universität innsbruck
Institut für Fachdidaktik

Themenvorschläge für Abschlussarbeiten im Lehramtsstudium „Digitale Grundbildung“

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Beschreibung des allgemeinen Betreuungsinteresses

Ich betreue Abschlussarbeiten im Feld der Informatikdidaktik, insbesondere zu Künstlicher Intelligenz in der Schule, deren Einsatz im Unterricht sowie zugehörigen didaktischen Fragestellungen. Bevorzugt werden praxisintegrierende Arbeiten (z. B. Materialentwicklung oder Unterrichtsexperimente), die ihre Fragestellungen aus dem aktuellen wissenschaftlichen Diskurs ableiten. Die Verknüpfung von theoretischer Fundierung und praktischer Anwendung steht dabei im Vordergrund; reine Literaturarbeiten sind weniger erwünscht.

Themenvorschläge für das Sommersemester 2026

Development of a Real-Time Energy Visualization App for the Mobile MINT “Energy Lab”
As part of the regional MINT initiative led in collaboration with the Regionalmanagement KUUSK, a mobile laboratory (“MINT Energy Mobile Lab”) is being developed to bring hands-on STEM learning on energy and climate directly to schools. Within this project, your task is to design and implement an application that collects and aggregates real-time watt data from five ergometer bikes during the weekly “Energy Challenge,” displaying the results in an engaging and motivating way on a large screen. The project aims to combine physical activity, knowledge building, and teamwork while making energy generation tangible through physical effort. This thesis includes active participation in the project team; a one-year employment of approximately 5 hours per week is planned in addition to the bachelor’s thesis.

Developing Unplugged AI Learning Materials for K-12 Students: A Competency-Based Approach
This thesis examines K-12 AI competencies—including algorithmic thinking and ethics—within the context of current educational research [1-3]. Based on a critical review of existing literature, the study develops unplugged learning activities [4,5]. These activities serve as a practical application of theoretical AI literacy frameworks, allowing for a systematic analysis of how foundational concepts can be effectively taught to young learners.

[1] https://dl.acm.org/doi/full/10.1145/3685680
[2] https://dl.acm.org/doi/10.1145/3313831.3376727
[3] https://ojs.aaai.org/index.php/AAAI/article/view/5053
[4] https://www.aiunplugged.org/
[5] https://www.i-am.ai/de/build-your-own-ai.html

Enhancing Pre-Service Teachers’ Explanations of Computer Science Concepts through AI-Agent Feedback
This thesis investigates how a visual or acoustic AI-agent system (such as D-ID’s AI Agents) can be used in experiments with pre-service teachers to improve their explanations of K-12 computer science content. Building on research about professional knowledge and explaining skills [1-3], the study engages pre-service teachers in explaining selected CS topics (e.g. algorithms, binary

numbers, or AI basics), receiving AI-driven feedback, and iteratively refining their explanations. The goal is to evaluate whether interaction with the AI system supports the development of clearer, more structured and pedagogically effective explanations.

[1] Kulgemeyer, C., et al. Professional knowledge affects action-related skills: The development of preservice physics teachers' explaining skills during a field experience. DOI: 10.1002/tea.21632
[2] Findeisen, S., Deutscher, V. K., & Seifried, J. Fostering prospective teachers' explaining skills during university education — Evaluation of a training module. DOI: 10.1007/s10734-020-00601-7
[3] https://link.springer.com/article/10.1007/s10758-025-09875-1
Using: D-ID AI Agents

Designing Inclusive Learning Environments: Assessing Unplugged Computational Thinking Interventions in Early Childhood

This bachelor thesis contributes to the field of inclusive informatics education by investigating how family-centered, unplugged environments can mitigate gender stereotypes in early childhood. Using a systematic design-based approach, the study develops a workshop framework that integrates computational thinking through board games and everyday play. Building on existing strategies for encouraging girls' engagement in informatics [1,2], the thesis evaluates how targeted interventions can challenge early gender biases.

[1] Miliszewska, I., & Moore, A. (2010). Encouraging girls to consider a career in ICT: A review of strategies. Journal of Information Technology Education.
[2] Şahin Timar, Z., & Mısırlı, Ö. (2023). Effective strategies for encouraging girls in informatics. International Conference on Human-Computer Interaction. Springer.