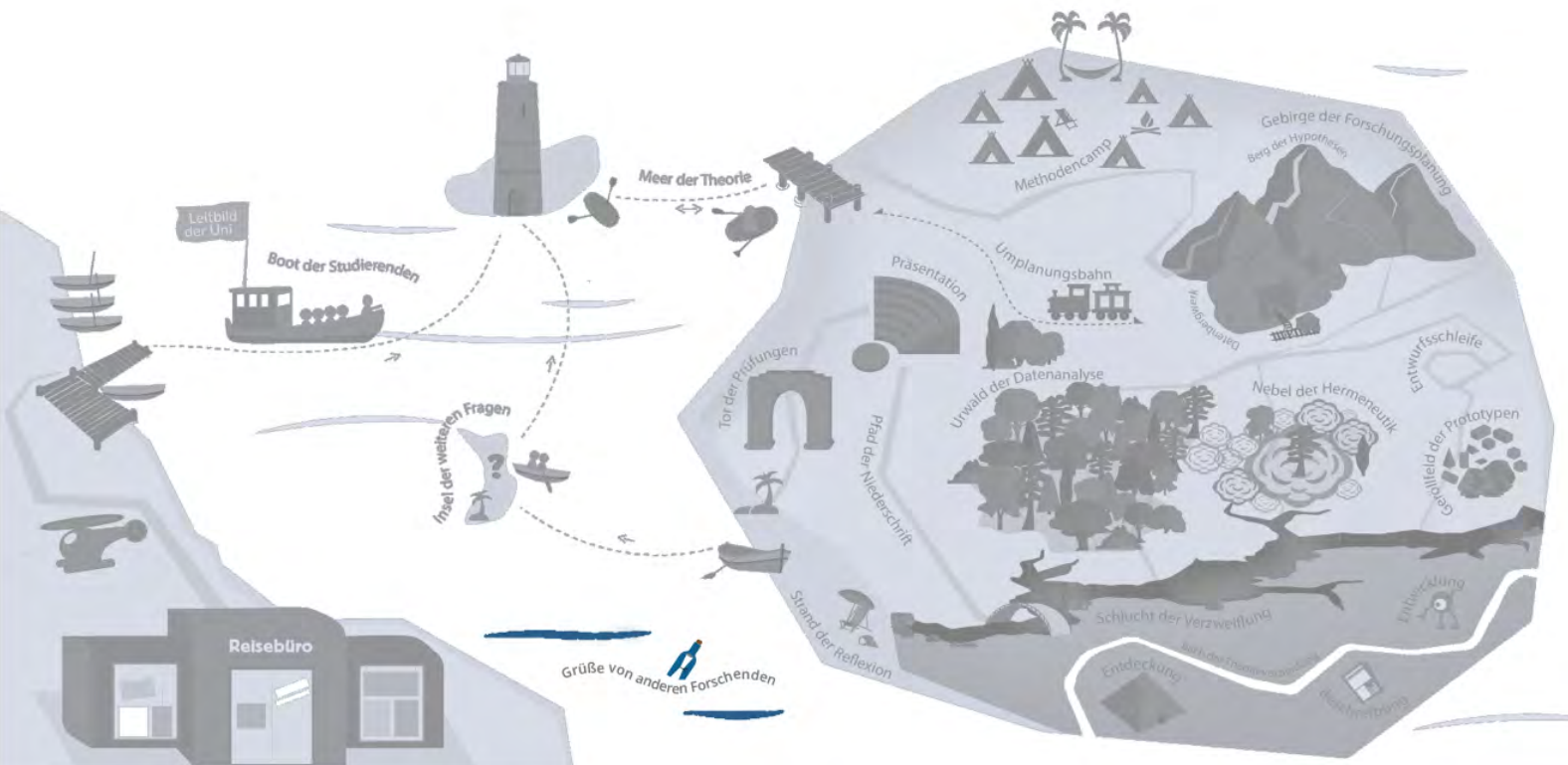




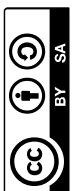
Examples & Good Practices

Educational science research in blended learning format



KEYWORDS:

EDUCATIONAL SCIENCE,
BLENDED LEARNING FORMAT, AI,
CASE STUDIES



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Metadata

Name: Prof. Dr. Claudia de Witt, Silke Wrede, M.A.,
Farina Veller M.A.

University: FernUniversität in Hagen

Subject: Educational science

Abstract: This practical example takes place at the FernUniversität in Hagen and describes how research-based learning in the field of educational science is implemented in a blended learning format.

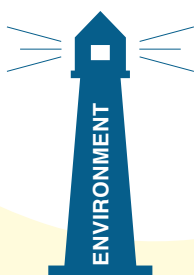
Special feature: Blended learning format, AI, case studies

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Universität Hamburg

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- Open University in Hagen
- Educational sciences
- Bachelor students
- Implementation: more than 3 times
- 15 CP & 8 SWS
- Number of students: approx. 240 students enrolled in the module of the degree programme; approx. 65 students who take the examination in the module

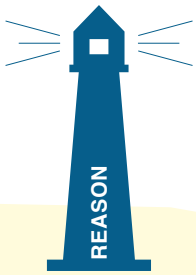
ENVIRONMENT:

The provision for research-based learning is implemented in a media education module in the Bachelor's degree programme in Educational Science at the FernUniversität in Hagen, where the distance learning course is carried out using a blended learning concept. Support is provided via the Moodle learning management system and is supplemented by synchronous events in the form of lectures, seminars, workshops, and consultation hours - digital and/or face-to-face. With these different formats, the FernUniversität aims to meet the needs of the heterogeneous student body, which is predominantly spread around Germany, Austria, and Switzerland, but also around the world. 80% of students at the FernUniversität work full time and therefore study only in the evenings or at weekends. This requires a high degree of personal effort from students in terms of planning and learning. Self-regulated learning skills are therefore essential.

The module takes place in the final phase of the degree programme and, in addition to defined specialist skills, focuses in particular on the preparation and production of an academic paper. Students therefore plan their own research work, which they develop in contact with a supervisor and finally carry out. A typical research cycle with the Kolb learning cycle (Wildt, 2009) is integrated into the course of the semester for this process. The students' task is to develop an individual case study in the subject-specific context of the module and to analyse and discuss it in their term paper, while at the same time drawing on the conceptual and theoretical foundations of the respective subject area.

Another special feature of this module is that it is integrated into the research of the AI.EDU Research Lab 2.0 of the CATALPA research centre. The lab researches and develops AI applications for the individual research phases of the module. Various technical support systems have been and are currently being developed, such as a personalised prior knowledge test, an AI quiz for independent knowledge assessment, or recommendation systems to assist in finding topics.





- Personal professional concern



REASON:

The main reason for the introduction of research-based learning was that students should learn to go through a complete research cycle independently and develop an interest in their own research in preparation for the Bachelor's thesis. In addition, the task of presenting a self-developed case study in the term paper and analysing and discussing it in the paper, drawing on key concepts and central theoretical principles, and finally reflecting on the central findings, provided a good opportunity to encourage students to work independently. In addition, research-based learning is particularly suitable with regard to the new possibilities offered by generative AI: For example, the complex learning architecture of research-based learning leads, on the one hand, to students not utilising the potential of generative AI and, on the other hand, to them being able to try out the new technical possibilities in different phases of the research cycle. Although this is an afterthought, it reinforces our belief that research-based learning is a suitable educational approach for this module.



- 1 semester long
- Embedded in a course
- Anchored in the curriculum & mandatory
- Research process: supported as needed
- Feedback: Peers, instructors
- Research results: internal

IMPLEMENTATION:

In this module, the examination consists of a case-study-based term paper. The task is to develop and refine the idea for an individual research project over the course of the semester, conduct the research and finally write it up. To this end, students go through research activities and challenges (research, finding and selecting a topic, generating a central question, etc.). Unlike in many other research-based learning programmes, students do not work in groups, but carry out their research project individually. However, they do receive feedback and insights from the research projects of their fellow students through various presentation and discussion opportunities. On closer inspection, these are key research skills that need to be practised and tested several times in order to be handled safely. At this point, it therefore makes sense to link research and learning in an action-orientated way. Individual activities are accompanied and supported throughout the semester. The aim is to incorporate the students' existing experience and thematic interests and to deepen individual research steps.



Illustration 1. Learning and research in the B.A. Educational Science module

In the first phase, students work on the learning units independently. Reflection and exchange with each other and with the supervisors take place via the discussion forums in Moodle and in synchronous sessions.

Table 1. 1st phase - Development of the learning units (5 weeks)

Topics	Supervision via Moodle	Online session
<ul style="list-style-type: none"> Relationship between media and education Basics of the concepts of media education and media communication Influences of digital media on education based on current phenomena (e.g. big data), possible future scenarios (e.g. smart learning) and media-ethical consequences (e.g. digital sovereignty). Datafication of teaching and learning Central areas of media education: understanding of media education and media competence, knowledge of media usage behaviour, an examination of media effects and socialisation 	<ul style="list-style-type: none"> Cooperative editing of the learning units using the PDF annotation function Discussion with materials on Moodle: Quizzes, timeline on the development of media education 	<ul style="list-style-type: none"> Introduction to the module

The second phase initially deals with the individual preparation of the term paper, then in the form of 1:1 supervision via Moodle.

Table 2. 2nd phase - Preparation of the term paper (10 weeks)

Identification of the research interest	Supervision via Moodle	Online sessions
<p>Start planning the term paper with three guiding tasks:</p> <ol style="list-style-type: none"> 1. Creation of a case study 2. Linking the case study with the content of the learning units 3. Formulation of an initial idea for a topic and a guiding question 	<ul style="list-style-type: none"> • Participation in the research of the AI.EDU Research Lab 2.0 • 1:1 support for the development of the individual topic • Research and discussion of the literature subject on Moodle 	<ul style="list-style-type: none"> • Online consultation on the AI.EDU Research Lab 2.0 project • Seminar on academic practices • Scientific writing with AI

The questions to be addressed in the term paper can be very different and reflect the various research interests. For example, one student dealt with the question of what opportunities and limitations the Large Language Model GPT-3.5 offers students in research-based learning for writing a scientific term paper in a university context, while another student investigated the extent to which the targeted use of tablets in primary schools influences the development of pupils' media skills.

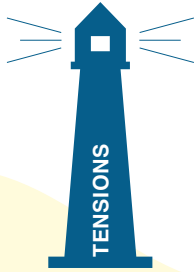
Writing the term paper is scheduled for the third phase of the semester.

Table 3: 3rd phase - Writing the term paper

Implementation of the planning of the term paper	Online sessions	Completion of the module
<ul style="list-style-type: none"> • Writing the term paper (6 weeks from registration) 	<ul style="list-style-type: none"> • Open online consultation hour for homework • <i>Online lecture AI and didactics with Prof Dr de Witt</i> • <i>Online information event on final theses in the teaching area</i> 	<ul style="list-style-type: none"> • Feedback on examination performance with annotated term paper and detailed criteria-based comment sheet

Note: Courses in italics are cross-module courses

Due to the new technical possibilities of generative AI, the module has been adapted so that students can use generative AI in the various phases and, for example, create text fragments for a case study. The students then revise the content created with generative AI and transparently document the tools used in a list of resources in the appendix of the term paper.



Tensions between demands for...

- Self-organisation and external organisation
- Student skills development and requirements of the research process
- Individual phases and the entire research process
- Workload and resources available to teachers
- Workload and the formally calculated time required for students
- Course planning and adaptation as a result of the dynamics of research-based learning

TENSIONS AND CONTRADICTIONS:

Students are usually able to quickly identify a thematic interest based on the course units, their own previous experience from the degree programme and their interests. The development of their own interest into a research plan with a topic and the generation of a central question is a challenge. However, the formulation of an objective, central question stands in contrast to a selection of topics that is often guided by interests and thus emotionally charged. This task, which seems easy at first glance, soon turns out to be a source of great uncertainty: „Does the topic fit the module?“ What is the educational science/media education reference? What actually is a literature-based term paper?“ In order to solve these problems, students need time for reflection and patience, which is often at odds with the time restraints experienced by the frequently working students at the FernUniversität, who often complete their studies in their limited free time. The process of research-based learning with the development of an own research project and the planning of the case-study-based term paper including a reflection requires time resources that are not available to all students.

From the teachers' point of view, the individual and thematically very varied 1:1 support is intensive and time-consuming. Interaction with students takes place via Moodle, in writing and asynchronously. In some cases, students find it difficult to write down their research ideas in the forum and present them in a comprehensible manner. Feedback from supervisors is also not always read carefully and quick responses are posted, meaning that not all comments from supervisors are taken into account. Asynchronous supervision is sometimes an additional challenge, as the time it takes to receive feedback can vary.





Objectives and values:

- Pursuing a research interest
- Acquiring writing skills
- Acquiring methodological skills
- Recognising connections between subjects of study
- Discussing specialised literature

EFFECTS:

The module enables students to go through a complete research cycle, combining theoretical knowledge, methodological skills and practical research. This intensive experience results in students entering the final phase of their degree programme with more confidence and fewer problems when writing their Bachelor's thesis. Students are also able to tackle basic research challenges, express needs and formulate questions - an effect that is probably due to the open communication via Moodle.

In addition, the integration of generative AI into research has the effect that students can better assess the possibilities of this technology and learn where the technology reaches its limits. This can be a first step towards AI literacy and support students in learning how to use generative AI responsibly and reflectively during their studies.

Further literature on the Kolb learning cycle and on the topic of AI and research-based learning is linked here.

