Background & Research

Niklas Humble

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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)

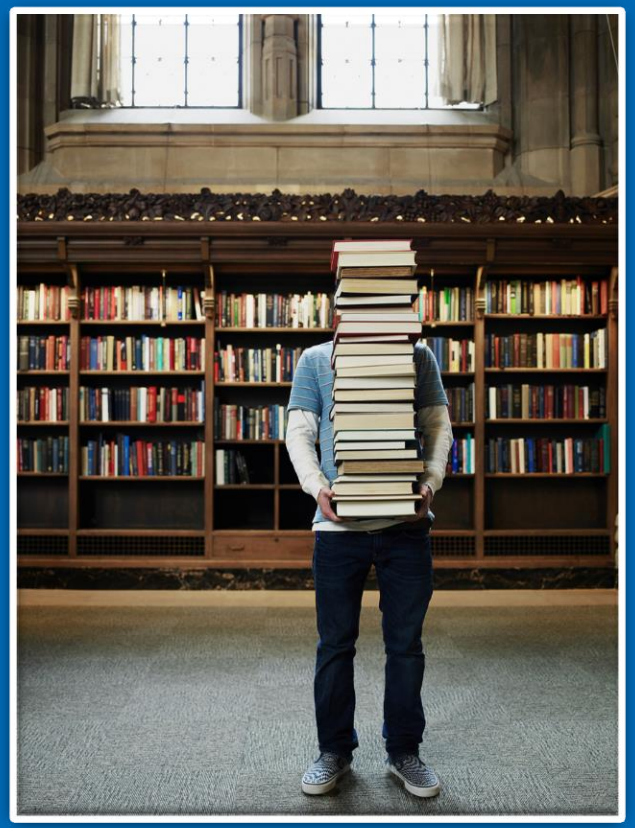
4 Norrköping (Östergötland)

5 Forsbacka/Gävle (Gästrikland)

6 Östersund (Jämtland)

7 Gävle (Gästrikland)

HÖGSKOLAN
I GÄVLE



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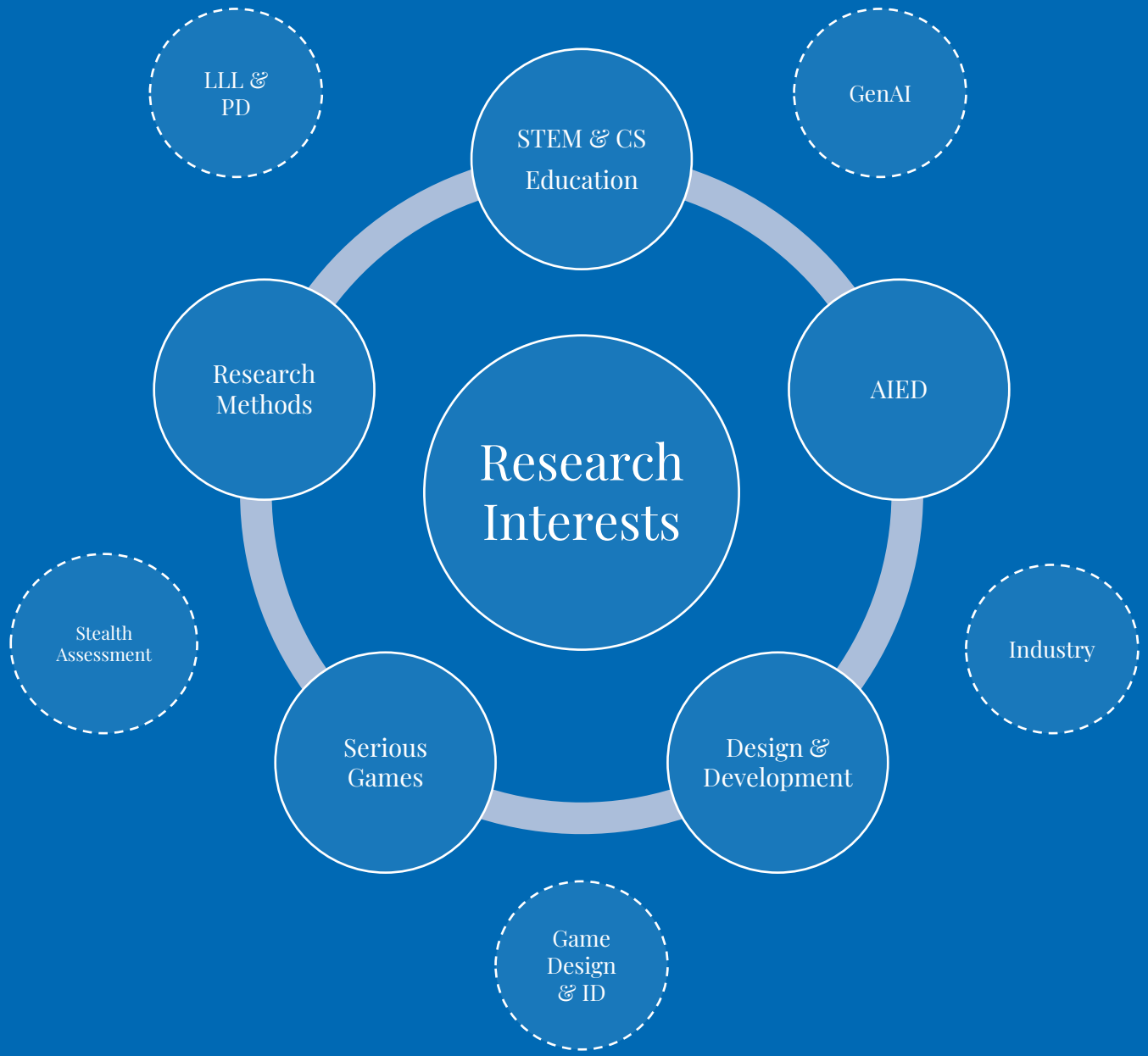
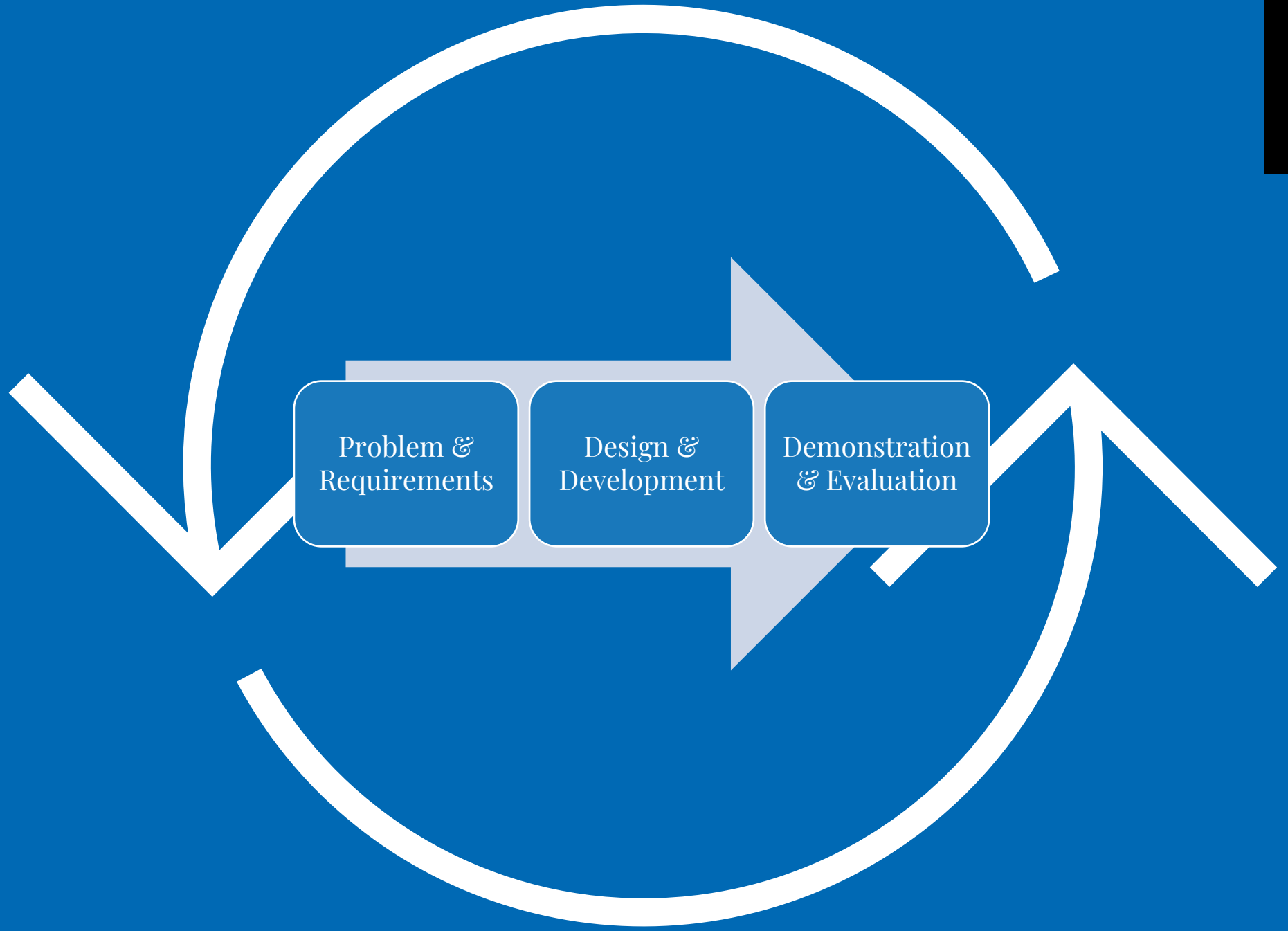
- Teaching
  - Programming
  - Interaction Design
  - Methodology and Writing
  - Thesis Work


LLL & PD
STEM & CS Education
GenAI
Research Methods
Research Interests
AIED
Stealth Assessment
Industry
Serious Games
Design & Development
Game Design & ID


Problem & Requirements
Design & Development
Demonstration & Evaluation

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

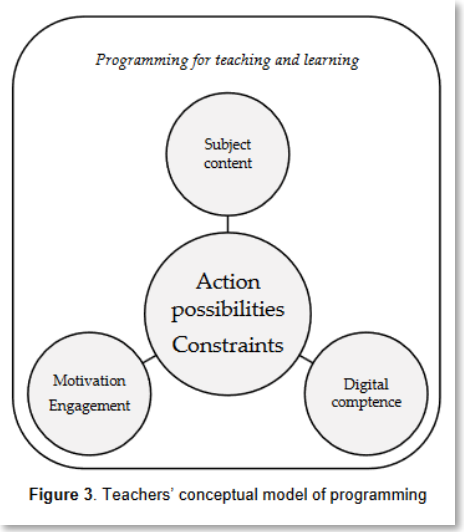


Figure 3. Teachers' conceptual model of programming

Table 5. Summary of action possibilities and constraints

	Support subject content	Facilitate motivation and engagement	Develop digital competence
Action possibilities	Variety Creativity Powerful Repeat Re-use Generalise Interdisciplinary collaborations Problem solving Less fear of errors Visualisation	Fun Playful Interesting Curiosity Adaptive Hands-on Discovery	Holistic views Deconstruction Problem-based learning Confidence Independence Error handling Technology understanding From consumer to producer
Constraints	Lack of tangible elements in subject Too difficult Too easy Too limited Prevent deeper learning Overwhelming Writing difficulties	Difficult to learn Play instead of learning Professional relevance Too childish	Application outside educational context Relevance Usefulness Potential misconceptions about skill development

Artificial Intelligence in/for Education (AIED)

Artificial Intelligence

AIED

AI in Education

SWOT Analysis

Scoping Literature Review (41)

	Helpful to achieve objectives	Harmful to achieve objectives
Internal	Strengths:	Weaknesses:
	AI for step-based teaching and learning	Stupid tutoring systems
	Natural language processing for learning-support	Biased development and training
External	AI as ecosystems	AI as ecosystems
	Opportunities:	Threats:
	AI to assist teachers	Extinction risk fears
	AI to assist students	Lack of knowledge and privacy
	Mass individualisation of education	

GenAI

ChatGPT in HE

Consequences for CS

Analytic Autoethnography

Data collection & Analysis

- Field diaries (6)
- Interactions (82)
- Thematic Analysis

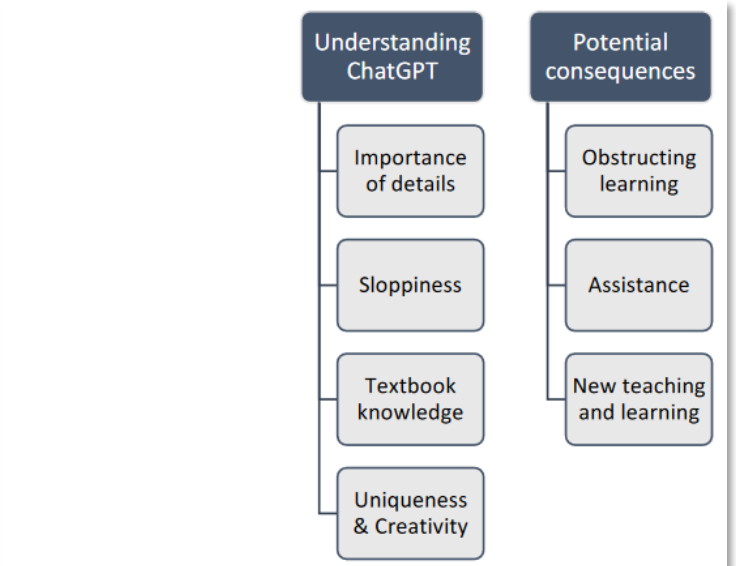


Figure 1: Overview of categories and themes

Symposium on AI Opportunities and Challenges (SAIOC) – *Education will never be the same again!*

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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)

Symposium Co-Chairs

Peter Mozelius is an Associate Professor and Researcher, working at the Department of Communication, Quality Management and Information Systems at the Mid Sweden University in Östersund, Sweden. His research interests are in the fields of Game-based learning, Artificial intelligence, Lifelong learning and Programming education.

Assistant Professor Niklas Humble is a lecturer and researcher at the Department of Computer and Geospatial Sciences at the University of Gävle, Sweden. He teaches courses in computer programming, interaction design, research methodology and writing, and supervises students at bachelor's level. Research interests include CS education, Professional development, AI, Computational ethics, Research methodology, Design science, and Game-based learning.

Jimmy Jaldemark, Associate Professor, Mid Sweden University, has worked within the field of educational technology since the 1990s. His research interest concerns collaborative, lifelong, mobile, and networked aspects of learning, including educational technologies such as AI, mobile devices and social media. He serves as editor for the *British Journal of Educational Technology.*

Programme Chair

Dr Paul Griffiths BSc, MEng, DBA, A.Dip.C is Professor of Banking, Finance and Fintech and Academic Director of the MSc in Banking and Fintech at the Ecole de Management de Normandie and is based at the UK Campus in Oxford. Prior to becoming a full-time academic Paul spent many years in leadership positions at global management consulting firms, serving Boards of blue-chip companies, particularly in the financial services sector. He specialises in the management of intangible assets such as intellectual capital and artificial intelligence. He helps organisations and industry sectors set up knowledge networks on technological platforms such as cognitive computing, augmented reality and blockchain. Having lived in nine and worked in 15 countries he defines himself as multicultural.

Keynote Speakers

Mutlu Cukurova is Professor of Learning and Artificial Intelligence at University College London. His work aims to address the pressing socio-educational challenge of preparing people for a future with AI systems that will require a great deal more than the routine cognitive skills currently prized by many education systems. Prof. Cukurova directs the UCLAT team at UCL, is engaged with UNESCO's Unit for Technology and AI in Education, was the programme co-chair of the International Conference of AI in Education in 2020 and the international conference of computer-supported education in 2022, is a Salzburg Global Seminar Fellow, is currently the Editor-in-Chief of the British Journal of Educational Technology and an associate editor of the International Journal of Child-Computer Interaction.

Sanna Järvelä is a professor in learning sciences and head of the Learning and Educational Technology Research Lab (LET) in the University of Oulu, Finland. Her research interests deal with self-regulated learning, computer supported collaborative learning and AI in education. Järvelä and her research group is internationally recognized in theoretical and methodological advancement of social aspects of self-regulated learning (socially shared regulation in learning) and multimodal research methods. She has published over 200 scientific papers in international refereed journals and about 60 book chapters and three edited books (GS h-index 72). Järvelä is a member of the OECD PISA 2025 'Learning in the Digital World' expert team, co-PI of the Center for Learning and Living with AI (CELLA) and leader of the Hybrid Intelligence: Human-AI co-evolution and learning in multi-realities (HI) research programme in the University of Oulu 2023-2028.

Virginie Hachard has been Associate Professor of Finance and Deputy Dean of the Faculty at EM Normandie since 2016. Graduated of the DESCF and from EM Normandie, she obtained her PhD in Management Sciences in 2009 from the University of Caen Normandie on the creation process of the neo-entrepreneur. For twenty years, she was responsible for coordinating teaching in the Undergraduate and Master's courses at EM Normandie, after working for an auditing firm. She currently coordinates individual and group training courses for the faculty and develops educational and digital training offers and related certifications. She is also working on the development of e-learning modules, course hybridization and the integration of artificial intelligence into courses and curricula. Her areas of research include intrapreneurship, business models, teleworking, and educational pedagogies.

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

SAIOC 2024?

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Serious Games

Serious Games & GBL

Escape with Python

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

Gaming4Coding

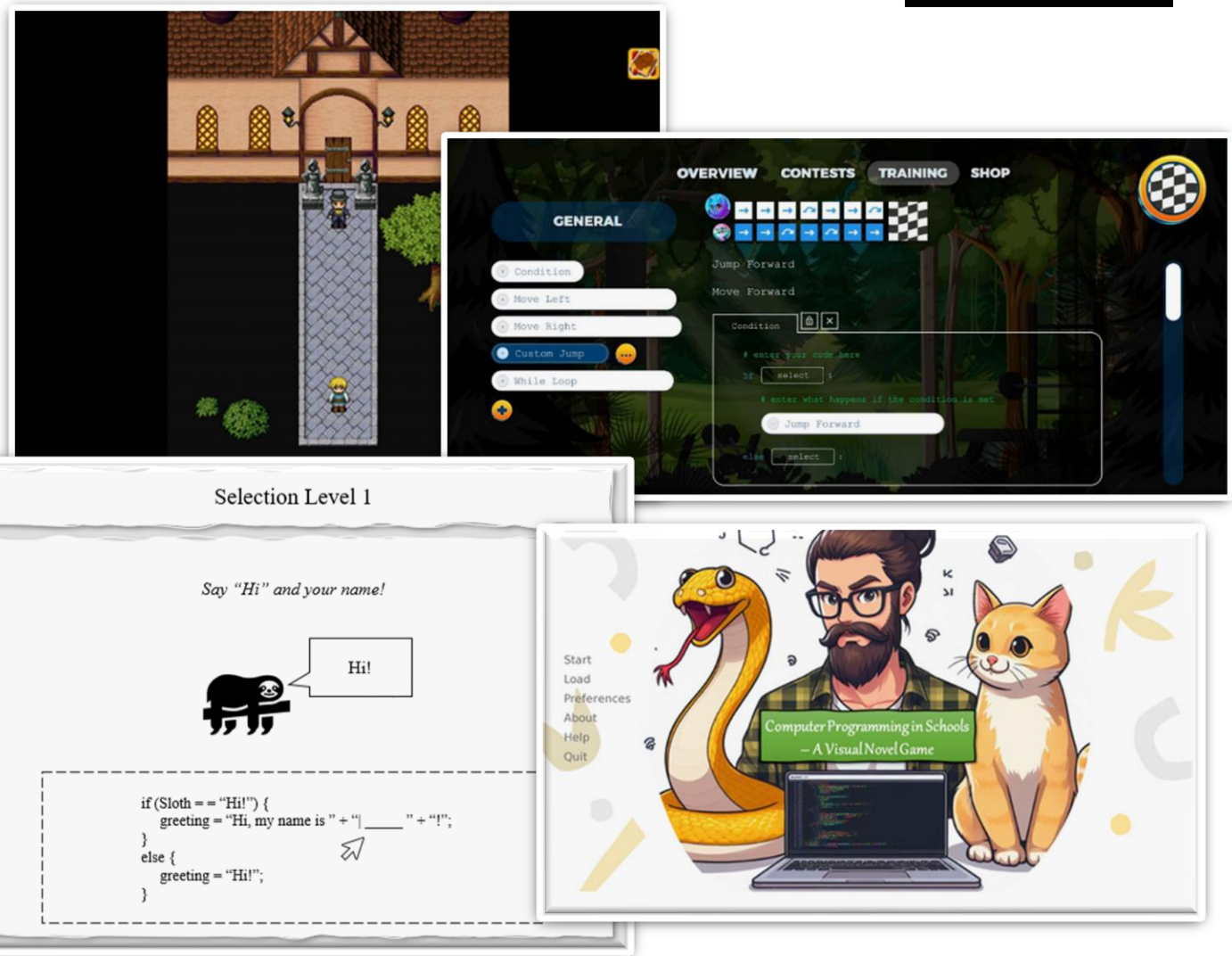
- Mid Sweden University, Universidad Complutense Madrid & Ingenious Knowledge
- Promote coding in K-12 education (especially girls)
- https://gaming4coding.eduproject.eu/

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

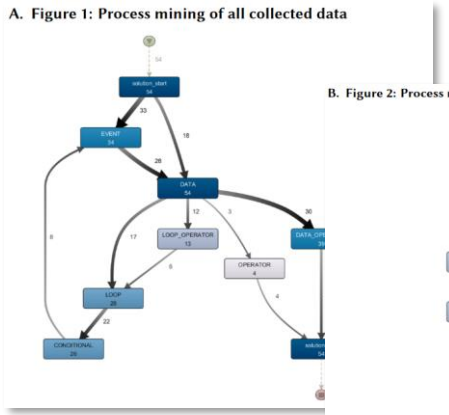
- Identify development of CT in programming solutions (35+19=54)
- Process Mining (Disco)

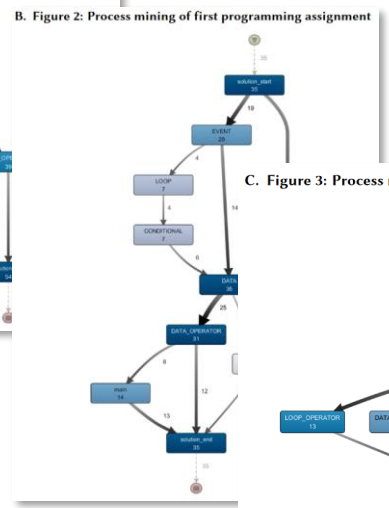
Computational Ethics

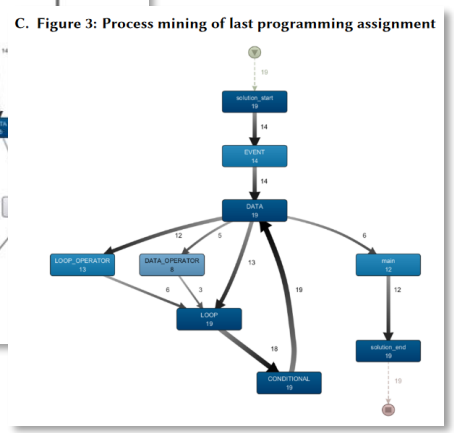
- Model for intelligent decision support system (IDSS)/AI
- Based on rule-consequentialism

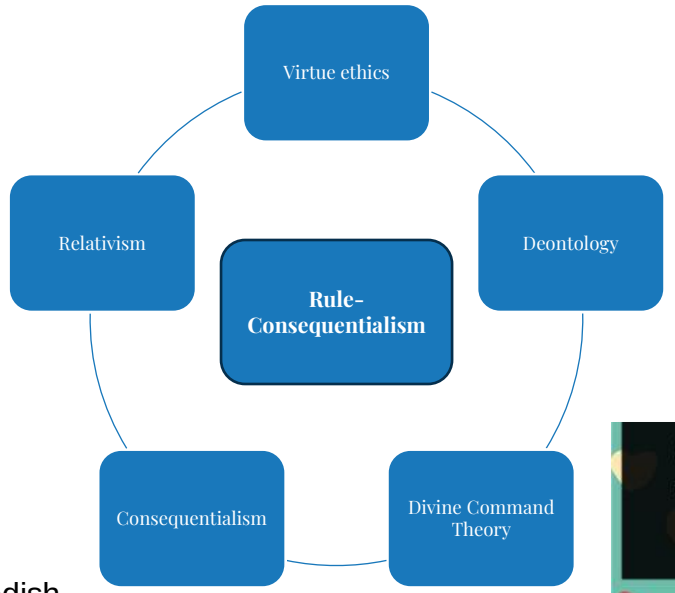
Digital Humanities

- Auto-generation grammar test (Swedish & Swedish as a secondary language)
- Language Teachers
- Web Application









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The Project:

GenAI, IT Industry & Computing Education

1 Analyze how GenAI is used and influences people in the IT industry

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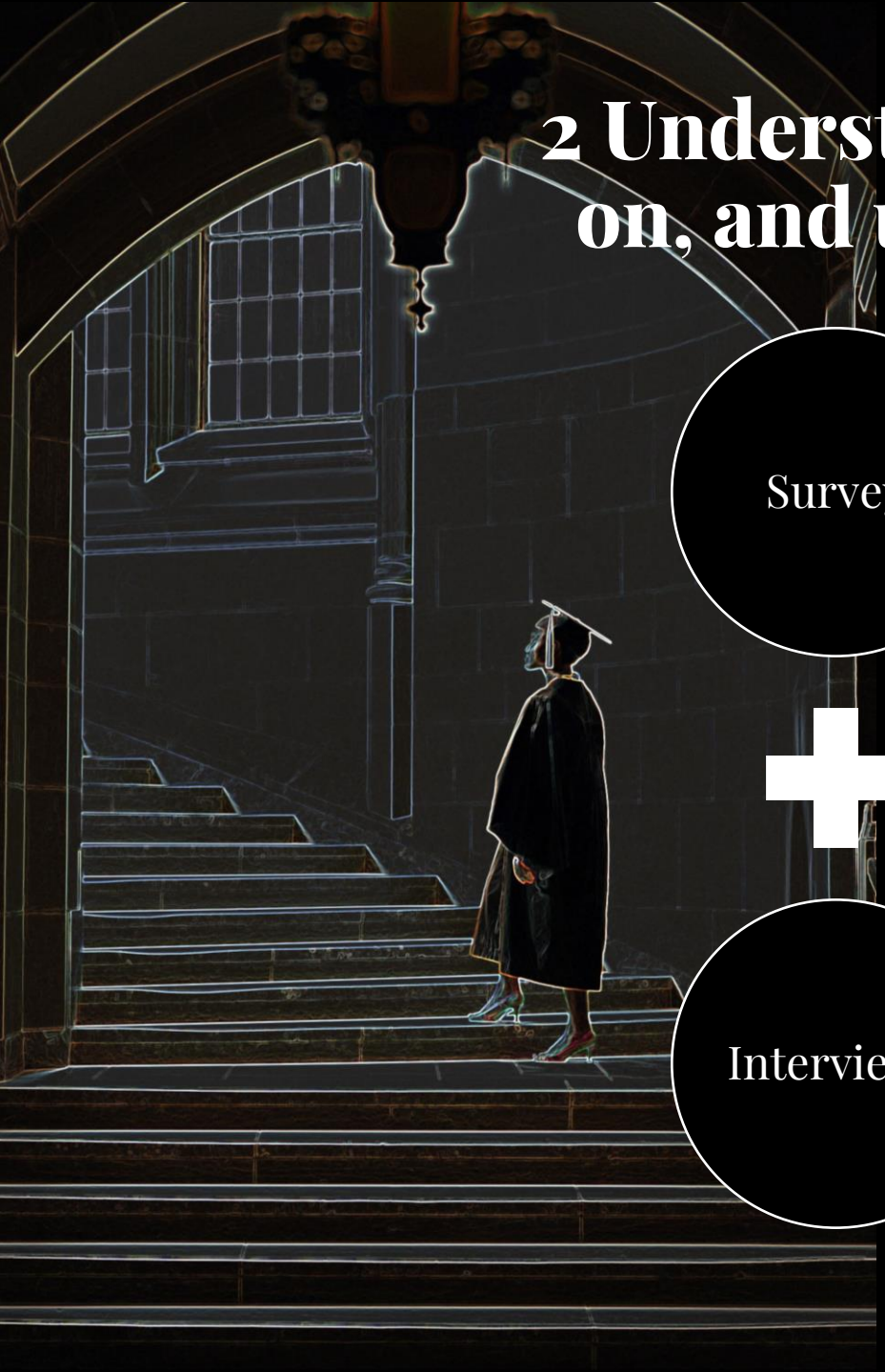
Case Study

2 Understand students' perspectives on, and use of, GenAI in education

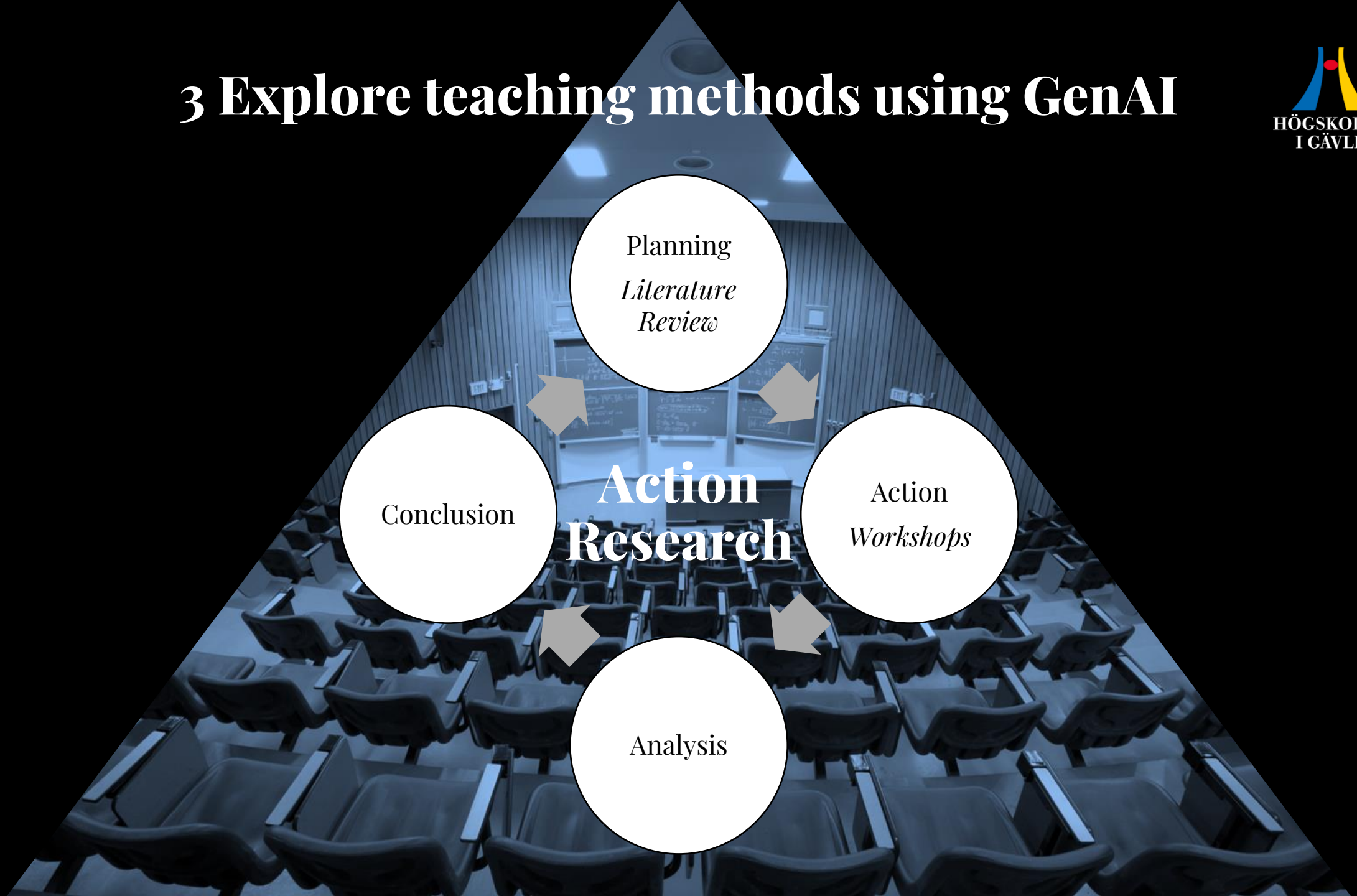


Survey

Interviews

Mixed Methods

3 Explore teaching methods using GenAI



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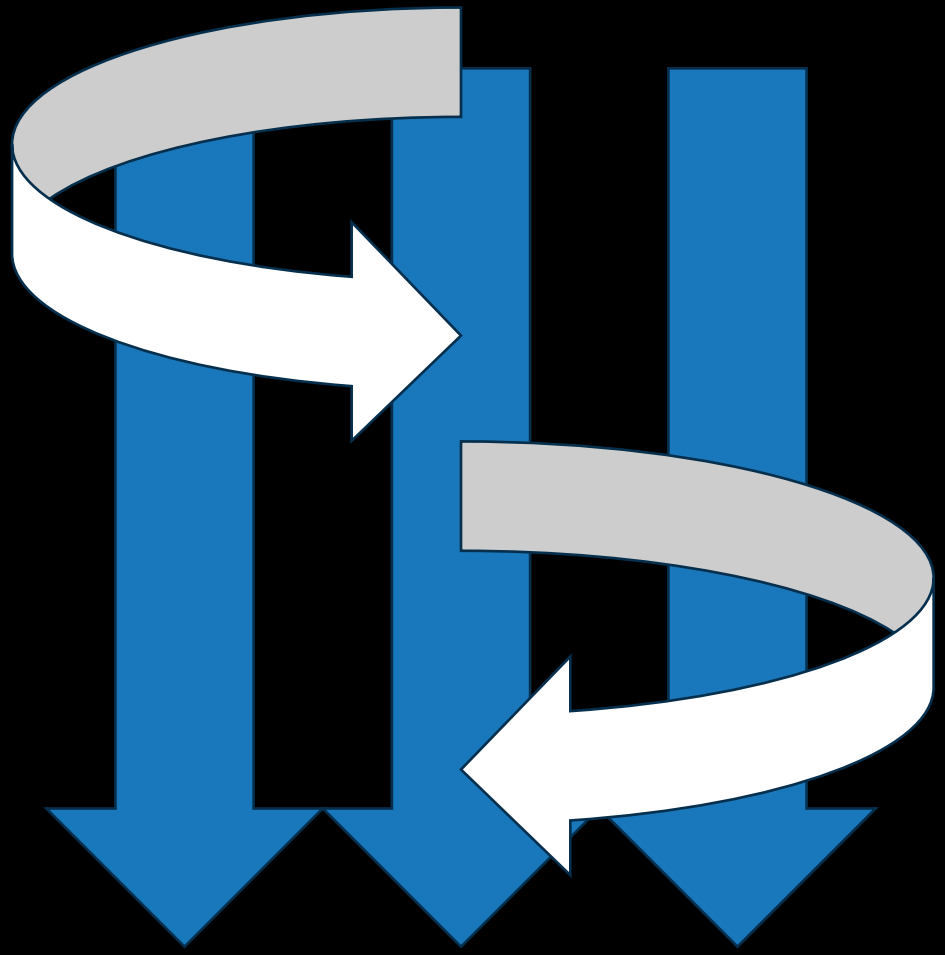


Adult Learning
(Knowles)

Affordances
(Norman)

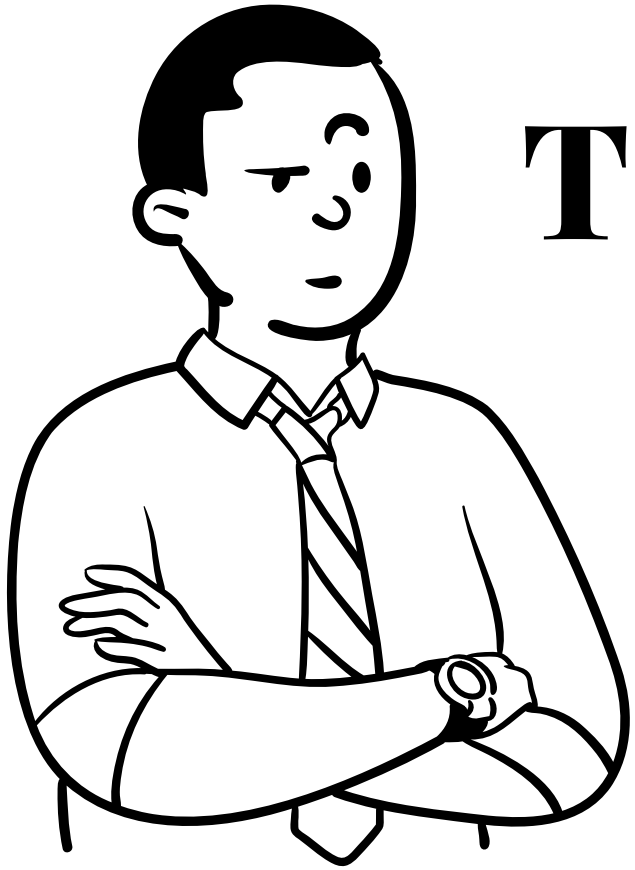
Constructionism
(Papert)

Theory?

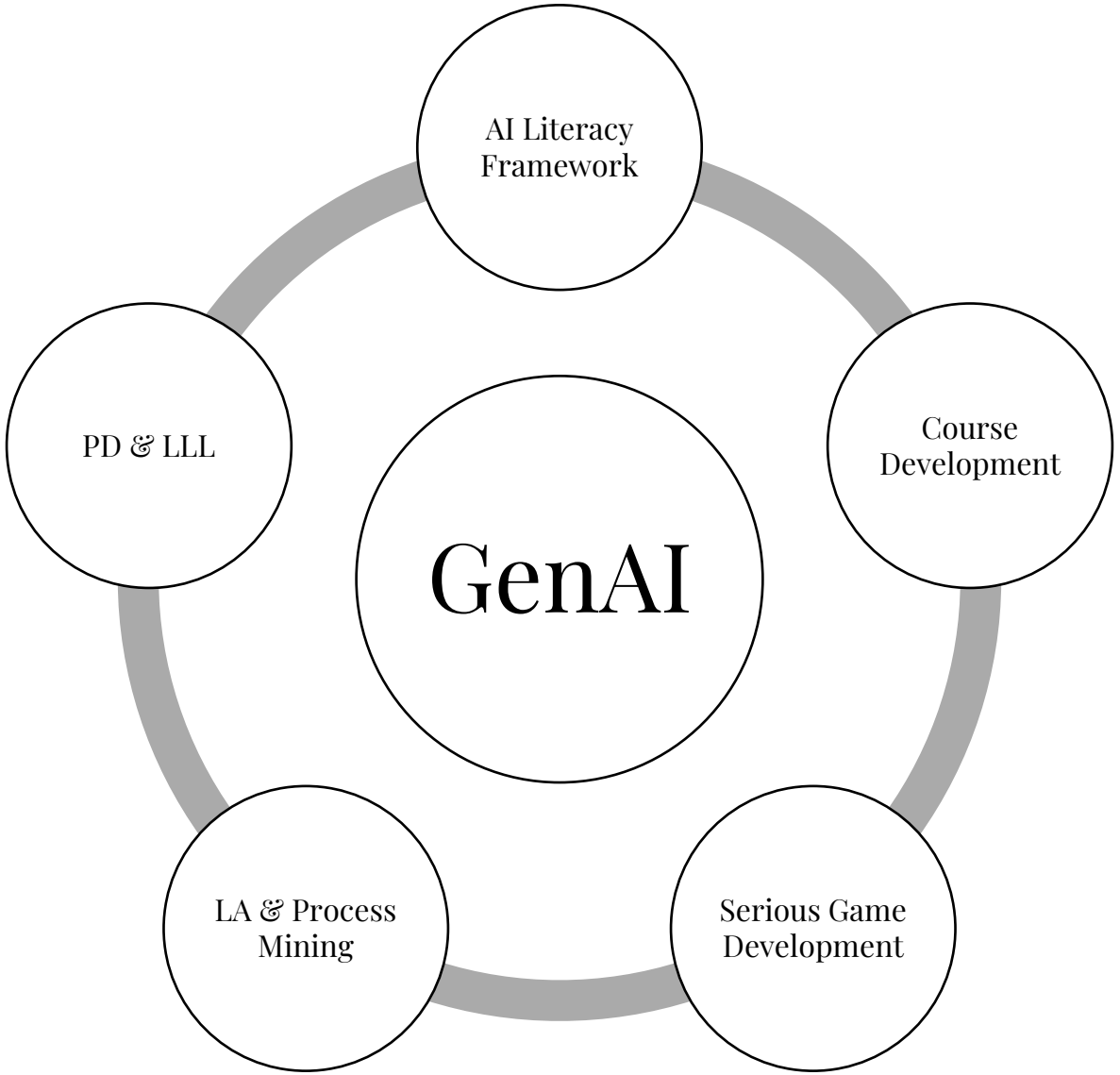
Flow Theory
(Csíkszentmihályi)

CoP
(Lave & Wenger)

Cognitive Load Theory
(Sweller)



THEN WHAT?


AI Literacy Framework
Course Development
Serious Game Development
LA & Process Mining
PD & LLL
GenAI

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Full list of publications: https://niklashumble.wordpress.com/

THANK YOU!

QUESTIONS?

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