DeloitteStiftung

Initiative D21

DIGITAL FUTURE CHALLENGE

DFC #6 – Use Case isento GmbH

isento GmbH

isento's USP: isento GmbH, an established IT service provider, is actively driving forward the education of tomorrow with its open-source robot pib. As part of this challenge, we invite you to contribute your innovative concepts for this exciting topic and help shape the future of learning at the interface of AI, robotics and education. This is your chance to make a real contribution!

Employees: 65

Industry: IT & Robotics

Thematic focus of the use case

Robotics

TITLE OF THE USE CASE

Teaching of the future: Hybrid teaching with humanoid robots to strengthen the education system

SHORT DESCRIPTION

Concept for the introduction of the humanoid robot pib as a support for teachers for the individual promotion of learners, internal differentiation and relief for teachers. Focus: Acceptance and ethical responsibility.

#HASHTAGS

#EdTech #HumanoidRobot #EducationalInnovation

DESCRIPTION OF THE ORGANISATION

As a full-service IT service provider, our core business is the development of software solutions, AI strategies and project management. Technology is at the heart of our business model. With our open-source project, the humanoid robot pib, we are specifically targeting the education sector. We see the greatest opportunity of digital transformation in addressing social challenges such as the shortage of teachers. Our culture is characterised by a passion for innovation and the pursuit of excellence.

With our pib.Education programme, we act as responsible bridge builders between technology and education in order to actively and sustainably shape the school of tomorrow.

VISION OF THE ORGANISATION

Our vision is a future in which technology makes the German education system more equitable and personalised. We strive for a world in which all learners, regardless of social background or individual learning pace, receive optimal support. Teachers should be relieved of repetitive tasks so that they have more time for personalised support and educational relationship building. Humanoid robots such as pib should be established as trusted support in everyday school life, enriching lessons and promoting internal differentiation and inclusion. In the long term, we want to establish an internationally recognised standard for the ethical and effective use of AI in school education.

PROBLEM SETTING

The German school system faces enormous challenges. The acute shortage of teachers is leading to growing class sizes and increasing workloads. This is affecting the quality of teaching, as it is becoming increasingly difficult to respond to individual needs. Differentiated support is often neglected, which jeopardises equal opportunities. In addition, the continuous training of teachers in new, fast-moving subject areas such as AI, robotics and renewable energies represents another major hurdle that is almost impossible to overcome in everyday school life. There is also a lack of time to support children with language barriers or social challenges. Innovative approaches are needed to relieve the burden on teachers and put the focus back on individual support.

QUESTION AND TASK

How can a comprehensive concept for the introduction of the humanoid robot assistant "pib" in general education schools be designed that ensures a high level of acceptance among all those involved – teachers, learners and parents?

Develop a detailed concept and roadmap for a pilot project. Take the following key questions into account:

- **Acceptance, ethics & law**: What measures build trust? How can a relationship of trust be established between learners and pib? What ethical red lines must not be crossed and what legal challenges (e.g. duty of supervision, data protection) require particular attention?

- **Implementation & timeframe**: What could a step-by-step implementation plan look like? What is a realistic timeframe? What technical and organisational requirements must schools meet?

- **Roles & tasks**: What would be a sensible division of labour? Which educational tasks can pib take on and which must remain with human teachers in order to maximise the educational added value?

ADDITIONAL BONUS QUESTION

How can we ensure that pib is perceived as a teaching assistant and not as a friendly companion?

ADDITIONAL

For example, existing guidelines, previous efforts and strategies for responsible AI, digital ethics or digital responsibility.

The humanoid robot pib is designed as a support system and is in no way intended to replace teachers. Rather, it is intended to serve as a tool that creates space for high-quality educational work.

Technical features of pib:

- **3D camera & image processing:** pib can not only recognise objects, but also understand and evaluate handwritten task solutions and help with troubleshooting.
- **Language model connection**: By connecting to large language models, pib has unlimited access to knowledge, foreign languages and current school content.
- **Connectivity**: pib can control projectors or smart TVs to clearly visualise learning content and examples.
- **Microphone array**: pib can use multiple microphones to pinpoint the direction from which speech is coming, allowing it to respond specifically to individual learners.

Further information about the humanoid robot pib can be found here: https://pib.rocks

pib.rocks has already won several awards, including the BMAS Civic Innovation Award 2023, the Munich Digital Innovation (Digicon) Award 2023, the German Innovation Award 2025 and the German Design Award 2025.

Possible application scenarios:

- **Direct teaching support**: pib can repeat standardised learning content and carry out exercises (e.g. vocabulary training) in small groups.
- **Individual support**: pib can specifically repeat basics with weaker learners or set challenging additional tasks for stronger learners.
- **Social and inclusive use**: Through gamification and non-judgmental interaction, pib can increase motivation to learn, help with language barriers or act as a calming factor in restless classes.
- **Further training for teachers**: pib can serve as interactive learning support for teachers, helping them to quickly and easily familiarise themselves with new technologies (e.g. AI).