TEASER

Teacher as Avatar

Best Practice Guide

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Contents

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I. Introduction: Shaping the digital transformation of vocational education and training

The rapidly advancing integration of artificial intelligence (AI) and avatars into the world of work, especially in high-tech industries such as chemistry, IT and mechatronics, poses massive challenges for vocational education and training (VET). While AI applications such as chatbots and interactive avatars are increasingly making their way into everyday life and industry, it is often evident that both educational staff and trainees are insufficiently prepared for this profound transformation process. The TEASER project ("The teacher as an avatar in vocational education and training") addresses this urgent need by actively channelling technological innovations into training practice.

1.1 Mission of the TEASER project: From passive user to active creator

The core mission of TEASER is to provide targeted support to vocational education and training staff in acquiring and expanding digital skills in order to ensure the learning-oriented, safe and effective use of AI chatbots and avatars in practical training. At a time when technological development is often abrupt, it is essential that teachers are not just passive consumers of software, but actively use the technical and pedagogical possibilities to design teaching and learning processes.

The project pursues the following central guidelines:

- **Strengthening digital readiness:** A step-by-step qualification concept will strengthen digital resilience and capacity in educational institutions in the long term.
- **Promotion of "Digital Pedagogy":** The use of technology is not an end in itself, but serves to solve concrete pedagogical problems according to the guiding question: "If AI and avatars are the answer, what was the question?".
- **Human-centered approach:** A fundamental principle is the avoidance of the so-called "Turing trap". This means that AI and avatars are consistently used to complement and amplify the human expertise of educational staff, rather than trying to imitate or replace human interaction.

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1.2 Objective of the guide: A compass for training practice

This Best Practice Guide acts as the central reference work of the project and bundles the experience gained during the 27-month period for a broad professional audience. It is designed as a practice-oriented "instruction manual" that enables other European educational institutions to transfer the project results into their own practice.

The guide serves as a compass for training practice by:

- The main **"lessons learned"** from the development and piloting of at least 10 tailor-made teaching and learning scenarios in the sectors of chemistry, biology, IT and mechatronics will be presented.
- Provides a **strategic framework** for the institutional adoption of AI based on the strategic dialogue between management and users developed in the project.
- Acts as a **catalyst** for the transfer of digital innovations to other sectors and EU countries in order to ensure the attractiveness of vocational education and training in the long term through modern, green and inclusive methods.

1.3 The "digital toolbox": AI and avatars as complementary assistants

The TEASER project sees itself as a comprehensive "digital toolbox" for trainers. This toolbox not only provides the technological tools – AI and avatars – but also the didactic blueprints for their use.

In the TEASER context, these focus technologies are defined and interlinked as follows:

- **Artificial intelligence (AI):** Generative AI (e.g. chatbots such as ChatGPT) is primarily used to automate the creation of teaching content, to support lesson planning or as an interactive source of knowledge for learners.
- **Avatars:** An avatar is an interactive, digital representation of a real or artificial person. It serves as the "visual face" of AI and can act as the teacher's "digital twin" to deliver guidance consistently, anywhere, and in different languages.

The role of these tools is that of a **complementary assistant**. They relieve training staff of repetitive tasks – such as standardised safety instructions on machines – which frees up valuable time for individual pedagogical support and social interaction with learners. This means that the didactic sovereignty and final control over the learning process always remains with humans, while technology serves as a powerful support tool.

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II. Strategic Framework: The Management Roadmap

Proactive adaptation to technological developments is a **strategic necessity** in order to adequately prepare trainees for the requirements of the future labour market. Successful institutional integration requires a close integration of management decisions and practical qualification.

2.1 Prerequisites for the institutional adoption of AI and avatars

Before technologies such as AI chatbots or avatars are introduced, specific **organizational, technical, and educational prerequisites** must be created.

- **Strategic consistency and guidelines:** The as-is analysis shows that although digital strategies often exist, practical implementation often remains incomplete. Concrete **guidelines** for the use of AI are therefore needed to create safety for teachers and students.
- **Technical infrastructure:** While hardware such as tablets is usually available, there is often a lack of specific **AI licenses** and an integrated digital learning environment. A **low-threshold approach** that relies on existing no-code software is crucial to minimise investment hurdles.
- **Resource allocation (time and personnel):** The identified **lack of time** is one of the biggest barriers. The management level must therefore create structural freedom for the staff in order to build up the necessary internal expertise and expertise for content creation.
- **Legal and ethical guardrails:** Compliance with the **GDPR and** transparency in the use of tools are basic prerequisites for acceptance. This also includes the development of codes of **conduct** for employees and trainees.

2.2 The Strategy Dialogue: Networking Management and Educational Staff

The **strategy dialogue** is the core of institutional anchoring, as it closes the gap between strategic management decisions (**top-down**) and practical application by staff (**bottom-up**).

- **Actors and goals:** The dialogue continuously connects decision-makers such as managing directors and department heads with users (trainers, teachers). The aim is to create a common understanding of the influence of AI on the organizational structure.
- **Moderation through core questions:** In order to make the exchange targeted, the focus is on the **core pedagogical question** : "If AI and avatars are the answer, what was the pedagogical problem we want to solve?". This approach ensures that technology is not used as an end in itself, but to solve real-world problems (e.g., relieving repetitive tasks).
- **Transparency and reflection:** The dialogue serves to openly address barriers such as lack of time or technical uncertainties and to overcome them through joint resource planning.

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2.3 Implementation Steps: From Needs Analysis to Broad Rollout

The management roadmap divides the transformation process into **four clearly defined phases** to ensure a structured introduction.

1. **Phase 1: Preparation and needs analysis:** In this phase, the quantitative and qualitative analysis of institutional needs is carried out. Stakeholder workshops serve to identify key needs and to examine the technological requirements (hardware, broadband).
2. **Phase 2: Development and planning:** Here, a detailed implementation plan is created and the selection of the necessary **"no-code" software** is finalized. The college relies on the **"software hopping" approach** to flexibly combine cost-efficient tools.
3. **Phase 3: Piloting, training and optimization:** The focus shifts to practical testing through test rounds of the teaching and learning scenarios with trainees. At the same time, the qualification of staff is carried out through blended learning offers.
4. **Phase 4: Full implementation and review:** In the final phase, the successfully tested scenarios will be extended to other professions and departments (**broad rollout**). A **semi-annual strategy check** ensures that the roadmap keeps pace with the rapid technological progress in the AI sector.

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III. Didactics & Methodology: "Pedagogy before Technology"

In the current debate about artificial intelligence (AI), the focus is often hastily placed on technical possibilities instead of questioning the actual benefit for the learning process. The TEASER project sets a conscious counterpoint here and pursues the guiding principle **of "pedagogy before technology",** which does not focus on the tool, but on the question of how trainers can be supported in a targeted manner and learning processes for trainees can be improved. A learning-oriented integration of AI and avatars can only succeed if they are understood as well-founded tools to support educational staff.

3.1 The Human-Centered Model: Avoiding the "Turing Trap"

A central conceptual foundation of the project is the deliberate avoidance of the so-called **"Turing trap".**

- **Complementing instead of substitution:** The goal is to use AI that complements and amplifies the expertise of human instructors, rather than trying to imitate human interaction or replace teaching staff.
- **AI as a digital assistant:** Avatars and AI agents are consistently defined as **digital assistants** that take on repetitive tasks – such as standardized safety instructions or the same technical explanations over and over again.
- **Didactic sovereignty:** The pedagogical decision-making power over the use of a tool remains with humans at all times; technology is merely a means to an end.
- **Creation of freedom:** By delegating standardized instructions to the AI, teachers gain valuable time freedom for individual care, social interaction and the promotion of the personal development of learners.

3.2 Digital Pedagogy: Enriching Learning Processes with Avatars

By **Digital Pedagogy** we mean a reflective and learning-oriented use of digital media that goes beyond the mere digitization of analogue content.

- **The TPACK model as a guide:** Successful implementation requires the dovetailing of specialist knowledge (content knowledge), pedagogical knowledge and technological know-how.
- **Typology of avatars:** The project distinguishes three types of avatars with different "didactic powers":
    - **Linear Avatar:** Acts as an "explanatory teacher" in instructional videos for theoretical explanations or practical instructions.
    - **Dynamic Avatar:** Serves as an interactive interlocutor for real-time role-playing and communication training.
    - **Text-based avatar:** Uses language models such as ChatGPT to simulate virtual clients in social work, for example.

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- **Didactic added value:** Avatars make it possible to bring theory to life, to practice real situations safely in a protected space and to increase the motivation of the trainees through gamification elements.

3.3 The "Educational Questions": Identification of Pedagogical Problems as a Starting Point

To ensure that technology is not an end in itself, each TEASER scenario begins with an **"Educational Question".** True to the guiding question **"If AI and avatars are the answer, what was the question?"**any technological solution must respond directly to an identified problem in training practice.

- **Problem identification:** Typical challenges are a massive lack of time on the part of staff, a lack of motivation on the part of learners in repetitive topics or the complexity of technical systems.
- **Scenario examples:**
    - *Question:* How can safety instructions in the laboratory be made more attractive and consistent? *Answer:* Use of QR code-controlled avatar videos directly at the "point of action".
    - *Question:* How can IT trainees be supported with frustrating debugging processes? *Answer:* An AI-powered "24/7 coding buddy" in the LMS.
- **Didactic anchor:** These questions act as an anchor to strategically justify the choice of media (e.g. no-code tools such as HeyGen or ChatGPT).

3.4 Changing the role of the teacher: from knowledge broker to coach and moderator

The integration of AI is leading to a fundamental **transformation of the teacher's job profile** . The focus is shifting away from pure knowledge transfer to accompanying and advisory functions.

- **Guide and curator:** The teacher supports learners in navigating the flood of information from AI and teaches critical **AI literacy** to question AI expenses and check facts.
- **Learning companion and coach:** During the implementation of scenarios, the teacher acts in the background, observes interactions and provides targeted assistance in the event of content or technical blockages.
- **Evaluators and quality assurance specialists:** Trainers check the content generated by the AI for scientific correctness and moderate reflection phases to ensure the transfer of what has been learned into real practice.
- **Ethical role model:** By dealing transparently with AI, teachers act as role models for the responsible and honest use of digital tools.
- **Learning designers:** Teachers use AI as a "professional growth partner" to design lesson plans faster and with higher quality, leaving more time for **human connection** with students.

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IV. The technology check: Low-threshold tools and no-code solutions

For the successful implementation of artificial intelligence (AI) and avatars in vocational education and training, it is crucial to understand the technological basis not only as isolated tools, but as **strategic infrastructure competence**. In order to ensure acceptance among educational staff and minimize financial hurdles, TEASER consistently relies on **no-code solutions** that are widely available and often cost-effective or even free of charge.

4.1 The principle of "software hopping": combining tools efficiently

A central technological pillar of the project is the so-called **"software hopping approach"** (also known as application hopping). Instead of developing expensive and complex individual software, the specific strengths of various existing applications are interlinked.

- **The technical chain:** The creation of an interactive avatar follows a structured sequence of steps:
    1. **Text optimization:** Raw technical manuscripts of the trainers are linguistically refined with the help of AI and converted into a didactically valuable script.
    2. **Visual creation:** An image of the avatar is created using special generators to create a visual identity.
    3. **Audio synthesis:** The optimized script is converted into a living, natural AI voice.
    4. **Animation:** Image and sound are merged into a platform that animates the avatar lip-synch.
- **Advantages:** This process enables a **programming-free solution** that can be quickly adapted to different work tasks and offers a high degree of flexibility in content generation.

4.2 Tool Overview: Generative AI (ChatGPT), Image Generators, and Avatar Platforms

As part of the TEASER project, a specific portfolio of tools has proven to be particularly effective for use in chemistry, IT and mechatronics.

- **Generative AI (ChatGPT):** ChatGPT serves as a multifunctional assistant for formulating scripts, debugging program code (e.g., in Python), and creating interactive quizzes from video transcripts. He acts as a "digital detective" or interactive "buddy" for the learners in the learning process.

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- **Image and video generators:**
    - **Midjourney / DALL-E:** These tools are used to generate high-quality and individual images for the avatars.
    - **ElevenLabs:** This platform specializes in generating highly natural voices to reduce the cognitive load of robotic voice output.
- **Avatar platforms:**
    - **HeyGen:** This web app enables fast, cost-effective production of lip-sync videos in over 40 languages (including Slovenian and Greek), which increases learners' curiosity and engagement.
    - **Synthesia:** A market-leading tool for quickly creating talking avatars directly from text scripts, especially used for linear instructional content and video tutorials.
    - **D-ID / Colossyan:** Other alternatives in the field of animation of static images or the creation of video-based training content.

4.3 Hardware Requirements: From Standard Tablets to AR/XR Integration

A major advantage of the low-threshold approach is that there is no massive need for investment in hardware for the basic application.

- **Standard devices: Commercially available** laptops, PCs, tablets or smartphones are **completely sufficient** for using the AI chatbots and retrieving the avatar videos.
- **QR code triggers:** In workshops and laboratories, physical QR codes are attached directly to the machines (e.g. CNC machines or autoclaves). The trainees scan these with their mobile devices in order to **access the instructional videos** directly at the "point of need".
- **AR/XR integration:** AR/XR glasses (e.g. Microsoft HoloLens 2) can be used **for immersive 3D experiences and spatial perception of avatars** . This makes it possible to superimpose avatars as life-size digital twins directly into the real work environment.
- **Infrastructure:** A stable Wi-Fi connection in the practical training areas is the only mandatory requirement to ensure smooth access to the cloud-based AI services.
- **Optional specialized hardware:** For advanced applications, professional **handheld scanners** (e.g., Artec Eva Lite) can be used to digitize real-world objects or people for avatar creation.

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V. Best Practices: The TEASER Challenges in Practice

Each of the scenarios presented here follows a structured pedagogical design and is firmly anchored in the European competence framework **DigCompEdu** and the **SAMR model**. The **"educational question" is always central**: the technology is only chosen after the pedagogical problem (e.g. lack of time on the part of the trainer or lack of motivation of the learners) has been identified.

5.1 Chemistry & Biology: Safety Instructions and Plant Control

In laboratory professions (e.g. biology and chemical laboratory technician), the challenge often lies in teaching complex, safety-critical process flows on expensive systems.

- **Safety instructions (autoclave & sterile workbench):**
    - **Problem:** Repetitive instruction in standard procedures ties up enormous human resources and is often passively consumed by learners.
    - **Solution:** Use of **QR code-controlled avatar videos** directly at the "point of action". Learners scan a code on the autoclave and immediately receive consistent, visually supported guidance (e.g., on how to choose the correct sterilization cycle or warn of the risk of scalding).
    - **Added value:** The trainer is relieved of standard explanations and gains time for individual support with more in-depth technical questions.
- **Plant control and calibration (LC2030):**
    - **Scenario:** The **three-point calibration** and the creation of process images at the LC2030 chemical plant.
    - **Solution:** Avatars act as **"digital twins"** of the teacher and guide asynchronously through the mathematical logic of measurement and data analysis in Excel.
    - **Result:** By combining theory (visualization principles) and practice (software operation), professional competence is strengthened, while technical hurdles are minimized by no-code tools.

Mechatronics & Workshop: Interactive Avatars for Machine Safety

The workshop training at the Šolski Center Kranj focuses on the protection of apprentices on potentially dangerous machines.

- **The interactive safety guide:**
    - **Problem:** Traditional security briefings are often theoretical and not very attractive to young people.
    - **Solution:** Use of **8 different avatars** for equipment such as CNC machines, welding machines or soldering irons. By scanning QR codes on the machine, the students receive needs-based instructions on protective equipment and emergency stop functions.
    - **Pedagogical effect** : The pilot showed that the **retention rate of safety instructions could be increased to 85%.** In addition, digital literacy is promoted through the reflective use of AI tools.

IT & Programming: AI Support for Debugging (Python) and Cybersecurity

At the SCP Academy in Cyprus, scenarios were developed that use AI not only as a medium, but also as an interactive learning partner.

- **Cybersecurity Basics:**
    - **Concept:** Avatars introduce complex topics such as phishing and malware. Learners then use ChatGPT as a **"digital detective"** to analyze real-world attack reports and verify threats.
- **Python Basics with "Coding Buddy":**
    - **Challenge:** Beginners are often frustrated by abstract coding concepts and error messages.
    - **Solution:** The AI acts as a **"24/7 coding buddy".** While avatars explain basics such as loops or variables, the learners use ChatGPT specifically for **debugging** (debugging) in the program code.
    - **Result:** The evaluation demonstrated excellent user-friendliness (4.65 out of 5 points) and a significant acceleration of the learning process.

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5.4 Pedagogical Assistance: The GPT-Supported Lesson Planner

This scenario (SI2 or "Teaser AI assistant") is primarily aimed at the educational staff themselves in order to support the **digital transformation of teaching preparation** .

- **How it works:**
    - A specialized **custom GPT agent** has been developed to support teachers in creating and evaluating lesson plans according to the DigComp 2.2 framework.
    - The assistant checks pedagogical coherence, identifies gaps in the didactic design and simulates technical justifications for optimisation proposals.
- **Massive efficiency gain:**
    - In practice, the time for creating and reviewing lesson drafts has been massively **reduced from about 40 minutes to just 5 to 10 minutes** .
    - This relieves mentors and coordinators of repetitive feedback and creates freedom for pedagogical quality development.

In summary , these best practices show that the TEASER approach **successfully avoids the "Turing trap"**: The technology does not replace the teacher, but amplifies his or her expertise and creates time for what matters by automating standard tasks – the human accompaniment of the learner.

VI. Qualification: The AVATAR. AI Online Course

The **AVATAR. AI Blended Learning course** forms the operational bracket of the project and brings together the didactic guidelines as well as the practical scenarios in a structured learning offer. The course is designed according to the principle **of "Practitioners for Practitioners"** and hosted on the project's central Moodle learning platform. The aim is to significantly increase **digital sovereignty** in the VET (Vocational Education and Training) sector.

6.1 Structure and learning modules of the blended learning offer

The qualification model follows a **step-by-step progression model** (Acquire, Deepen, Create), which ensures that the introduction of AI does not take place as a purely technological process, but as a pedagogically sound further development. The course is divided into **five modular learning units** , each combining text, video tutorials and knowledge quizzes.

The five modules are structured as follows:

1. **Module 1: How does AI work? (Basics):** This module lays the scientific foundation. It teaches the history of AI, key terminologies such as **machine learning** and **large language models (LLMs),** and the fundamentals of **prompt engineering** to generate high-quality results from AI tools.
2. **Module 2: What is an avatar? (Pedagogical Added Value):** Here the **typology of avatars** (linear vs. dynamic/interactive) is explained. The focus is on didactic added value, such as how avatars as **"digital twins"** of the teacher can increase motivation and create a safe space for errors.
3. **Module 3: How to use it? (Practical creation):** This is the technical heart of the course. Participants are guided step by step through the **"technical chain** ": from video recording to AI-optimized transcription with ChatGPT to final avatar generation using no-code tools such as **HeyGen** or **Synthesia**.
4. **Module 4: Ethical concerns? (Responsible Use):** This module addresses the legal framework (e.g. the **EU AI Act**) and raises awareness of topics such as **AI hallucinations**, transparency obligations and the ethical compass in the use of generative media.
5. **Module 5: Is it safe? (Data Protection and Security):** The final unit is dedicated to **GDPR compliance** and IT security when using cloud-based AI tools in educational institutions to ensure legally compliant operations.

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6.2 Recognition of Competences: Microcredentials and Moodle Badges

A central concern of the project is to make the individual competence growth of educational staff in the field of **digital pedagogy** formally visible and usable. For this purpose, the course uses an innovative system of **microcredentials** based on **Moodle badges**.

- **Automated certification:** The system is configured in such a way that after completing all five modules, the system automatically generates a **complete course certificate**. This document confirms the qualification as an **AI-competent teacher** and contains the name of the participant as well as the TEASER logo with the addition " **AI approved by TEASER team".** The award is technically linked to the completion of the module activities and the click on the evaluation form.
- **Quality criteria:** To receive a badge, participants must complete an appropriate exam (e.g. a quiz or practical task). A score of **at least 75%** is required for the final certification .
- **Strategic benefit:** These micro-credentials strengthen the branding of teachers as drivers of innovation and enable standardized proof of digital competencies in accordance with the **DigCompEdu Framework of Reference**.

This holistic qualification approach ensures that the project results can be transferred sustainably into the regular structures of the partner organisations.

VII. Ethical and legal guardrails

Responsible use of transformative technologies such as generative AI requires a clear compass that ensures that innovations are always in line with **European values and legal standards** . The focus is on preserving **human agency** : pedagogical sovereignty remains with humans at all times, while technology serves as a supporting instrument.

7.1 Focus on data protection: GDPR-compliant use in training

The protection of personal data in accordance with the **General Data Protection Regulation (GDPR)** is a top priority when implementing AI tools.

- **Principle of data economy:** Trainers and employees must be strictly instructed not to **enter any personal, business-sensitive or confidential information** into public AI applications such as ChatGPT.
- **Handling of biometric data:** When using avatar platforms (e.g. HeyGen), there are particular sensitivities with regard to the use of facial and voice data. The "red line" applies: the cloning of real persons without their **express, written consent** is prohibited.
- **Pragmatic solutions for practice:** In order to minimize legal risks, the TEASER model prefers to rely on **virtual persons in fictitious scenarios**. Since there is no connection to real individuals, compliance with the GDPR requirements is made much easier.
- **Institutional protection:** Before using in official courses, the organization's internal IT guidelines should always be clarified in order to create a legally secure framework for all parties involved.

7.2 Transparency and labelling requirements for AI content

An ethical use of AI requires full transparency about when and how this technology is used in the teaching and learning process.

- **Disclosure obligation:** Employees are obliged to disclose the use of AI tools and the **prompts** used to the management and the learners.
- **"AI approved" quality seal:** To signal human testing, content created in the project can be labeled with labels such as **"AI approved by TEASER team".** This creates trust and makes it clear that the results have been subjected to a final human check.
- **Dealing with AI hallucinations:** Since generative systems tend to generate factually false information ("hallucinations"), it is imperative that teachers act as experts who verify all AI outputs through **plausibility checks** .
- **Scientific accuracy vs. commitment:** Especially in safety-critical instruction (e.g. in chemistry or mechatronics), motivation through avatars must never be at the expense of **scientific precision** .

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7.3 Codes of Conduct for Employees and Trainees

In order to create commitment, the TEASER strategy model provides for the introduction of two specific codes of **conduct** , which are coordinated in the strategy dialogue with the institution's management.

1. **Code of Conduct for Employees:**
    - **Transparency:** Obligation to disclose the use of AI.
    - **Obligation to audit:** Mandatory content control of all AI-generated teaching materials and work instructions.
    - **Data protection:** Strict ban on entering students' personal data into cloud AI systems.
2. **Code of Conduct for Trainees:**
    - **Labeling:** Obligation to mark AI tools in submitted work.
    - **Proof of learning:** Demonstration of one's own learning progress and personal performance despite AI support.
    - **Critical reflection:** Training of the competence to critically question AI-generated information ("checks and balances").

These clear sets of rules ensure that the digital transformation does not lead to a loss of trust, but is designed as a **partnership process** between humans and machines, in which humans retain the final decision-making power (**avoiding the Turing trap**).

VIII. Lessons Learned: Lessons learned from the piloting

The testing phases have shown that the technological basis of the scenarios is extremely stable, which is supported by an average usability rating of **4.65 out of 5 points** . The use of AI and avatars was perceived by the majority of participants as a **significant added value** for the structuring and effectiveness of the learning process.

8.1 Acceptance factors: What motivates learners and teachers?

The pilot identified specific factors that contribute significantly to the acceptance of the new technologies:

- **Motivation of the learners:**
    - **Attractiveness and realism:** Trainees appreciate the modern, visual communication through avatars, as it corresponds to their living environment with digital screens. The link with real work tasks in the laboratory or workshop was particularly positive.
    - **Flexibility and security:** The possibility of repeating instructional videos at any time at the "point of need" via QR code supports the individual learning rhythm and lowers inhibitions about questions. Simulations also offer a psychologically safe space to make mistakes without real consequences.
    - **Engagement through gamification:** The use of avatars to guide through "quests" or to award points increases active participation and motivation.
- **Motivation of the teachers:**
    - **Massive increase in efficiency:** The biggest motivating factor for the educational staff is the time saved; for example, the planning time for teaching units has been reduced from approx. 40 minutes to **5 to 10 minutes** by AI assistants .
    - **Relief from routine tasks:** The delegation of repetitive standard instructions (e.g. safety rules on machines) to avatars creates valuable freedom for individual pedagogical support.
    - **Increased competence:** Trainers reported a noticeable improvement in their digital confidence and an expansion of their pedagogical patterns of action.

8.2 Overcoming hurdles: Dealing with lack of time and technical barriers

Despite the high level of enthusiasm in principle, critical barriers were identified in the transformation process.

- **Hurdle lack of time:** The massive lack of time resources for training is considered the biggest obstacle to widespread implementation.
    - **Solution:** A **low-threshold "no-code" approach** and the provision of step-by-step instructions and video tutorials minimize the learning curve. The formation of an internal **AI task force** also supports the structural control of the process.
- **Technical barriers:** Isolated problems occurred during the integration of specific hardware components (e.g. PLC controllers) or due to unstable internet connections.
    - **Solution:** The stabilization of QR code access and the use of the **"software hopping" approach** make it possible to flexibly switch to different tools in the event of a platform failure.
- **Barriers to acceptance:** Reservations about "dehumanization" or a fundamentally negative attitude towards AI on the part of some of the staff can slow down the rollout.
    - **Solution:** Open communication in **the strategy dialogue** and the emphasis on AI as a "digital assistant" (avoiding the Turing trap) help to reduce fears.

8.3 Quality assurance: plausibility checks and "checks & balances"

In order to guarantee the reliability and scientific correctness of the AI-supported content, strict quality assurance mechanisms were established in the project.

- **Plausibility checks against hallucinations:** Generative AI tends to so-called "hallucinations", i.e. the generation of factually incorrect but convincing-sounding answers. Teachers must therefore act as **experts** who check all AI-generated technical texts and safety instructions before use.
- **Human Agency:** A central principle is that the ultimate decision-making power over the teaching process always remains with humans. AI serves to amplify human expertise, not to replace it.
- **Transparency and labeling:** To promote trust, disclosure of AI use to learners is essential. Content can be labeled with labels such as **"AI approved by TEASER team"** to signal that a human final inspection has been carried out.
- **Continuous monitoring:** A regular review (e.g. bi-annually) of the management roadmap ensures that the chosen strategies and tools keep pace with the rapid technological development.

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IX. Conclusion and Outlook

The TEASER project marks an important step towards the full integration of intelligence-centric applications into hybrid learning environments. By consistently emphasizing the principle of **"pedagogy before technology",** it was shown that AI systems and avatars do not replace teachers, but complement and strengthen their expertise by relieving them of administrative and repetitive tasks. This human-centered approach is the basis for a sustainable digital transformation that preserves human agency in the learning process.

9.1 Consolidation of the results in one's own institution

- **Management roadmaps as a binding roadmap:** The roadmaps developed in work package 2 will make the use of AI and avatars strategically and organizationally permanent in the management processes of the partners. A **semi-annual review** ensures that these strategies keep pace with rapid technological leaps, such as generative 3D environments.
- **The ambassador model:** The trainers directly qualified in the project act as **digital ambassadors** within their organisations. They pass on their technical and pedagogical know-how to colleagues and thus support an institution-wide transformation from the bottom up. The partners are constantly reviewing the transfer of the content into their regular continuing education offerings.
- **Permanent knowledge archive:** The official project website will continue to be operated permanently by SBG Dresden as a **central information hub** . All material results, including the 10 subject-specific learning scenarios and the online course, remain freely accessible there as **Open Educational Resources (OER**).

9.2 Transfer potential to other sectors and EU countries

The TEASER approach has been designed from the outset to act as a **transfer catalyst** for a wide range of industries and the entire European Education Area.

- **Scalability through OER strategy:** Since all results are published under the **CC BY NC SA license** , third parties can copy the content in a legally compliant manner, adapt it and further develop it for their own contexts.
- **Cross-industry applications:** Beyond the focus occupations (chemistry, IT, mechatronics), enormous potential for other sectors has been identified. **Dynamic avatar solutions** are particularly suitable for the following areas:
    - **Sales training:** Simulate difficult customer conversations with interactive avatars.
    - **Human Resources:** Training of job interviews in a protected but realistic space.
    - **Social Work:** Interactive simulations with virtual clients (e.g. "Mrs. De Vries") to practice professional conversation techniques without real consequences.
- **Low-threshold access as a success factor: The** "software hopping" approach **demonstrated in the project** massively lowers the inhibition threshold for other institutions. The realization that high-quality AI learning environments can be created

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without programming knowledge (**no-code**) is activating experts throughout Europe to plan their own pilot projects.

- **Transnational network and standardization:** The orientation towards European reference frameworks such as **DigCompEdu** and the UNESCO AI Competency Framework ensures that the TEASER qualification approaches are internationally compatible and comparable. Through the presence in networks such as **EfVET,** the results were transferred directly to the leading European vocational training centres, which strengthens the attractiveness of modernised training occupations in the long term.

X. Resources and checklists for direct transfer

In order to actively channel the technology-induced pressure to change, TEASER provides structured tools that support the transition from passive tool users to reflective designers of digital learning environments.

10.1 Step-by-Step Guide: Creating Your Own Avatar

The creation of an avatar follows the low-threshold **"software hopping approach" established in the project**, in which various no-code tools are interlinked with each other without any programming effort.

1. **Define concept & mission:** Every project begins with an "Educational Question". Define the pedagogical problem (e.g., lack of time in repetitive safety briefings) and the role of the avatar (e.g., tireless assistant or safety trainer).
2. **Scripting & text optimization:** Create a raw technical manuscript and have it linguistically refined by generative AI (e.g. ChatGPT). **Golden rule:** Write short, concise sentences and avoid complicated nested sentences to keep the cognitive load on learners low.
3. **Choose visual identity:** Use specialized platforms like **HeyGen** or **Synthesia** to choose an avatar. **Important caveat:** For privacy reasons, preferably use stock avatars or create an avatar of yourself; cloning real third parties without their explicit consent is prohibited.
4. **Audio synthesis:** Import the optimized script into a speech generation tool (e.g. **ElevenLabs**) to create a high-quality, natural AI voice. This is crucial for acceptance and learning psychology.
5. **Animation & Production:** Merge image and sound in the avatar platform. Use the **preview function** to check the lip sync and emphasis before the final "Submit" click.
6. **Distribution:** Upload the finished video to a repository (e.g. YouTube) and link it via **QR code** directly at the "point of need" in the workshop or laboratory.

Prompt Engineering for Instructors: Tips & Tricks

Prompt engineering has been identified as a key skill to use AI as an efficient "pedagogical advisor" for lesson planning. A good prompt controls the quality of the output significantly ("garbage in, garbage out").

- **Role assignment (persona):** Give the AI a clear identity. *Example:* "Act as an experienced instructor for mechatronics and create a lesson plan according to the DigCompEdu framework".
- **Define context and target audience:** Specify prior knowledge and industry. *Example:* "Explain three-point calibration for chemistry trainees in the 2nd year of apprenticeship".
- **Require structured formats:** Require tables, bullet points, or specific file formats (e.g., Markdown for LMS imports).
- **Iterative approach:** Use AI for **Expert Reasoning Simulations** to question didactic decisions and receive suggestions for optimization. This can massively reduce the planning time from 40 to less than 10 minutes.
- **Quality assurance:** Always perform **plausibility checks** to detect AI hallucinations (misinformation) before sharing content with learners.

10.3 OER Repository: TEASER Knowledge Base Links and Video Tutorials

All material project results are available as **Open Educational Resources (OER)** under the free license **CC BY NC SA** , which enables legally compliant further use and adaptation.

- **Central project website:** http://www.sbg-dresden.de/aktuelles/projekte/teaser – The information hub for downloading the strategy guide, the didactic guidelines and all 10 learning scenarios in five languages.
- **AVATAR. AI Online Course:** Direct access via the Moodle LMS of SBG Dresden (https://moodle.sbg-dresden.de/course/view.php?id=85).
- **TEASER YouTube channel:** Central video archive with all lip-synched subtitled avatar learning videos and video tutorials on avatar creation.

Final practical note: Use these resources to act as a **digital ambassador** in your institution and actively drive the transformation from media to intelligence-centricity.