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KNOW Center

Data-Driven Business

DESIGNING REBO, THE REFLECTION GUIDANCE CHATBOT

USE CASE & MOTIVATION

Styrian SME's need an online learning platform for their apprentices in mechatronics, metal and electrical engineering.

Research opportunities:
- Apprentices as target group are under-researched
- Designing a computer-mediated learning intervention in the overlap between workplace learning and educational setting
- Contributing to research on reflection guidance technologies
- Developing the first reflection guidance chatbot

RESEARCH QUESTIONS

1. Understanding the target group

RQ1: How do apprentices use computers and how self-efficacious are they with regard to ICT?

RQ2: What characterises apprentices as a community of practice with special regard to their learner identities?

2. Designing the learning intervention with guided reflection & continuous evaluation

RQ3: How apt is the dialogue structure Rebo Junior to lead successful reflective conversations with apprentices?

RQ4: Which adaption mechanisms improve reflection guided by a conversational agent?

RQ5: Do apprentices' reflection skills improve with repeated interactions with Rebo?

METHODS

1. Apprentices' Computer Usage and ICT Self-Efficacy
   - Questionnaire study with 72 apprentices
   - Complemented with 6 in-depth interviews
2. Apprentices' Learner Identities and Community of Practice
   Semi structured in-depth interviews:
   - 8 apprentices, 3 supervisors, 3 trainers
   - Data available, analysis upcoming
3. Learning platform for apprentices → Contextual Design
4. Designing a dialogue structure that leads apprentices through successive levels of reflection: Rebo Junior
   - Experimental field studies (2x 3 months)
   - Evaluation: user acceptance, reflectivity & coherence of interactions
5. Designing Rebo, the Reflection Guidance Chatbot
   - Experimental field studies (2x 1 month, 1x 3 months)
6. Measuring apprentices' reflection competence & SRL skills
   - Pre- and post-tests: reflective essays
   - Pre- and post- surveys: self-regulated learning

Landing Page

Dashboard for Apprentices with learning areas

Area to view tasks and upload work
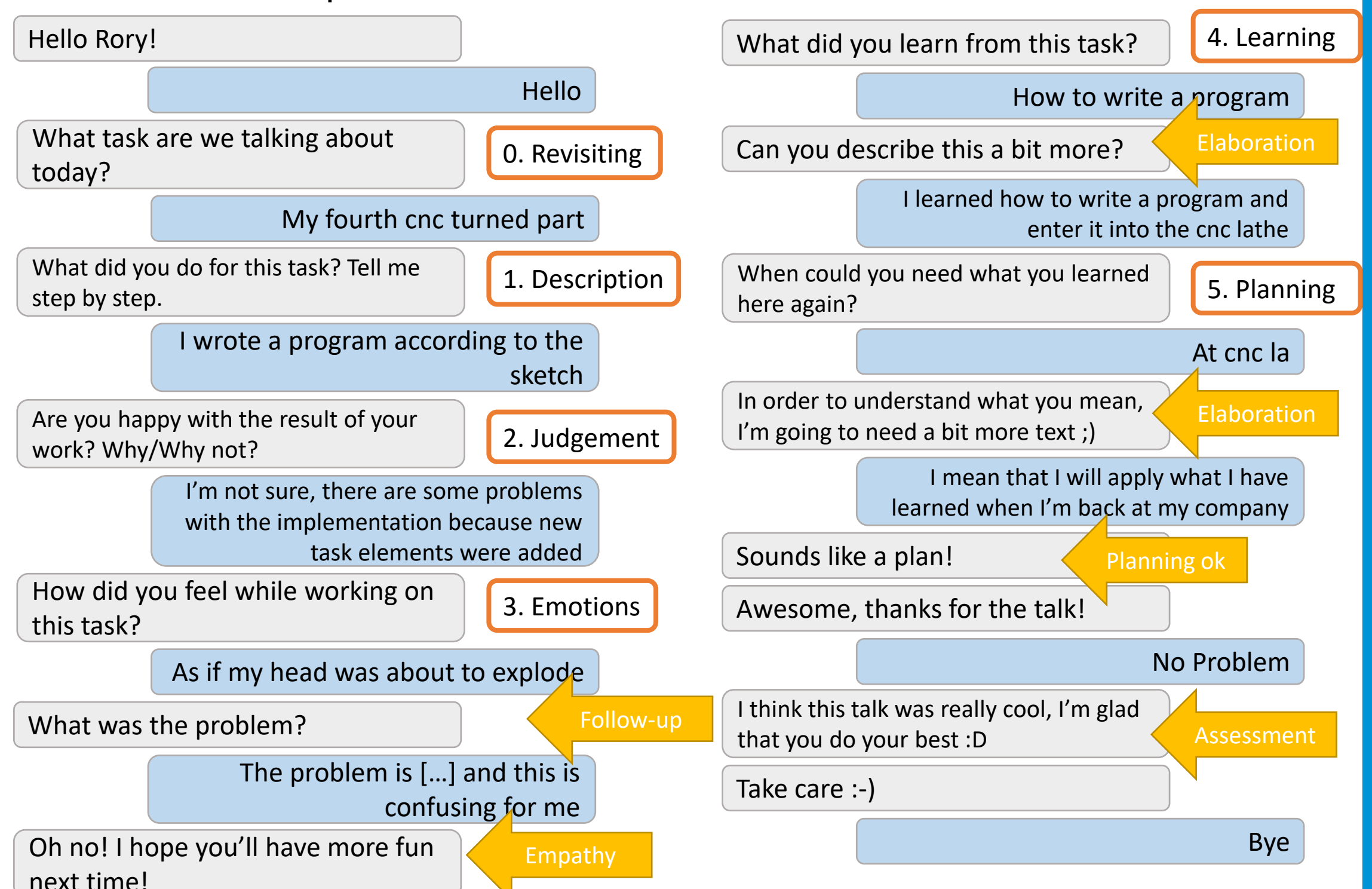
RESULTS

RQ1 (Paper in peer-review)
- Apprentices use computers regularly, for multiple hours per day
- Computer self-efficacy of apprentices is high
- Apprentices' potential to work digitally is underused in apprenticeship training

RQ3 (Wolfbauer et al. 2020)[1]
1. Apprentices (n=18) like texting with Rebo Junior!
   - Workshop feedback: 94% like Rebo, 70% see benefit
2. Interactions with Rebo Junior (153) are coherent and reflective
   - 97% coherent conversations
   - 75% reached reflection stage 2: analysis[2]
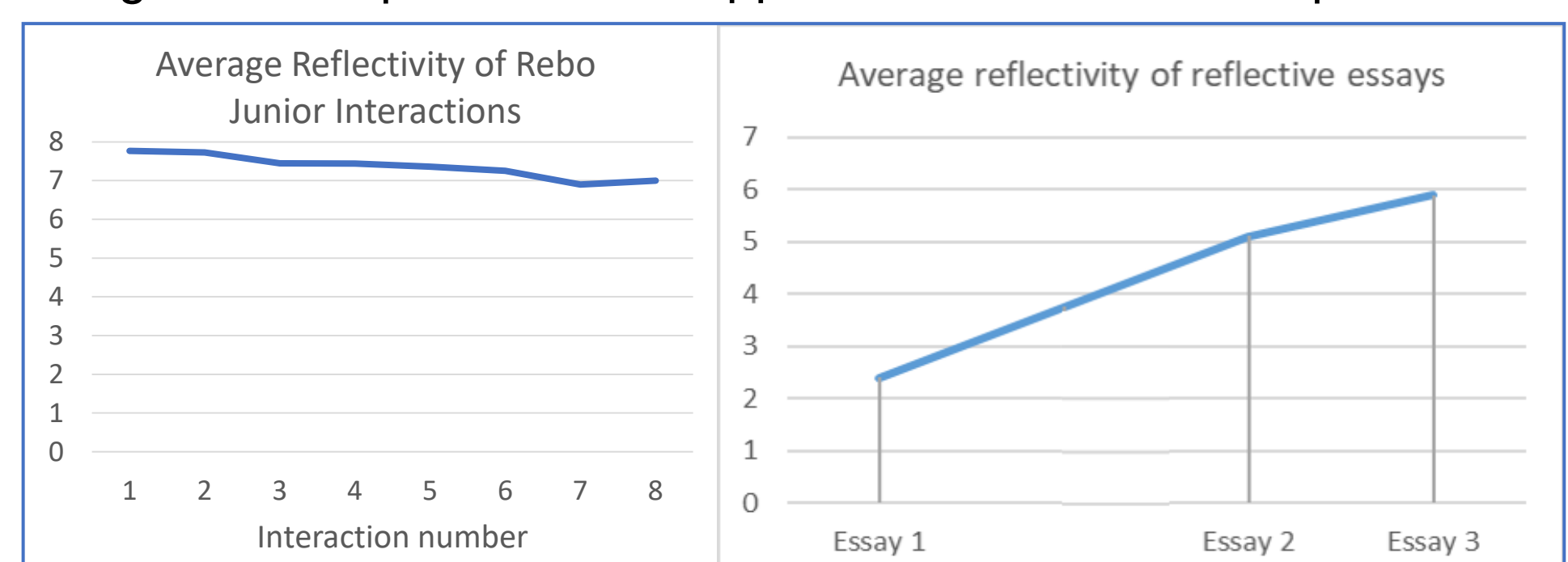   - 87% reached reflection stage 3: learning & change[2]

RQ4 (Paper in preparation)
- Adaptive turns: reflection level not achieved, explanation too short, "fake reflection", empathic reactions, assessment comment
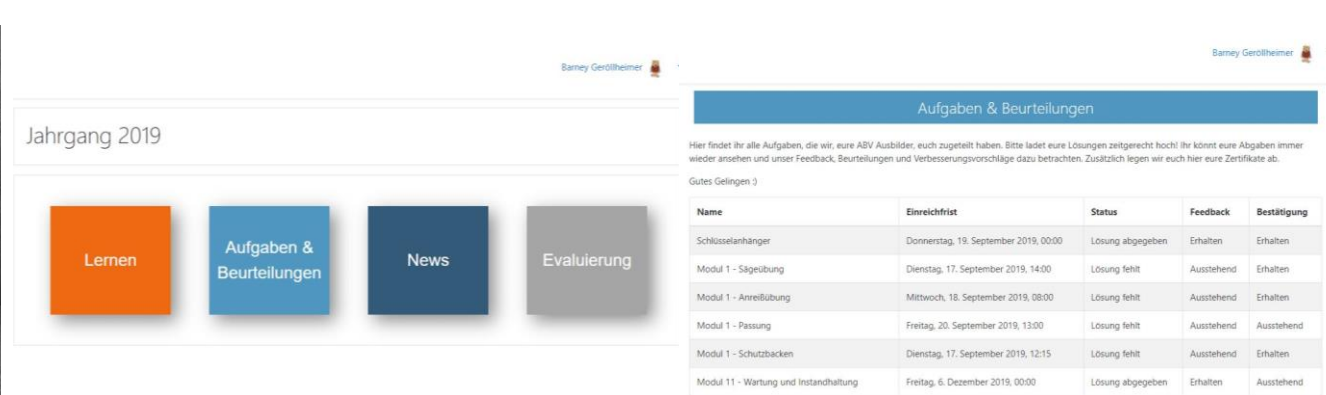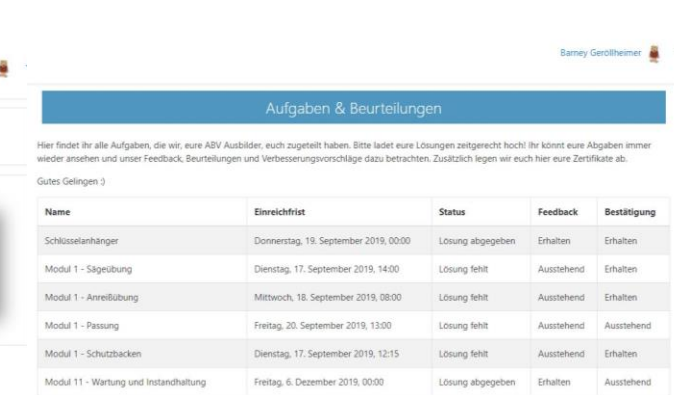

RQ5 (Paper in peer-review)
- Coding 4 reflection levels: Judgement, Emotions, Learning, Planning: (0/1/2 for each level → total scores: 0-8)
- Significant improvement of apprentices' reflection competence

Average Reflectivity of Rebo Junior Interactions

Interaction number

Average reflectivity of reflective essays

Essay 1   Essay 2   Essay 3

REFERENCES

[1] I. Wolfbauer, V. Pammer-Schindler, and C. Rose, "Rebo Junior: Analysis of Dialogue Structure Quality for a Reflection Guidance Chatbot", In Proceedings of the Impact Papers at EC-TEL (2020)
[2] M. Prilla and B. Renner, "Supporting Collaborative Reflection at Work", In Proceedings of the 18th ACM International Conference (2014)