Geogames in Geography Education – A Design-based Research Study
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Agenda

• Introduction

• Research framework
  o Design-based research
  o Geogame Neocartographer
  o Research questions and first results

• Conclusion and outlook
Introduction
Introduction

Location-based mobile learning (LBML)

• mobile electronic devices (MED) as tools for geography education
• often used in game-based learning and gamification context
• potential for sustained learning experiences
• growing number of "best practice" applications
Introduction

LBML obstacles

• lack of technical equipment
• teachers’ concerns
• re-location of game content
• lack of thoroughly designed and tested games for geography education

Need for action

→ development of didactical teaching concepts
Research framework
Design-based research (DBR)

“DBR is a methodology designed by and for educators that seeks to increase the impact, transfer, and translation of education research into improved practice.”

(Anderson et al. 2012, p. 16)
Research framework

- Literature review; theory-driven design
- Problem identification
- Development: design-principles, educational interventions
- Implementation of product
- Design-cycle
- Reflection
- Interpretation: theoretical and empirical research findings
- Formative evaluation
- Reference to design-principles
- Analysis of data
- Re-design
Research framework

Design principles

• derived from theory → applied for specific context
• adapted, discarded or confirmed during research process
• function as guidelines

“If you want to design intervention X for the purpose/function Y in context Z, then you are best advised to give that intervention the characteristics A, B, and C, and to do that via procedures K, L, and M, because of arguments P, Q, and R.”

(Van den Akker, 1999)
Geogame Neocartographer - teaching sequence

- introduction of the game and organizational measures
- implementation outdoors
- debriefing and reflection teaching sequence
Research framework

Geogame Neocartographer - teaching sequence
Research framework

Research questions

*How can LBML with Geogames contribute to the development of a more differentiated perception of space and to the ability to reflect upon spatial perceptions?*

Perception
Which tasks encourage students to involve themselves (most intensively) with their surrounding environment?

Intrinsic motivation
Which factors provide a promising setting for students to gain a high degree of intrinsic motivation?
Research framework

Design-cycle - accompanying research

Practical problem / research question

2013
- Interviews
- Questionnaire IMI
- Protocols participative observations
- Reflection in team

2014
- Interviews
- Questionnaire IMI
- Protocols participative observations
- Reflection in team

2015
- Problem-focused interviews
- Questionnaire IMI + PENS
- Protocols participative observations
- Reflection in team

2016
- Problem-focused interviews
- Questionnaire IMI + PENS
- Protocols participative observations
- Reflection in team

Interpretation theoretical and empirical research findings
Research framework

- Literature review, theory-driven design
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- Reference to design-principles
Tasks that lead to a change in perspective can raise the awareness that the perception of space is a subjective and selective process.

(with reference to Röll 2014 et al.)
Research framework

1. Literature review; theory-driven design
2. Problem identification
3. Development: design-principles, educational interventions
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7. Reflection
8. Interpretation: theoretical and empirical research findings
9. Re-design
10. Reference to design-principles
11. Analysis of data

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Research framework

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Geogames in geography education

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Research framework

Literature review; theory-driven design

Development
- design-principles, educational interventions

Implementation of product

Design-cycle

Problem identification

Re-design

Reflection

Interpretation
- theoretical and empirical research findings

Reference to design-principles

Formative evaluation

Analysis of data
“In our picture you can see a retired person who is watching a street musician, a schoolboy who is playing on his mobile phone, a university student who is standing around waiting for his next lesson or maybe quickly buying some food, families who are having lunch at McDonald’s. All sorts of things. Or just young people who go shopping and then come back with full shopping bags.”

“… we tried to describe it in a way so that the blind person is really able to experience the beauty of this place. For example the smell of the plants, the trees that grow there, the wind that hisses through the trees.”
Research framework

Design principles

Geogames can raise the awareness that the perception of space is a subjective and selective process if …

• ... the attention is drawn to specific aspects (through tasks)
• … tasks lead to a change in perspective
• … these aspects become clear through a phase of reflection
Research framework

Research questions

• intrinsic motivation
  (autonomy, competence, relatedness, et al.)

• perception of space
  (different methods / tasks e.g. “search for traces“, inappropriate behaviour, et al.)
Conclusion and outlook
Conclusion and outlook

Conclusion

• attention can be drawn to certain aspects
• students gain a more differentiated perception of space (not all tasks equally suitable)
• to transfer that experience to a meta level the phase of the post processing is essential

• motivated students
  o voluntarily engage with their surrounding environment
  o don´t seem to mind the interruption of the game flow to perform tasks
Conclusion and outlook

Outlook

• analyze the data, re-design the intervention and then test it again in practice
• formulate design principles as a guideline for teachers

• Perception of space and increasing the intrinsic motivation of the learners are the primary objectives in my research

• learn more about the effects of learning with Geogames
• put focus on other research objectives (e.g. orientation in real space)
Thank you...

... for your attention!

... for any questions, suggestions and comments!
References


