Fashion DIET

Research-Based Learning in the Context of Textile Education

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ТРАКИЙСКИ УНИВЕРСИТЕТ
СТАРА ЗАГОРА

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Learning Objectives

After this lecture you should be able to:

- Demonstrate both basic and in-depth knowledge in the field of research-based learning.
- Illustrate central terms used in and around research-based learning as well as didactic and methodical approaches.
- Present and discuss fundamental theories and concepts of research-based learning.
- Link your knowledge of the textile and clothing industry and the textile value chain to research-based learning as a didactical and methodical concept.
- Apply research-based learning in your field of study.

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Why should we professionalise our higher education didactics?

- It is not enough to simply be able to follow implicit rule knowledge without comprehension. Educators must be able to reconstruct and reflexively evaluate how they act in order to be able to construct their actions over and over again (Helsper, 2002, p. 69).
- Professionalisation is seen as (re)learning, or the formation of new patterns of interpretation (Gottuck et al., 2019, p. 12).
- The aim is to transform implicit knowledge into explicit knowledge (Helsper, 2002) and vice versa.
- The aim is to practise new ways of seeing things and new ways of acting:
  - self-reflection and self-observation
  - gender competence and ethnographic competence
- The aim is to sharpen the "pedagogical view" (Schmidt, Schulz & Graßhoff, 2016) as a connection between perception, interpretation, understanding and designs for action.

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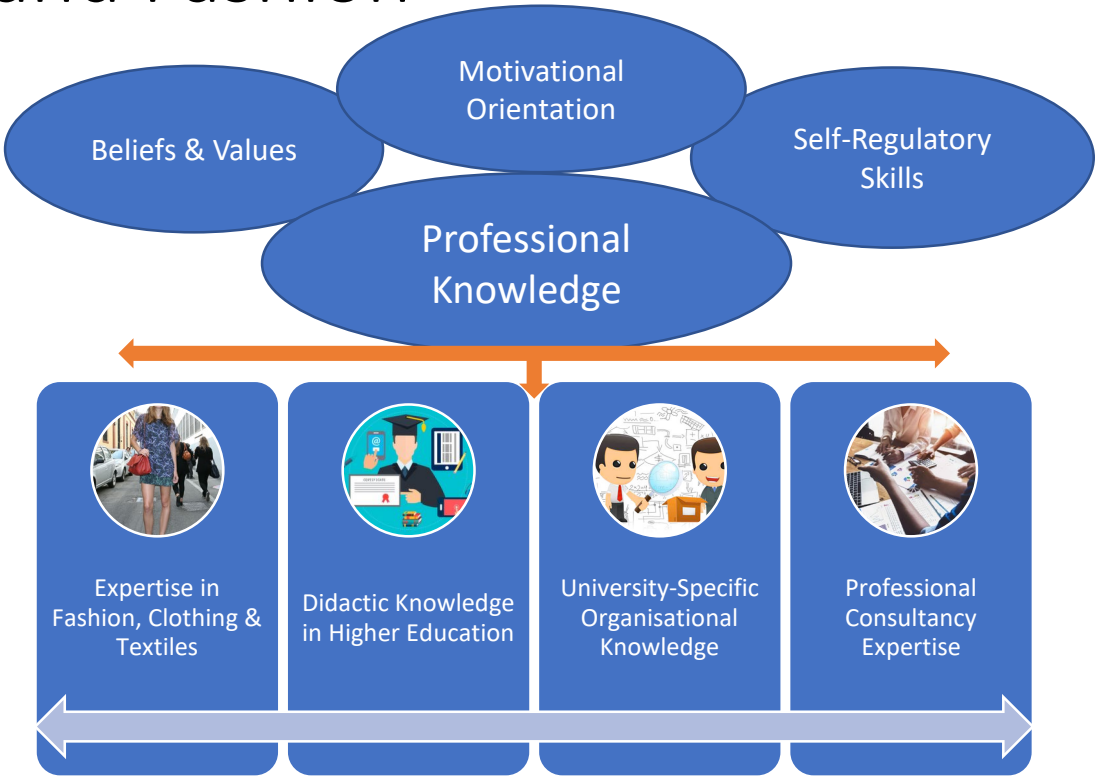
Professional Competence of Lecturers for Textiles and Fashion



Modified from Baumert & Kunter, 2006, p. 482

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Definition of Research-Based Learning

- Research-based learning is a variant of problem-based learning. Accordingly, it is based on the principles of the problem-based learning approach.
- Problem-based learning is characterised by dealing with complex problems (Savery, 2015, p. 7). These are taken from the professional field and research practice and form the starting and reference point of teaching and learning.
- On the one hand, the problems serve as a cognitive and motivational stimulus for the learning process, and on the other hand, they function as a connecting element between scientific theory and the students' future professional activities.

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Definition of Research-Based Learning

- The aim is to develop and practically implement concrete proposals for solving problems by applying their acquired knowledge, skills and abilities.
- The university didactic concept of research-based learning focuses on the scientific examination of “real” problems from the professional fields.
- The second variant of problem-based learning is service learning based on the position of Dewey (1915; 1966). Here, the main focus is on the social engagement of the students and a critical-reflexive processing of practical problems (Bartsch, 2009; Schlicht & Slepcevic-Zach, 2017).

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Development of Research-Based Learning

- Aspects of research-based learning have been discussed since the 1970s with the aim of enabling students to actively participate in the cognitive process and in the realisation of potential research tasks (Bundesassistentenkonferenz, 2009).
- Today, research-based learning is integrated into many guiding principles of colleges and universities as a potential feature of quality (Kergel & Heidkamp, 2018, p. 488).
- Research-based learning is used in higher education institutions and schools. In the school context the terms “research-based learning”, “discovery-based learning” and “inquiry-based learning” are used.

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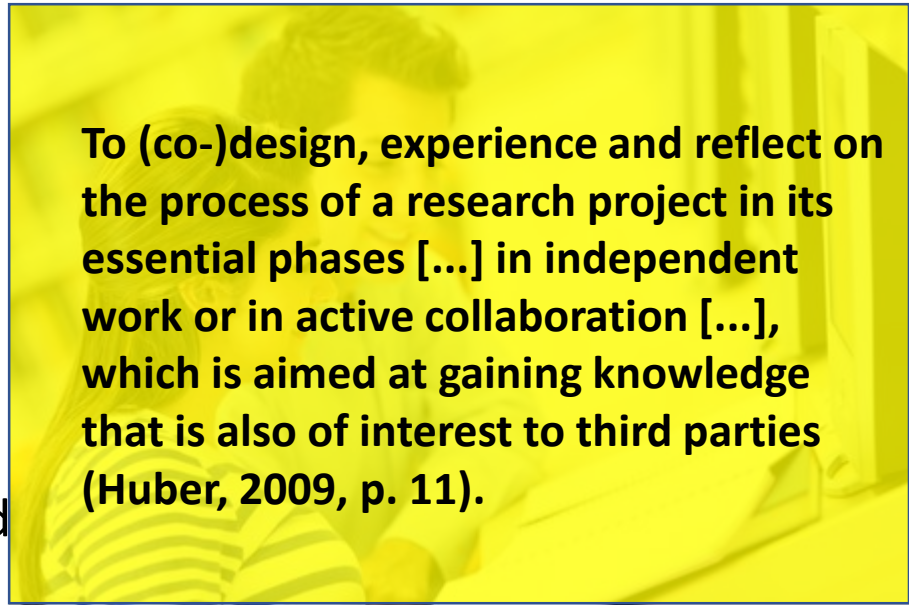
About the Term “Research-Based Learning”

Research-based learning is described as a process controlled by students and accompanied by lecturers,

- in order to work out a question that is relevant to the respective subject matter,
- to plan its answer according to scientific criteria and methods,
- to carry out the research project and to reflect on and account for the process in an appropriate manner.



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Characteristics of Research-Based Learning

- Independent choice of topic or research question
- Independent choice of research design
- Risk of errors, detours and unexpected (side) incidents
- Necessity to meet scientific standards
- Method-dependent testing of results against the background of hypotheses
- Valid and comprehensible results and reflection of the research methods against the background of the research question

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Why Implement Research-Based Learning?

- Promotion of research competence: These are fundamental research attitudes, subject-specific research skills, metacognitive knowledge and skills such as critical thinking and the ability to make abstractions. Students can build their professional identity through these skills.
- Motivation and in-depth learning: By immersing students in authentic research situations, they potentially develop scientific interests. They also acquire the principles of a subject discipline by structuring and reflecting on a research process themselves.
- Social learning: In research groups, communication, organisational and teamwork skills are developed, as well as other interdisciplinary competences that contribute to professional qualifications (e-teaching.org, 2020).

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Research-Based Learning as a Teaching-Learning Structure

In summary, research-based learning proves to be a particularly productive teaching-learning structure for familiarising students with research references and a research-based attitude on the one hand, while at the same time providing them with professional field knowledge as well as subject-specific, personal and social competences for later employment on the other hand. The teaching-learning structure of research-based learning has particular strengths for promoting the practical relevance of studies and the employability of students (Schubarth & Speck, 2014, p. 78, cited in Tremp, 2020, p. 262).

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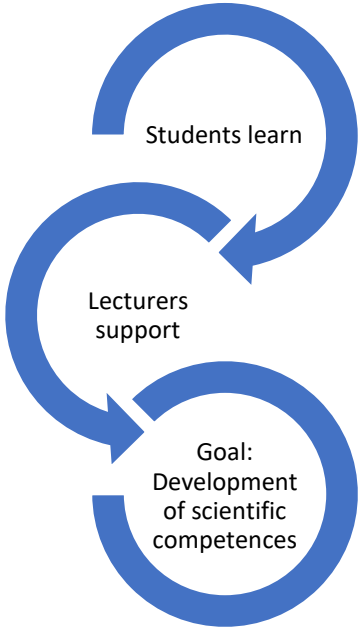
Research-Based Learning as a Didactic Concept

- Guiding question: How do teachers support students in developing their competences?
- Higher education teaching: development of academic competences
- Scientific competences:
  - scientific understanding of and in scientific disciplines
  - scientific action in the discipline: critically evaluating, applying, doing research



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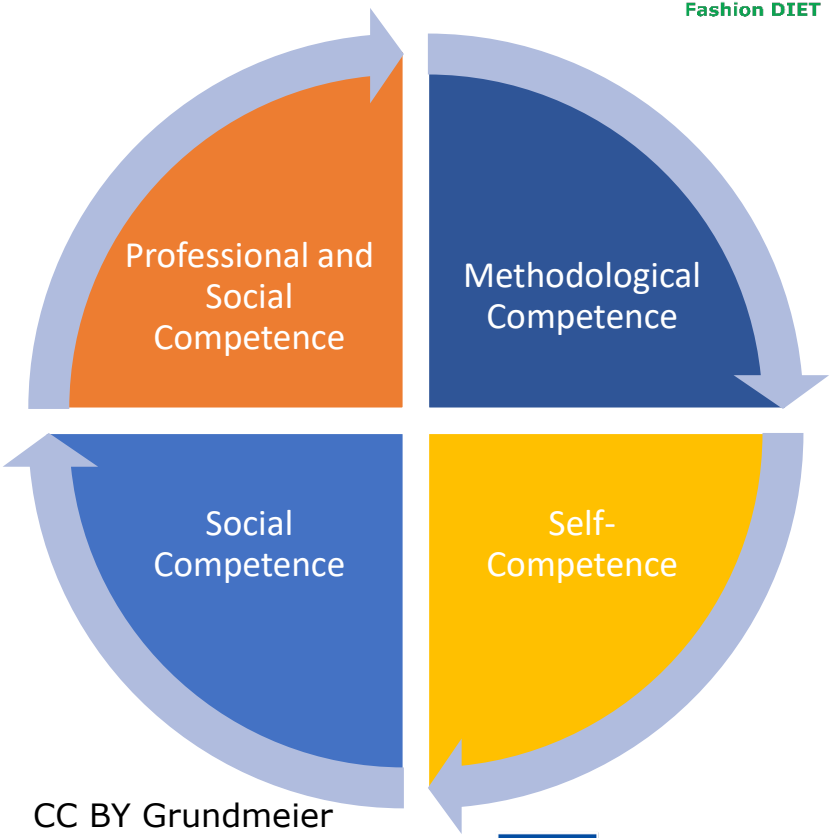
Competence Development through Research-Based Learning

- Student-Centredness (Wulf, 2017):
- Connecting new experiences with already established constructs.
- Each learner must (re)construct his or her knowledge.
- Own interests and prior knowledge determine learning.
- Relationships are core components of learning processes.



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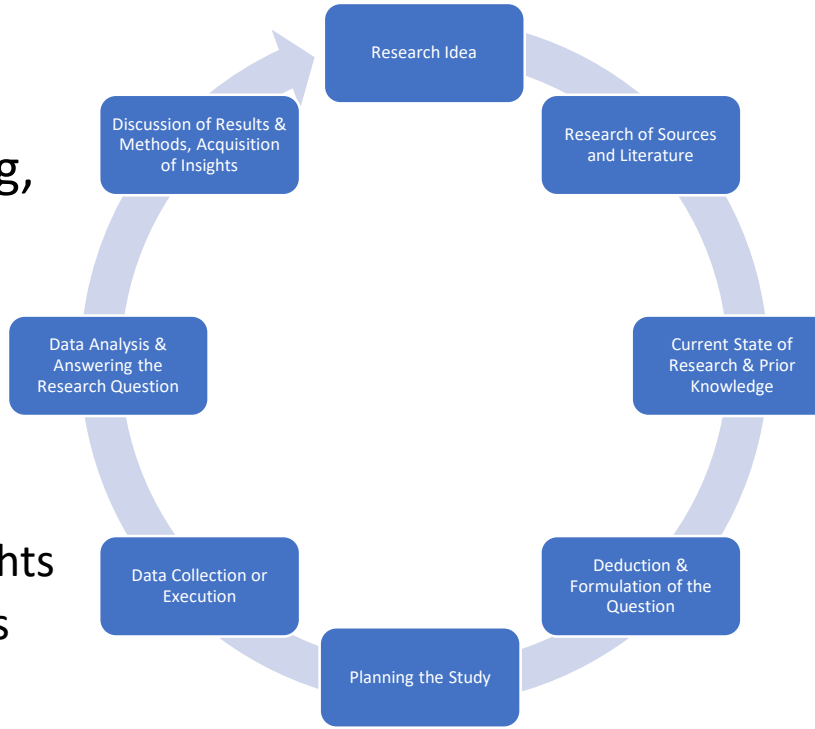
Requirements for Research-Based Learning

- Independent research
- Complete research process with planning, action and reflection as well as documentation
- Acquisition of cross-curricular research skills includes:
  - Developing of questions
  - Methodically supported acquisition of insights
  - Critical reflection on fundamental questions (Gess, Deike & Wessels, 2017)



Modified from Huber, 2009

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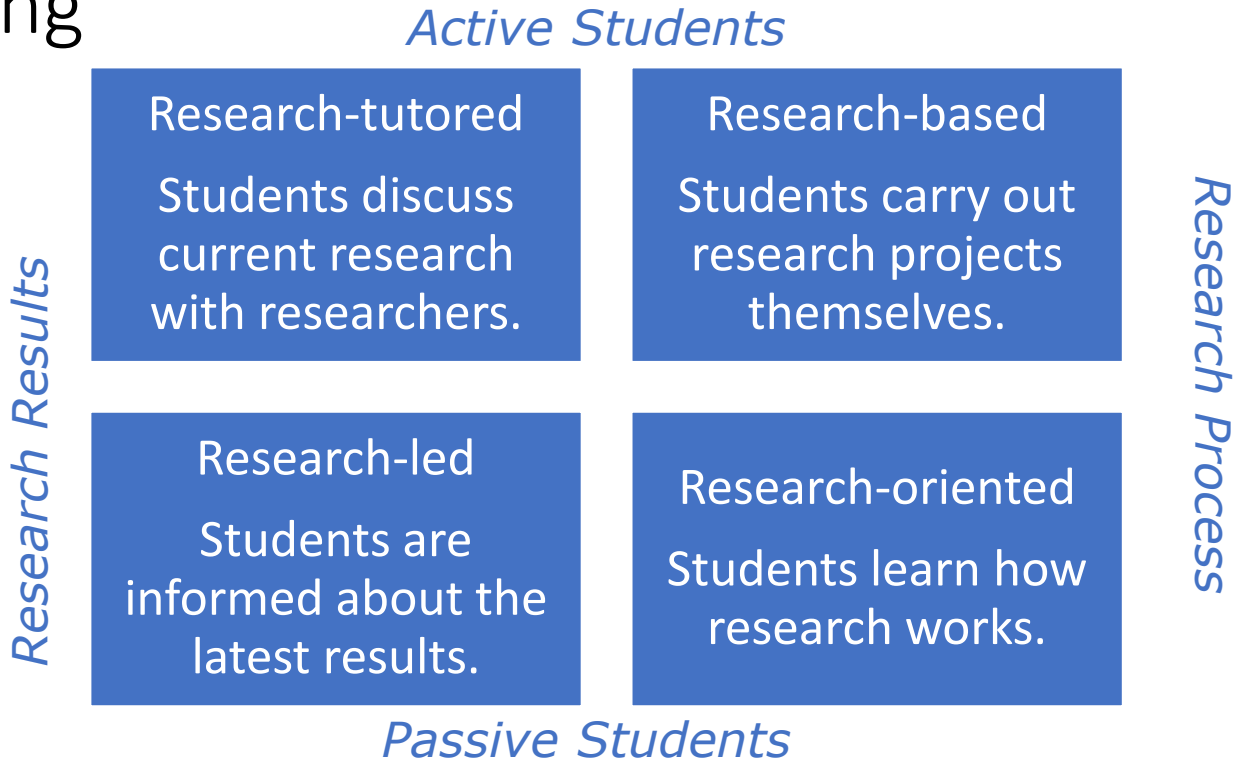
Levels of Development of Research-Based Learning



Research-teaching nexus modified from Healey and Jenkins (2009), cited in Mieg, 2017, p. 21

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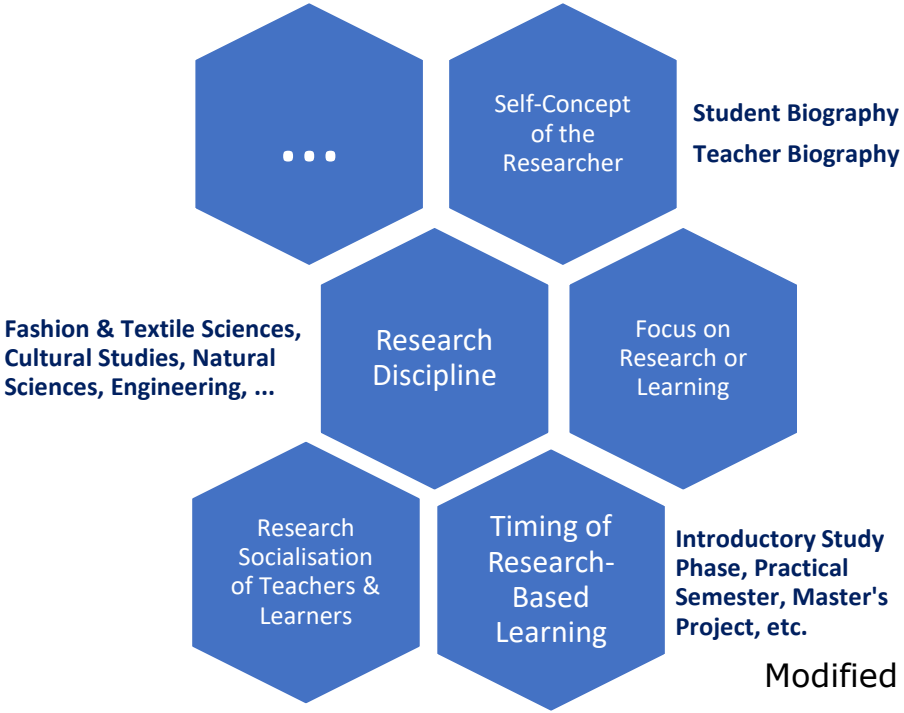
Influencing Factors on the Implementation of Research-Based Learning



Modified from Mertens et al., 2020

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Research-Based Learning and its Objectives

- According to the *Study by the Hamburg Centre for University Teaching and Learning* on research-based learning in the introductory phase of studies, different objectives are associated with research-based learning (Lübcke & Heudorfer, 2019):
- The objectives of the responsibles for the study programmes in different subjects and at different universities show an extremely wide range.
- Different objectives can be achieved with research-based learning, “but an exaggerated significance and functional overloading of this concept is rather detrimental to the cause” (Tremp, 2020, p. 263).

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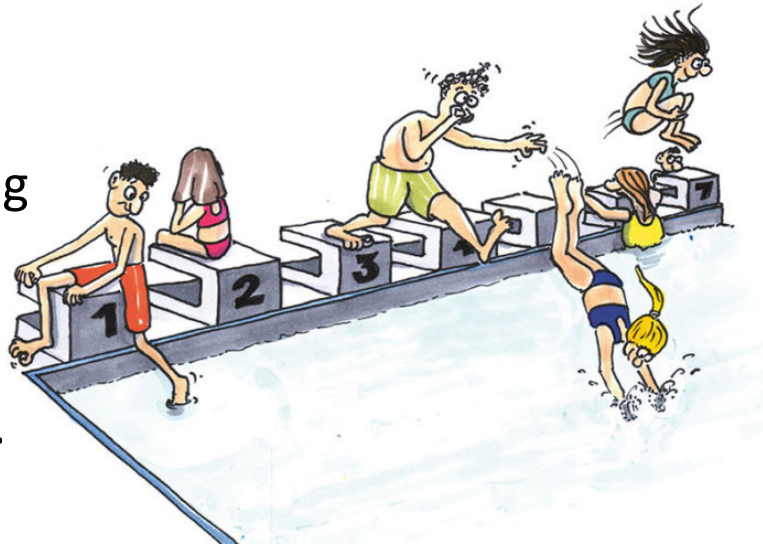
Research-Based Learning and Heterogeneity

- Research-based learning can sensitise teachers to students' individual learning conditions and prerequisites.
- On the other hand, research-based learning can also sensitise students to the heterogeneity among themselves and to forms of structural and institutional discrimination (Kaufmann & Koch, 2015, p. 220).



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Critical Findings on Student Heterogeneity

- Students' life circumstances and educational biographies are more diverse than in the past.
- The spectrum of differences between students poses a challenge.
- The perceived great heterogeneity 'stresses' a higher education system or the individual institutions, which assume reasonably comparable prerequisites for access to studies (Prenzel, 2015, p. 11 cited in Satilmis, 2019, p. 37).

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Critical Findings on Student Heterogeneity

- Forms of indirect instruction place high demands on the competence of teachers (Wild & Esdar, 2014, p. 50).
- With regard to the students, it is argued that individualised action-oriented teaching-learning settings are only purposeful when the learners have the necessary subject-specific, scientific-propaedeutic, cooperative, self-regulatory etc. skills (Wild & Esdar ,2014, p. 50).
- According to Wild and Esdar (2014), an open format of research-based learning is not suitable for a heterogeneous student body.

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Research-Based Learning and Heterogeneity

- The Research-Based Learning approach offers the opportunity to address the heterogeneity of students and to professionalise them with regard to their later professional activities.
- Different interests of the students can be taken into account by giving them freedom of action and design in the processing of tasks and the presentation of the results of their work.
- In addition, they can participate in the structuring and content design of the teaching-learning processes. In this way, their self-efficacy beliefs are taken into account.

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Making Research-Based Learning Diversity-Oriented

- Understanding heterogeneity as a resource and not an obstacle for
  - a variety of perspectives and
  - self-knowledge about one's own positioning
- Getting to know the significance of one's own biography as a researcher, guided by methods
- Getting to know and applying scientific methods and perspectives
- Experiencing one's own positioning as a researcher by going through research processes, because …
- *Diversity not only provides a fruitful initial condition for research-based learning, but represents an important foundation for research-based learning.* (Satilmis, 2019, p. 49)

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Special Features of Research-Based Learning

- Research-based, research-oriented, inquiry learning (Huber, 2014) is more than just a "didactic trick".
- Learners should either develop a question or problem themselves or allow themselves to be persuaded to do so by the teacher.
- Research-based learning should be directed towards gaining new insights and not only be subjectively meaningful for the learners. (Huber, 2009, p. 32)

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Scaffolding in Research-Based Learning

- Cognitive, emotional and social experiences are gained during the research process.
- Starting from the initial interest for the object of research, the research process leads through ups and downs, allows uncertainties and experiences of success to be experienced (Huber, 2009, p. 12).
- The learners' independence plays a major role. Accordingly, teachers primarily have an assisting and advising function. If necessary, they give suggestions but also instructions and assistance.
- Through various forms of support (scaffolding), a variation in student autonomy is possible.

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Development of Scaffolding

- Scaffolding is the temporary support of learners in teaching-learning processes. As the learners' competences increase, scaffolding is further reduced.
- The concept goes back to the sociocultural theory of the Russian psychologist Lev Vygotskij (1978). Wood, Brunner and Ross (1976) used the metaphor of scaffolding to describe instructional practices in early education and mother-child interaction (maternal scaffolding).
- Today, the linguistic and technical support of learners in solving tasks that they are not yet able to do on their own is referred to as scaffolding.

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Scaffolding in the Language-Subject Context

- Scaffolding is particularly important in the integration of language and subject learning for a targeted, systematic way of promoting the acquisition of subject literacy (Gibbons, 2015; Kniffka, 2019).
- Learners are supported in acquiring new conceptual subject knowledge, developing skills, strategies and subject-specific ways of working. This is achieved when language and subject content are taught in an integrated way.
- The aim is to acquire knowledge increasingly independently and to verbalise newly acquired content adequately (Meyer & Coyle, 2017).

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Design-Based Research

Design-based research, also called design research, belongs to development research.

The research approach addresses the following questions:

- How can development approaches be designed and what do they achieve?
- What theoretical backgrounds are relevant, such as design principles, learning paths and learning objects?
- The aim is to include empirical research into learning levels and learning processes and to design learning environments based on theoretical and empirical findings.

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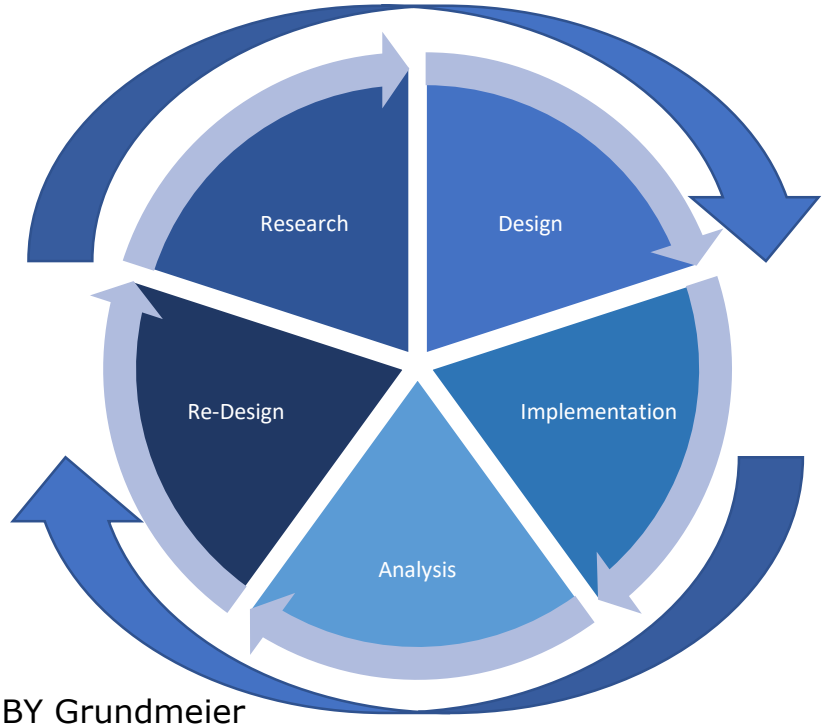
Processes of Design-Based Research

Development and research in continuous cycles:

- Research
- Design
- Implementation
- Analysis
- Re-Design



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Design-Based Research (DBR) Approach

- Design-based research, like Design Thinking, is characterised by an iterative cycle of design, execution, analysis, implementation and redesign (DBRC, 2003).
- Results from pilot studies flow into the next cycle of enquiry (Cobb et al., 2003, p. 10).
- DBR arose from the need for a research approach that investigates learning phenomena in real-life situations rather than in laboratories.
- DBR goes beyond narrow measurement criteria and focuses on the design of learning processes. The approach thus fills a gap in teaching-learning research that has received little attention to date (Reinmann, 2005).
- DBR supports collaboration between participants and researchers throughout the process (Cobb et al., 2003) and offers the opportunity to share expertise across disciplinary boundaries (DBRC, 2003).

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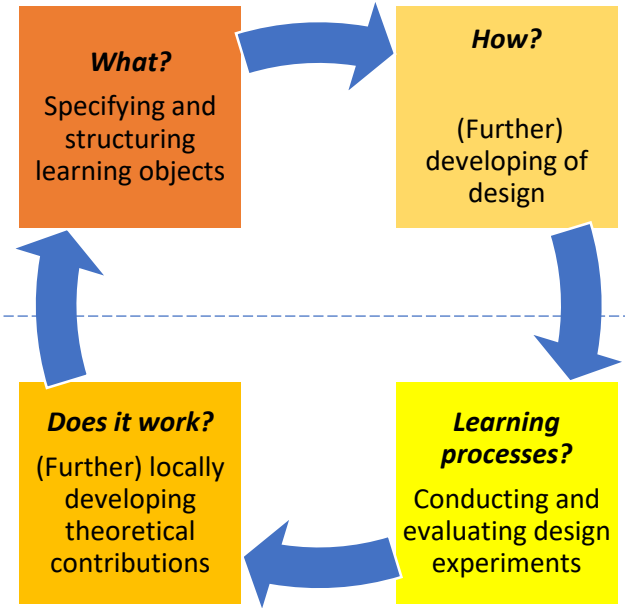
From Development Process to Product and from Research Process to Product

Development Process



Development Product

Specified and structured learning objects

Design principles

Teaching-learning arrangements

Contributions to local theories of subject specific teaching and learning processes on modes of action and conditions of individual design elements

Modified from Prediger et al., 2012

Research Process

Research Product

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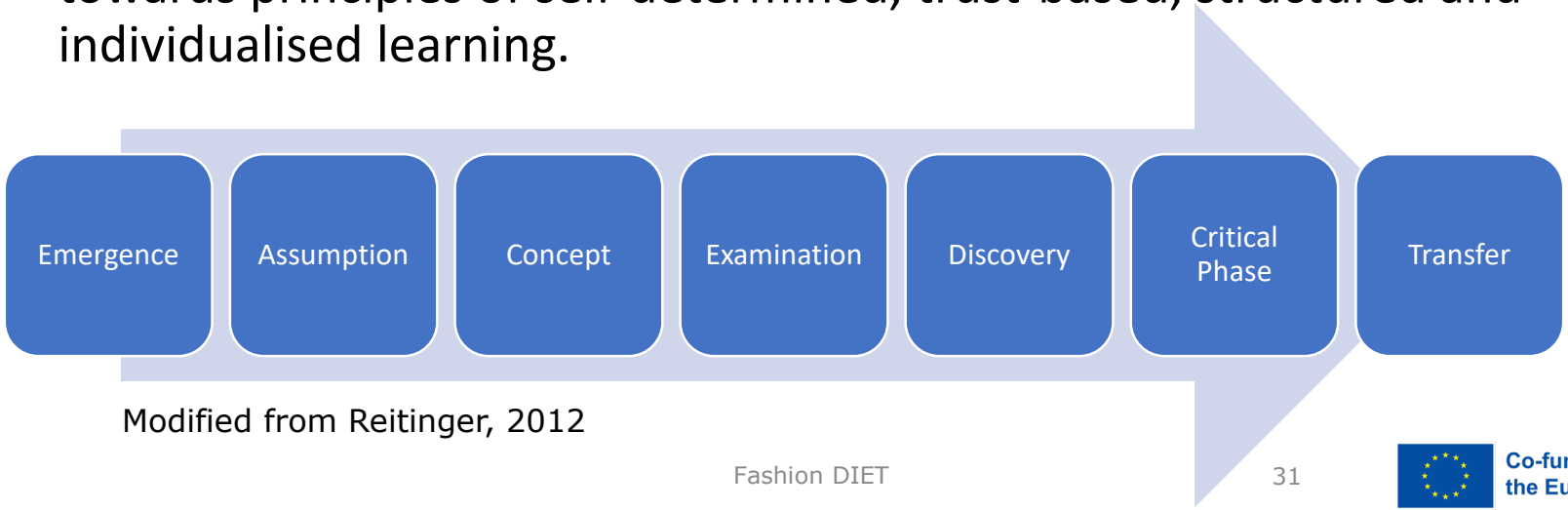
Research-Based Learning based on the AuRELIA Concept

- AuRELIA: *Authentic Reflective Exploratory Learning and Interaction Arrangement*
- The concept is understood as a constructivist model and is oriented towards principles of self-determined, trust-based, structured and individualised learning.



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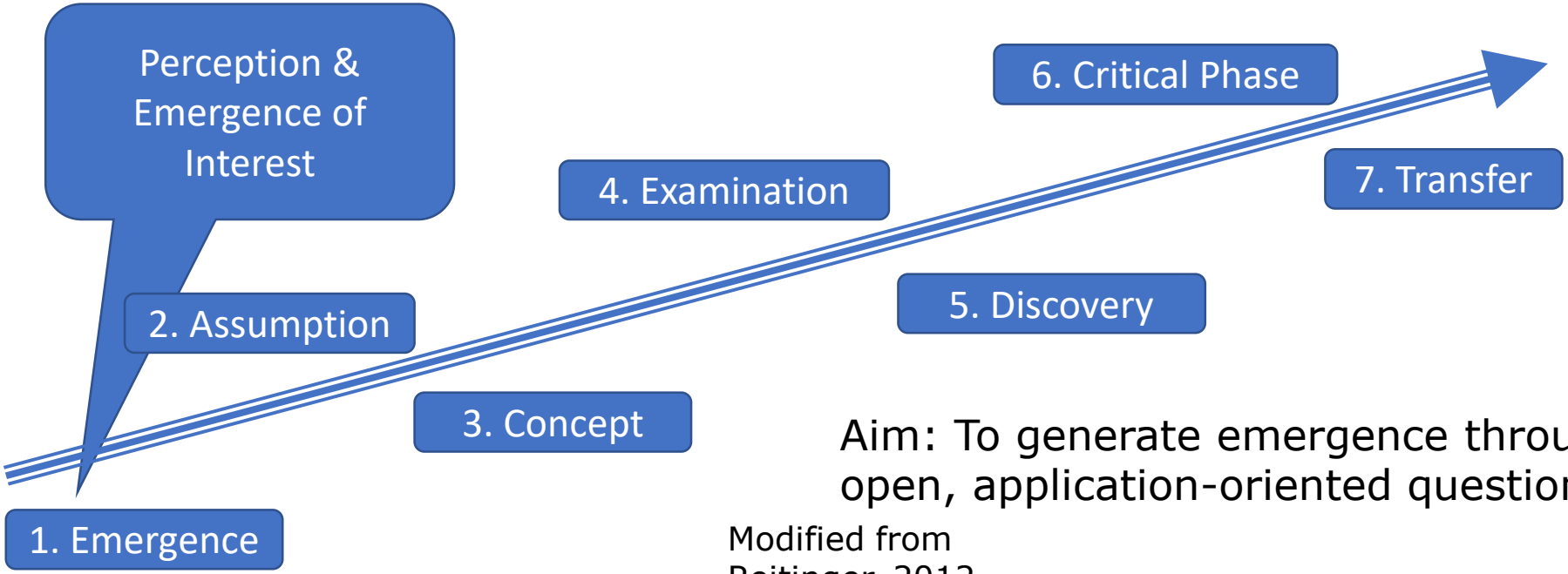
AuRELIA – Emergence Phase



Aim: To generate emergence through open, application-oriented questions.

Modified from
Reitinger, 2012

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Emergence – a Definition

- A term of recent English philosophy according to which higher levels of being emerge from lower ones through newly arising qualities.
- Emergence (Latin "emergere" for to emerge, to rise, to come to light) refers to the formation of new properties or structures of a system, such as water, as a result of the interaction of its elements.
- Together, they produce more different properties than individual molecules.

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Initiation of Research Questions and Documentation

- How can students initiate research questions in the context of fashion, clothing and textiles?
- Media support for questions and problems, e.g.
  - press reports, photos
  - films, video documentaries
- Social Media
- The open learning process can be facilitated by a given structure, such as a “research plan” to document the research.

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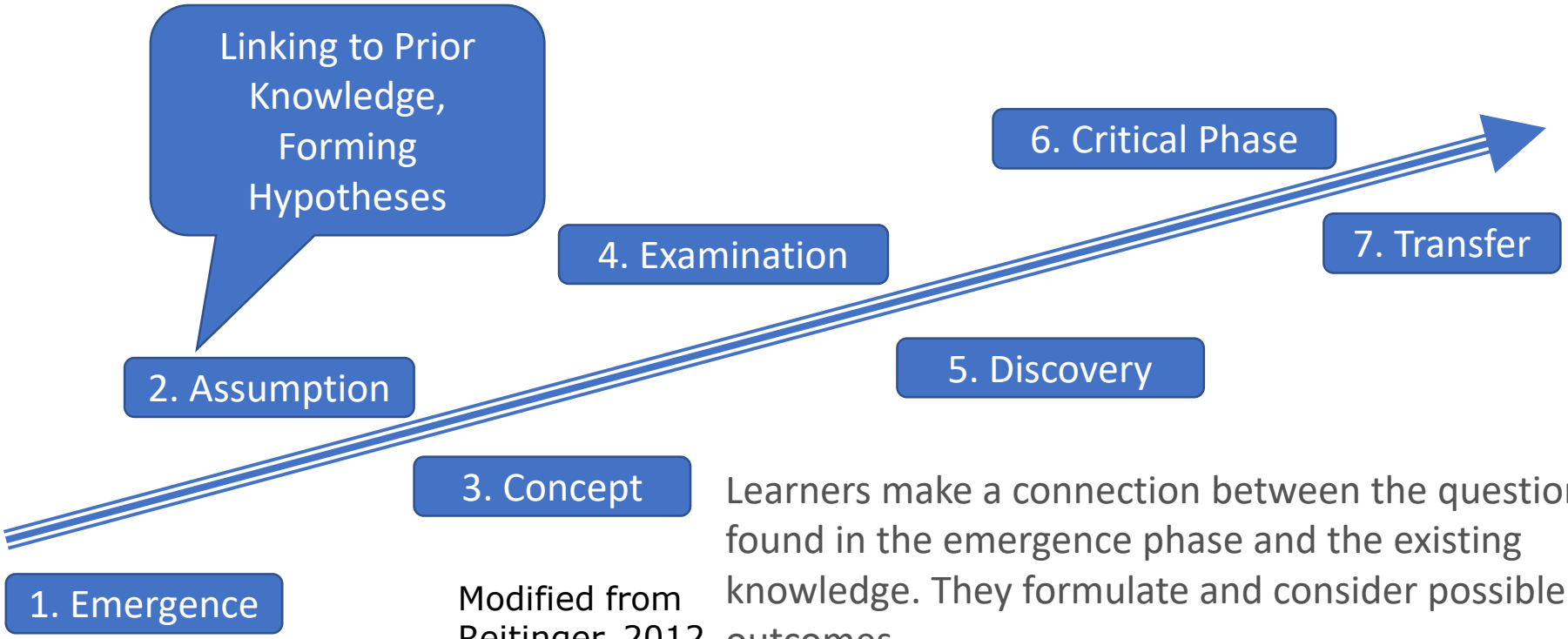
AuRELIA - Forming Hypotheses



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Learners make a connection between the question found in the emergence phase and the existing knowledge. They formulate and consider possible outcomes.

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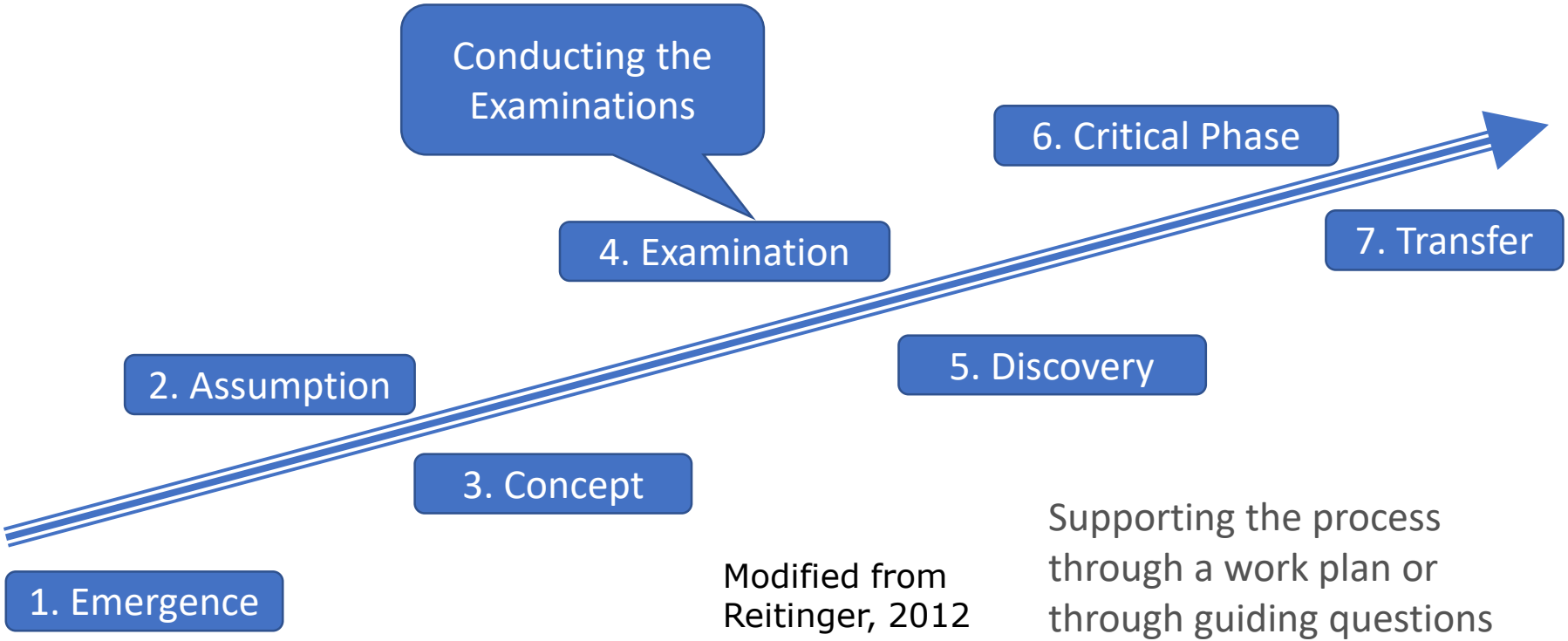
AuRELIA – Planning Phase



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Supporting the process through a work plan or through guiding questions

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Example of the Structure of a Research Plan

Research-based learning in context: *fashion, clothing and textiles*

Demonstration through a picture (photo, illustration, drawing).

Details:

- Team members
- Research interest
- Hypothesis
- Concept for the research process
- Documentation of the process
- Results
- Supporting material

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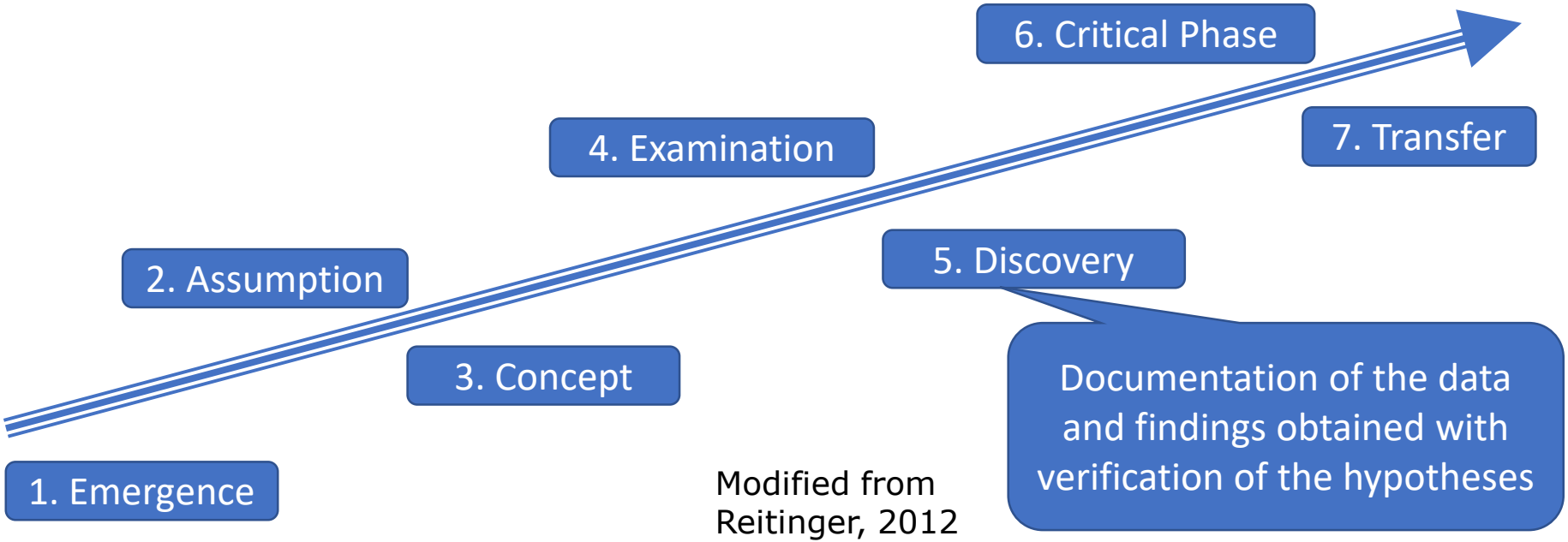
AuRELIA – Discovery Phase



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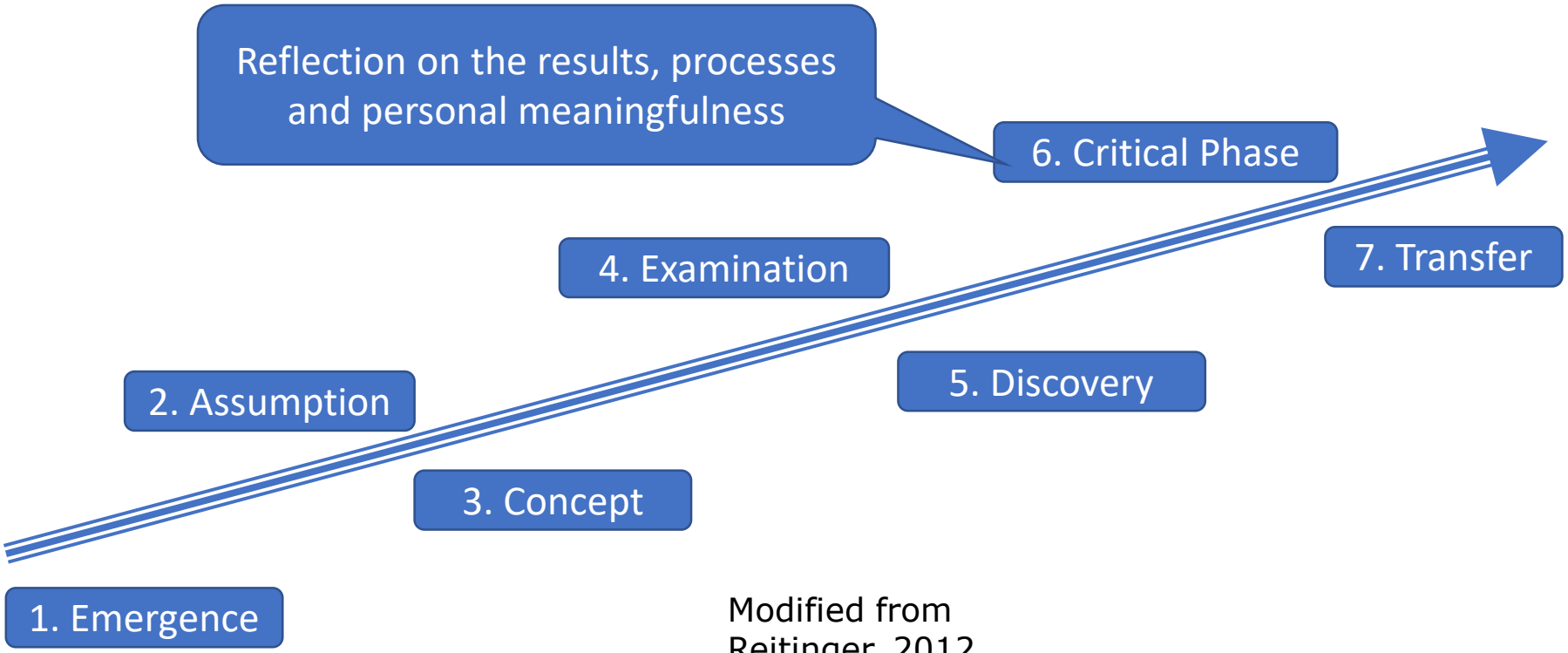
AuRELIA – Reflection Phase



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Questions for Students to Reflect on

Reflecting on the research process:

- How did the process of finding and answering the research question go?
- Which steps were particularly easy or difficult? At what point did a different approach than planned become necessary and why?
- How did the team members work together?

Reflecting on the results:

- How satisfied is the team with the results? Are they surprising? If so, why?
- What do the research question and its results mean for each person individually?

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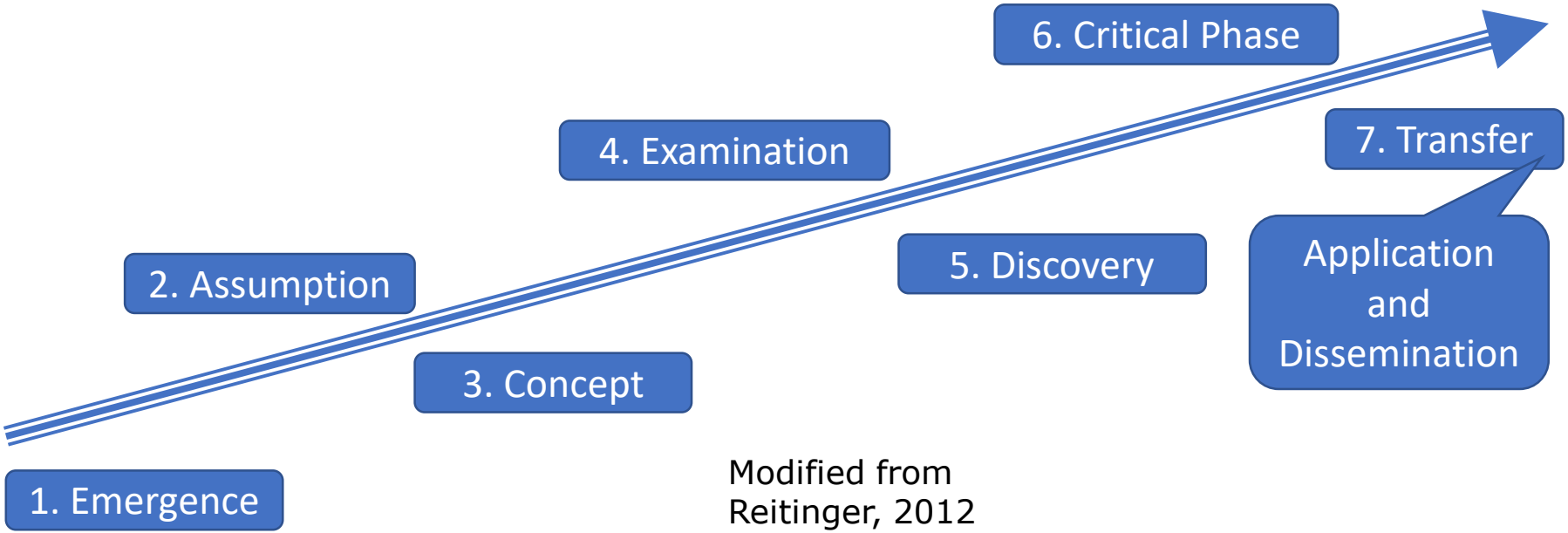
AuRELIA – Transfer to other Areas



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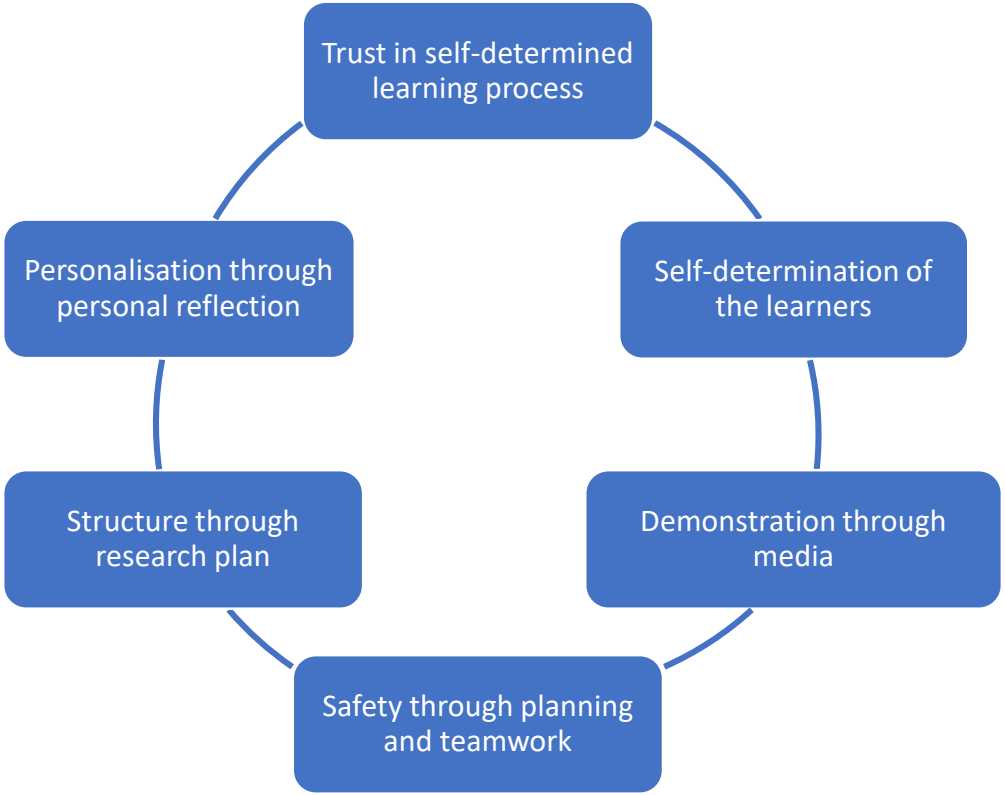
Six Principles of the AuRELIA Concept



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Reflection on the Objectives of the AuRELIA Concept

- According to the AuRELIA concept, an open learning process and the specification of structure do not represent a contradiction.
- The specification of structure should prove to be effective.
- Therefore, the learners receive a research plan to document their investigations.
- Pictures as photos, illustrations and drawings as well as comics serve to illustrate the idea, question or problem, but they can also illustrate the research process.
- Through taking photos, illustrating and drawing, a creative process is set in motion that leads to personal reflection.

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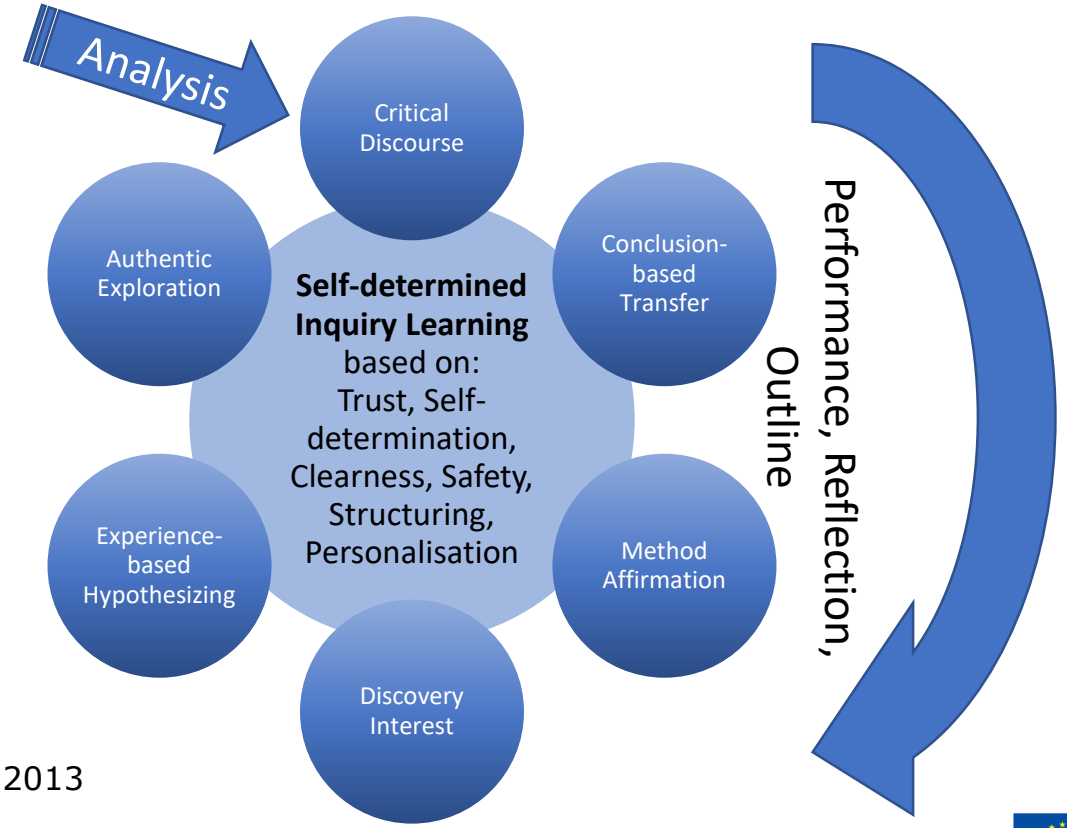
Theorie of Inquiry Learning Arrangements (TILA)



Modified from Reitinger, 2013

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Criteria of Inquiry Learning Inventory (CILI)

- The CILI rating scale is used to measure the extent to which the criteria of research-based learning are met.
- The criteria are: interest in discovery, method affirmation, experience-based hypothesising, authentic exploration, critical discourse, and conclusion-based transfer (Reitinger, 2016).

6 selected criteria according to Reitinger (2016)

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Conclusion

- Based on relevant problems, research-based learning represents a valuable didactic-methodological approach to developing motivation, subject identity and interdisciplinary competences.
- To sum up, the mere application of research-based learning does not ensure that these effects will occur as much as any other form of teaching because that depends on the design (Huber, 2009, p. 16).

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References and Further Reading

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