Background & Research

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Who am I?

Niklas Humble
Assistant Professor CS
Research Program Coordinator DTML
Pedagogical Development Consultant HPC

- PhD in Computer & System Sciences
- System Developer
- Teacher in Swedish & Philosophy

1. Furudal (Dalarna)
2. Edsbyn (Hälsingland)
3. Linköping (Östergötland)
4. Norrköping (Östergötland)
5. Forsbacka/Gävle (Gästrikland)
6. Östersund (Jämtland)
7. Gävle (Gästrikland)
Teaching

- Programming
- Interaction Design
- Methodology and Writing
- Thesis Work
STEM & CS Education
STEM & CS Education

PhD Thesis

Programming Secondary School
Teacher Perspective

Affordances

Data collection
- Interviews
- Focus Groups
- Documents
- Observations
- Workshops

Data analysis
- Content analysis
- Thematic analysis

Table 5. Summary of action possibilities and constraints

<table>
<thead>
<tr>
<th>Action possibilities</th>
<th>Support subject content</th>
<th>Facilitate motivation and engagement</th>
<th>Develop digital competence</th>
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<tr>
<td>Variety</td>
<td>Fun</td>
<td>Holistic views</td>
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<td>Creativity</td>
<td>Playful</td>
<td>Deconstruction</td>
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<td>Powerful</td>
<td>Interesting</td>
<td>Problem-based learning</td>
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<td>Repeat</td>
<td>Curiosity</td>
<td>Confidence</td>
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<td>Re-use</td>
<td>Adaptive</td>
<td>Independence</td>
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<td>Generalise</td>
<td>Hands-on</td>
<td>Error handling</td>
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<td>Interdisciplinary collaborations</td>
<td>Discovery</td>
<td>Technology understanding</td>
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<td>Problem solving</td>
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<td>From consumer to producer</td>
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<td>Less fear of errors</td>
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<td>Visualisation</td>
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Figure 3: Teachers’ conceptual model of programming
Artificial Intelligence in/for Education (AIED)
Artificial Intelligence

**AIED**
- AI in Education
- SWOT Analysis
- Scoping Literature Review (41)

**GenAI**
- ChatGPT in HE
- Consequences for CS
- Analytic Autoethnography

**Data collection & Analysis**
- Field diaries (6)
- Interactions (82)
- Thematic Analysis
Symposium on AI Opportunities and Challenges (SAIOC)  
- Education will never be the same again!

An Online Symposium on 5th December 2023

Co-Hosted by Mid Sweden University and The University of Gävle (Sweden)

In Collaboration with Academic Conferences International (ACI)

https://www.academic-conferences.org/symposia/symposium-on-ai-challenges-and-opportunities-saioc/

SAIOC 2024?
Serious Games
Serious Games & GBL

Escape with Python
- Digital Escape Room
- CT & Python
- K-12 Education

Gaming4Coding
- Mid Sweden University, Universidad Complutense Madrid & Ingenious Knowledge
- Promote coding in K-12 education (especially girls)
- [https://gaming4coding.eduproject.eu/](https://gaming4coding.eduproject.eu/)

SPEDAT (Spel för datalogiskt tänkande)
- CT/Programming
- Higher Education
- Teacher & Students

Computer Programming in Schools – A Visual Novel Game
- My PhD Thesis as a game
- AI tools for dialogue, graphics & music
Related
Related

LA/Process Mining/Stealth Assessment
- Identify development of CT in programming solutions (35+19=54)
- Process Mining (Disco)

Computational Ethics
- Model for intelligent decision support system (IDSS)/AI
- Based on rule-consequentialism

Digital Humanities
- Auto-generation grammar test (Swedish & Swedish as a secondary language)
- Language Teachers
- Web Application
The Project: GenAI, IT Industry & Computing Education
Analyze how GenAI is used and influences people in the IT industry

- Interviews
- Focus Groups
- Observations

Case Study
2 Understand students’ perspectives on, and use of, GenAI in education

- Survey
- Interviews

Mixed Methods
3 Explore teaching methods using GenAI

Planning
Literature Review

Conclusion

Analysis

Action
Workshops

Research
Affordances (Norman)

Constructionism (Papert)

Adult Learning (Knowles)

Flow Theory (Csíkszentmihályi)

CoP (Lave & Wenger)

Cognitive Load Theory (Sweller)

Theory?
THEN WHAT?
GenAI

AI Literacy Framework

Course Development

PD & LLL

LA & Process Mining

Serious Game Development
References


Humble, N., & Mozelius, P. (2022, October). Refurbishing the educational escape room for programming: Lowering the threshold and raising the ceiling. In Proceedings of the 16th European Conference on Games Based Learning (ECGBL2022) (pp. 280-289). ACI. https://doi.org/10.34190/ecgbl.16.1.603


Full list of publications: https://niklashumble.wordpress.com/
THANK YOU!

QUESTIONS?

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