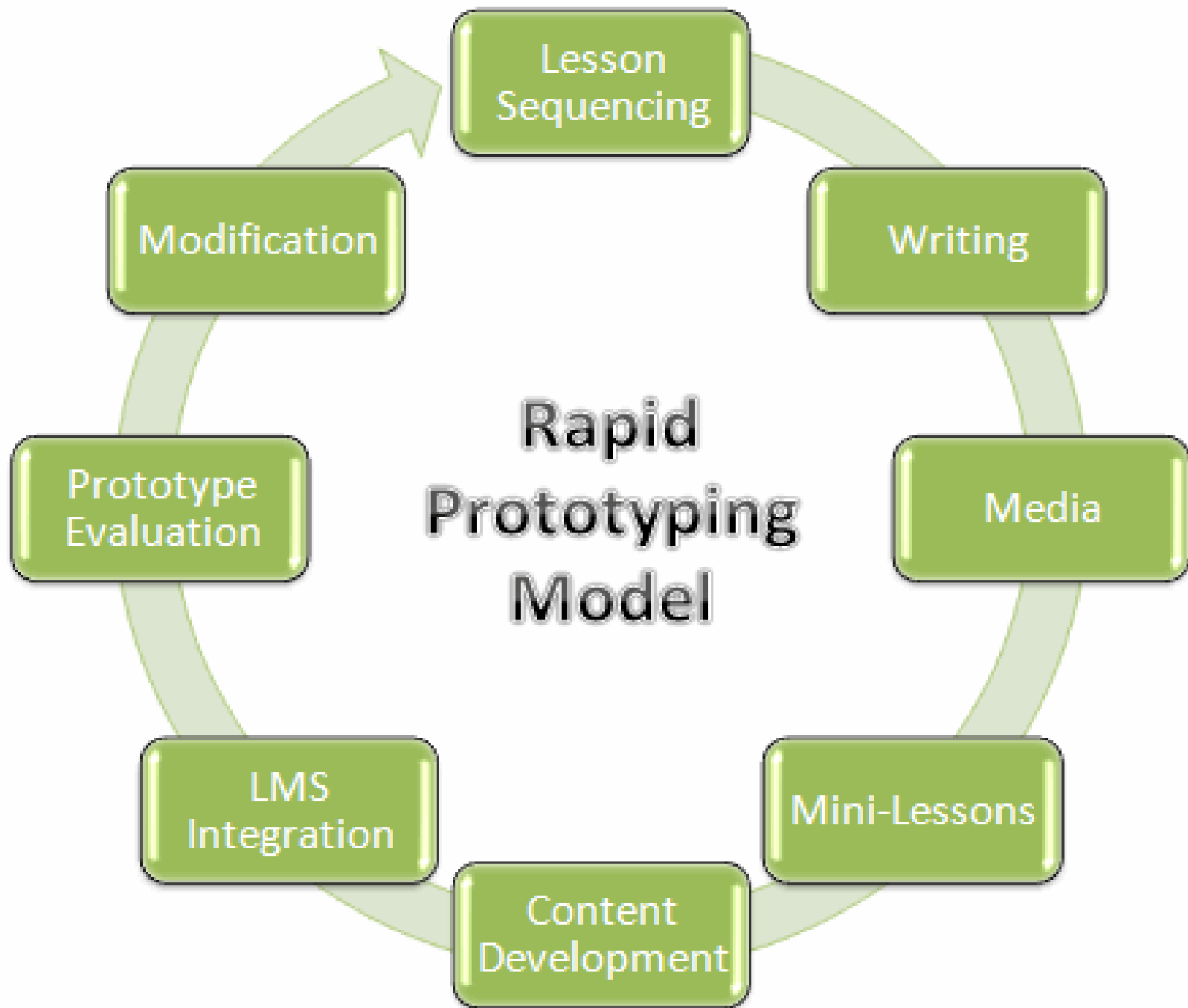
The studies measured results in terms of divergent thinking, problem solving, performance, and/or attitude and behavior.

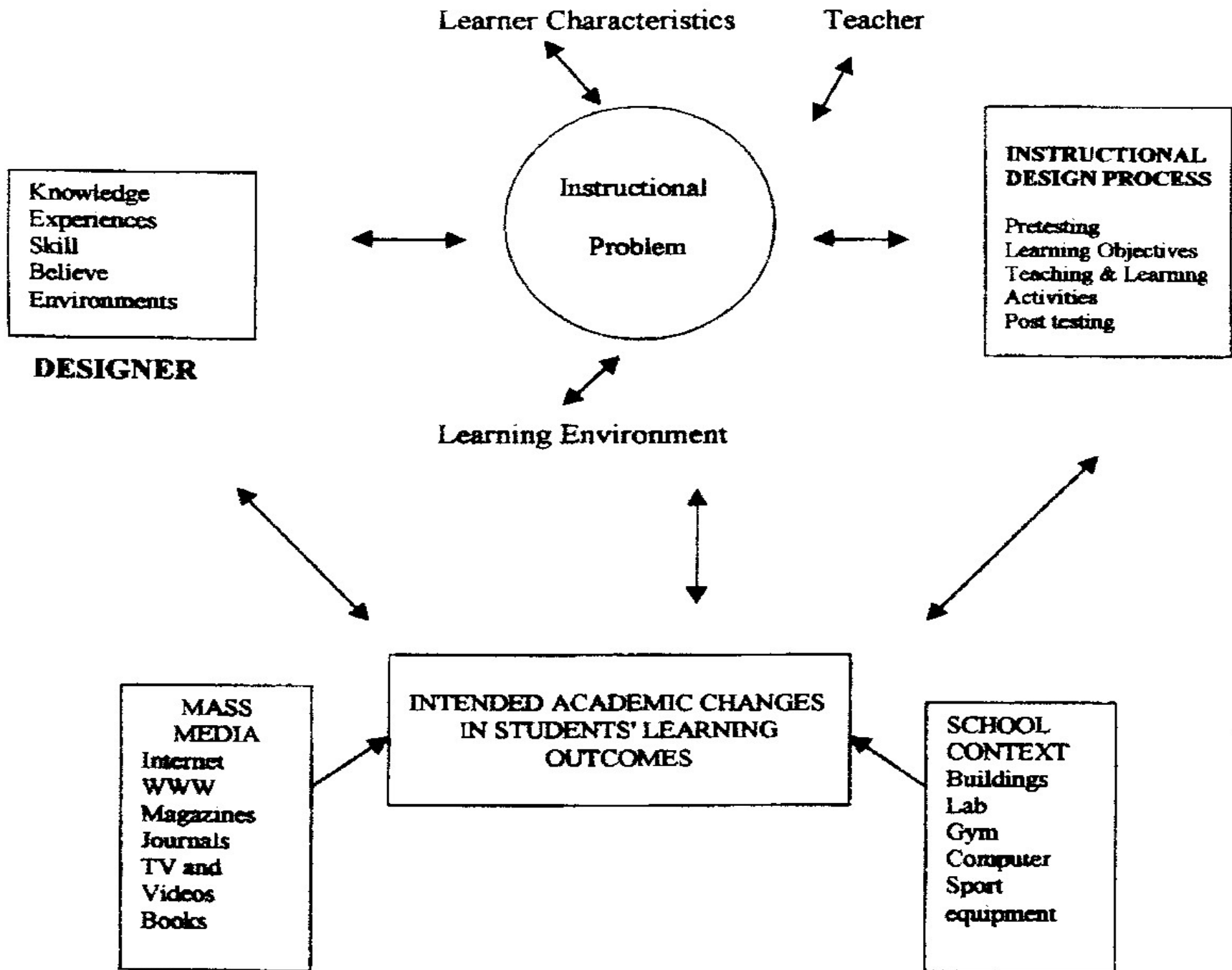
The authors found that “well-designed creativity training programs typically induce gains in performance with these effects generalizing across criteria, settings, and target populations” (p. 361).

# Design/Creativity Loop

(Clinton & Hokanson, 2011)







Analyze Needs




**Analyze Needs**




**Draft Mission Statement**




**Create Audience Profile**



**Write Objectives**



**Analyze & Outline Content**



**Layout Course Map**

Completed

Completed

Completed

Completed

Completed

Completed



**Define Treatment**



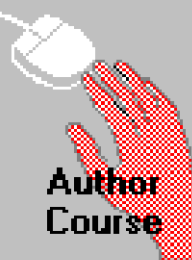
**Select Learner Activities**



**Storyboard Course**



**Produce Media**



**Author Course**



**Evaluate Course**

Completed

Completed

Completed

Completed

Completed

Completed

**Forms**  
 **Edit**  
 **Edit**  
 **Report**  
 **Edit**

- Gather Information and Collect Data
- Identify Needs
- Write and Prioritize Instructional Goals
- Write Needs Analysis Report
- Gain Approval



Thanks for Attention

