My Robot, My LearnMate

Training Plan

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CONTENT

1. Introduction

The integration of humanoid robots into primary education offers exciting opportunities to enrich teaching and learning, foster digital literacy, and engage students in meaningful, future-oriented learning experiences. However, to ensure successful adoption and pedagogical impact, educators need targeted support and training. This document presents the training plan developed within the MyRobot MyLearnmate project, aimed at equipping elementary school teachers with the necessary competencies to confidently use humanoid robots, specifically NAO, in diverse classroom settings.

The purpose of this report is to provide a **comprehensive overview of the design, content, and structure of the training program**. It outlines how the program was co-created through participatory design activities with educators across Europe and tailored to the diverse needs of teachers with varying levels of experience, subject specializations, and teaching contexts. The training program emphasizes both technical proficiency and pedagogical integration, with a strong focus on designing and applying teaching scenarios that promote sustainability and cross-curricular learning.

The report is structured into these main **sections**:

- **Section 2** documents the *co-creation* process, including insights from a large-scale teacher survey and participatory design activities based on the Design Thinking methodology.
- **Section 3** defines the *target groups* of the training program and discusses key factors influencing the training design, including subject area diversity, teaching experience, and inclusivity.
- **Section 4** outlines the *overall purpose* and *learning objectives* of the training, including general goals and specific aims for each of the three core modules.
- **Section 5** provides a detailed breakdown of the *training modules*, organized into thematic units:
    - **Module 1** offers a general introduction to educational robots and their ethical implications.
    - **Module 2** covers the technical aspects of setting up and using the NAO robot.
    - **Module 3** focuses on the design, adaptation, and implementation of teaching scenarios, with emphasis on sustainability education.
- **Section 6** describes the *mode of delivery*, learning environment, and certification process.
- **Section 7** lists the *resources needed* for implementation, including hardware, software, and digital platforms.
- **Section 8** summarizes the *expected outcomes* for participating teachers, covering pedagogical, technical, and collaborative competencies.
- **Section 9** includes *appendices* with supplementary materials, templates, and references to support implementation.

This training plan serves as both a **roadmap** and a **practical guide** for institutions and educators aiming to adopt humanoid robots in education. By focusing on modularity, multilingual accessibility, and inclusive design, the program ensures scalability and adaptability across diverse European contexts.

2. Training Plan Co-Creation

The *MyRobot MyLearnmate* project aims to empower educators to meaningfully integrate educational robotics—specifically the humanoid robot NAO—into classroom teaching, with a particular focus on sustainability and climate change. To ensure the training plan is evidence-based, inclusive, and user-centered, its development was informed by two key components: a **teacher survey** and a **co-creation activity** using **Design Thinking**. This two-phase approach ensures that the training content and structure are directly aligned with the needs, challenges, and preferences of teachers from diverse educational contexts.

2.1 Results from the Teacher Survey

To establish a grounded understanding of current practices, challenges, and expectations regarding educational robotics (ER), a teacher survey was conducted. The survey was informed by an extensive literature review on educational technology adoption and ER and was designed to capture both quantitative and qualitative insights across four main areas:

1. **Demographic Characteristics**: Age, school type, teaching experience.
2. **Familiarity and Experience**: Prior experience and training in humanoid robots.
3. **Motivation and Perception**: Perceived benefits, barriers, and attitudes toward adopting robots in education.
4. **Training Preferences**: Desired formats and materials for professional development.

The survey employed a combination of single-choice, multiple-choice, rating-scale, and open-ended items. It was developed in alignment with established definitions and classifications from existing literature, including robot typologies and roles in education. Key terms, such as "humanoid robots", were clearly defined based on established sources to minimize misinterpretations.

Before full distribution, the survey underwent **pilot testing** with a small group of teachers to assess usability, eliminate redundancy, identify ambiguous items, and confirm the appropriate length. Ethical protocols were followed, ensuring **anonymity**, **informed consent**, and **compliance with data protection regulations**.

To maximize accessibility, the survey was **translated into national languages** and disseminated through **national networks** in Portugal, Poland, Croatia, and Germany. A **convenience sampling** method was used, relying on teacher networks for further distribution. While this method supported wide reach, it also introduced a potential **self-selection bias**, possibly overrepresentation of educators already interested in technology.

Survey Respondents

The survey received a total of **849 valid responses**:

- **Portugal**: 333
- **Croatia**: 278
- **Poland**: 211
- **Germany**: 27

Respondents were primarily from:

- **Primary education**: 59%
- **Secondary education**: 32%
- **Higher education**: 9%

Demographically:

- **Female teachers** represented 74.6% of respondents, consistent with broader trends [14].
- **Generation X** (born 1965–1980) made up the majority (60.3%), followed by **Millennials** (22.6%).
- **82.7%** had more than 10 years of teaching experience.
- Most taught in **Humanities** (41.3%) or **STEM** (37.3%).

Spearman's correlations indicated sampling imbalances across countries in terms of age group ($r = .216$, $p < .001$) and teaching experience ($r = -.277$, $p < .001$), suggesting some contextual limitations but valuable practical insights.

Key Findings

A critical insight from the survey was the **lack of prior experience, training, and guidelines** for ER in education:

- **59.1%** of teachers reported **no experience** with robots.
- **58.9%** indicated **robots had never been used** in their schools.
- **88.3%** had **no prior training** in ER.

Self-assessed proficiency with educational robots:

- **27.3%** identified as **beginners** (familiarity, no practical experience).
- **8.8%** as **functional users** (used robots in classrooms).
- **3.5%** as **advanced users** (can support others).
- **1.3%** as **experts** (can teach/train others).

When asked about their **preferred type of training materials**, the respondents from all countries prioritised:

1. **Step-by-step lesson plans**
2. **Case studies and best practice examples**
3. **Video tutorials**
4. **Guidance for independent learning**
5. **Ready-to-use activities for students**

These results demonstrate a strong need for **accessible**, **practical**, and **motivating training opportunities**, directly guiding the design of the next development step: the co-creation activity. Teacher preferences reflect a preference for **hands-on, easily deployable resources** that can be directly integrated into classroom settings to facilitate **learning from real-world applications and successful implementations**.

2.2 Co-Creation Activity Using Design Thinking

Based on the survey findings, a **Co-Creation Workshop** was conducted to collaboratively design a training plan tailored to teachers' real-world contexts and needs. The workshop employed a **Design Thinking** methodology, an iterative, human-centered approach that emphasizes empathy, creativity, and collaboration. Its aim was to ensure that the resulting training plan would not only address the lack of experience and confidence identified in the survey but also provide practical, engaging, and sustainable approaches for integrating NAO in teaching.

A. Objectives of the Co-Creation Activity

- Co-design a training plan that is practical, inclusive, and innovative.
- Equip teachers with the necessary skills to integrate NAO effectively.
- Align training content with sustainability and climate change education.
- Foster a user-centered approach based on real teacher experiences and needs.

B. Design Thinking Phases

The workshop followed the five standard phases of the Design Thinking process:

1. **Empathize** – Understand users' challenges (teacher personas).
2. **Define** – Articulate core goals and problems.
3. **Ideate** – Brainstorm creative training formats.
4. **Prototype** – Build initial training module outlines.
5. **Test** – Present drafts and receive peer feedback.

C. Co-Creation Workshop Agenda

The activity took place over a **half-day (4-hour)** session. Each segment built upon the previous one to ensure iterative integration of insights.

Time	Session	Description

15 minutes	Intro & Icebreaker	Welcome, objectives, and sharing visions for educational robotics.
45 minutes	Empathy Stage: Define User Needs	Creating teacher personas to explore needs and challenges.
30 minutes	Define Stage: Mapping Goals	Collaborative goal setting and prioritisation.
60 minutes	Ideate Stage: Creative Solutions	Brainstorming ideas for training content and formats.
60 minutes	Prototype Stage: Build the Outline	Designing blueprints for training modules in small groups.
30 minutes	Test Stage: Present & Feedback	Presenting prototypes and gathering peer feedback for refinement.

This structured, participatory design process ensured that the final training plan would be not only pedagogically sound and innovative, but also practically relevant and responsive to teachers' voices and classroom realities.

3. Teacher Training Program Design

The training plan is designed to support a diverse range of school teachers, reflecting the varied profiles identified in the teacher survey conducted across Portugal, Poland, Croatia, and Germany. Understanding the characteristics and needs of these target groups is essential to ensure the training modules are relevant, accessible, and impactful.

3.1 Target Group

The teacher training program is designed to address the needs of two primary target groups: **trainers** and **teachers**. While both groups are composed of practicing educators, they differ in their roles within the training structure and in the level of engagement expected throughout the program.

Trainers are teachers who participate in the training program first, with the explicit aim of becoming multipliers. They undergo the full course experience, including in-depth modules

on both pedagogical strategies and the technical integration of humanoid robots into teaching. Beyond their own learning, trainers are equipped with additional materials and guidance on how to facilitate training sessions for their peers. Their role is pivotal to the scaling and sustainability of the program, as they ensure that the knowledge and practices introduced during the training can be disseminated within their local educational communities. Trainers may also contribute to contextualizing and adapting training content based on local needs, curricula, and languages.

Teachers, in contrast, are the educators who receive the training through workshops or sessions led by the trainers. This group includes a wide variety of professionals from different subject areas and school levels, as reflected in the teacher survey. They engage primarily with the core content and practical activities of the training modules, focusing on how to apply the learned concepts in their own classrooms. Teachers benefit from the localized support and mentorship provided by the trainers, which fosters a sense of community and promotes sustained implementation of humanoid robot-supported teaching scenarios.

Together, trainers and teachers form a learning model that ensures both effective training delivery and high impact. The distinction between these groups is essential for structuring the training content, timing, and support systems effectively.

3.2 Subject Areas and Educational Levels

Both trainers and teachers are practicing school educators in a range of different subject areas. Survey respondents taught across multiple **subject areas**, with the majority belonging to:

- **Humanities:** Teachers in this group often approach technology integration from a perspective emphasizing critical thinking, ethics, and social implications. Training content for these educators highlights the potential of humanoid robots to support interactive learning and foster student engagement in humanities topics.
- **STEM (Science, Technology, Engineering, Mathematics):** STEM teachers are a core target group due to their natural affinity with technological tools. These teachers often seek practical, hands-on applications of humanoid robots to enhance learning in coding, robotics, and scientific inquiry.
- **Social Sciences:** Educators in social sciences may use humanoid robots to explore social interaction, communication, and behavioral studies. Training materials address these specific contexts, highlighting inclusive teaching scenarios and the robots' role in social learning.

Moreover, both trainers and teachers targeted by our program will be practicing educators in different **levels of school education**. The teacher survey respondents primarily taught at the following educational levels:

- **Primary Education:** Training materials for primary educators focus on age-appropriate robot interactions, play-based learning, and foundational STEM skills.
- **Secondary Education:** Secondary teachers receive content emphasizing subject-specific applications, integration into curriculum standards, and development of critical thinking skills through robotics.
- **Higher Education:** For university-level educators, the training addresses advanced robotics concepts, research integration, and preparation of future teachers.

3.3 Professional, Generational and Gender Diversity

We expect both trainers and teachers to have a wide range of **professional experience** and come from different **generations**, which may affect attitudes and use of technologies such as robots and AI. The teacher survey highlighted that the majority of teachers (82.7%) have **more than 10 years of teaching experience**, and a significant proportion belong to **Generation X** (60.3%), followed by **Millennials** (22.6%). This diversity in experience and generational background requires a training approach that:

- Respects and leverages extensive teaching experience, linking new technologies with established pedagogical knowledge.
- Addresses varying familiarity with digital technologies, offering differentiated support for participants less experienced with robots or digital tools.
- Recognizes generational differences in technology adoption and motivational factors, tailoring engagement strategies accordingly.

Moreover, the sample of teachers who participated in the teacher survey reflected a **gender imbalance in school education**, with approximately 75% female and 25% male respondents. This distribution mirrors broader trends in education, particularly in primary and humanities teaching. The training plan acknowledges this context by promoting inclusive practices and encouraging diverse participation in robotics education.

3.4 Robot Experience Levels

We expect both trainers and teachers to have different **experiences in using robots and AI in education**. Teachers' **familiarity with humanoid robots** reported in the teacher survey varied substantially:

- **Beginners (27.33%):** Teachers familiar with the concept but with no practical experience using robots in the classroom. The training introduces foundational concepts and step-by-step guidance to build confidence and skills.
- **Functional Users (8.83%):** Educators who have used robots in teaching but are still developing proficiency. Modules for this group focus on enhancing practical competencies and exploring more advanced applications.
- **Advanced Users (3.53%):** Teachers capable of assisting others and integrating robots effectively. Training for advanced users emphasizes leadership, peer mentoring, and innovation in lesson design.

- **Experts (1.3%):** Those who can train others and lead robotics education initiatives. This group benefits from specialized content on cutting-edge research, policy implications, and co-creation activities.

3.5 Implications

Based on the analysis of the target group, the key implications for the design of the teacher training program include:

A. Design for Diversity

The training plan targets teachers with **diverse backgrounds** in subject matter, teaching experience, robot familiarity, educational level, and gender. The diverse characteristics of teachers revealed by the teacher survey carry important implications for the design and implementation of the teacher training program:

- The **wide range of subject areas**, from humanities to STEM, necessitates a flexible, interdisciplinary training approach. Modules must be designed to offer both general foundational knowledge and subject-specific applications to ensure relevance and practical value across disciplines.
- The significant **variation in teaching experience and technological familiarity** calls for differentiated learning pathways within the program. While experienced teachers may benefit from advanced pedagogical strategies and leadership roles, less experienced or novice users require more guided, scaffolded support to build confidence in using robots effectively.

B. Modular Design

The varying levels of robot experience and a wide range of subject areas imply the need for **modular training design** that can cater to beginners through to expert users, allowing for self-paced progression and opportunities for peer mentoring and community building. The key implications are:

- The **modular design** and differentiated content aim to meet the specific needs of each subgroup, fostering confidence and competence in the use of humanoid robots in education.
- The predominance of primary and secondary educators highlights the importance of **modular training materials** that consider the developmental stages of learners and the educational standards in different countries.

C. Multilingual Design

A critical implication for the implementation phase is the linguistic diversity of the target group, spanning at least four European countries: **Portugal, Poland, Croatia, and Germany**. To maximize accessibility and engagement, all training content, including reading materials, videos, quizzes, and assignments, will be **translated** into the native languages represented in the survey. This translation effort not only ensures inclusivity but also respects the **cultural and contextual nuances of each educational environment**, thereby facilitating **adoption** and **impact**.

In summary, the teacher training program must embody flexibility, inclusivity, and cultural sensitivity, supported by multilingual resources and differentiated instructional design. By aligning the training with the diverse characteristics and needs of its participants, the program is positioned to empower educators across Europe to effectively integrate humanoid robots into their teaching practices, ultimately enriching student learning experiences.

4. Purpose of Training

The **"My Robot, My LearnMate"** teacher training program is designed to support the **professional development** of primary and secondary school teachers across Europe by introducing them to the educational use of humanoid robots, specifically the NAO robot.

4.1 General Training Objectives

The training program offers a unique blend of different didactical methods which provide teachers with ample opportunities for **knowledge building, co-creation, collaboration, and knowledge exchange** among educators from different countries and educational contexts.

The training program is designed as a fully online training course which aims to foster **international dialogue and practice sharing**, while equipping teachers with both the **pedagogical and technical competences** necessary to integrate humanoid robots into their teaching practice in meaningful and effective ways.

Beyond **knowledge and skill acquisition** in the area of educational robots, the course aims to foster a **community of practice** among teachers, stimulate **innovation in pedagogy**, and promote the **responsible and creative integration** of emerging technologies in education. The course reflects a broader vision of supporting digital transformation in schools and empowering educators to shape the future of teaching and learning.

The general training objectives are:

- Enhance teachers' **professional development** through innovative educational technologies.
- Foster **co-creational learning experiences** by enabling collaboration across countries and disciplines.
- Build foundational knowledge and practical skills for integrating **humanoid robots**, especially NAO, into classroom teaching.
- Promote awareness of **ethical considerations, data privacy**, and **pedagogical implications** of robotics in education.

- Encourage the application of robotics in diverse subject areas, particularly in **STE(A)M education**.

4.2 Specific Objectives per Module

Beyond the general objectives, the training follows specific objectives per module.

Module 1 – Introduction to Humanoid Robots

- Understand the **role and potential** of humanoid robots in educational settings.
- Identify **benefits, risks**, and **challenges** related to robot-assisted learning.
- Recognize **ethical issues** and **data privacy concerns** when working with educational robots.
- Explore real-world **examples of NAO usage** in schools.
- Reflect on and discuss personal expectations and experiences regarding robotics in education.

Module 2 – Technical Implementation

- Get acquainted with the **NAO robot's hardware and software** functionalities.
- Learn to use the **Choregraphe software** to create basic behaviors and interactions.
- Demonstrate the ability to **program simple sequences and dialogues** for classroom use.
- Troubleshoot common technical issues when working with the NAO robot.
- Understand how to **prepare and maintain the robot** for classroom use.

Module 3 – Teaching Scenarios

- Learn what **teaching scenarios (TS)** are and how to **develop** them for classroom integration.
- Analyze existing teaching scenarios for structure, objectives, and outcomes.
- Develop original, **subject-specific scenarios** that integrate NAO robots (e.g. in computer science, mathematics, or languages).
- Investigate **best practices and case studies** related to robotics-based teaching.
- Adapt teaching scenarios to the **unique educational contexts** and needs of participants' own schools.

The training supports teachers in achieving the following learning outcomes:

- Understand and critically reflect on the **benefits, risks, and ethical issues** related to using humanoid robots in the classroom.
- Identify and evaluate **various possibilities** for using robots in different educational settings.
- Demonstrate **technical proficiency** in using the Choregraphe software to create basic robot behaviors and applications.

- Design and implement **teaching scenarios** that integrate the NAO robot to support subject-specific learning goals.
- Apply and adapt robotic activities and **best practices** to their own classroom and school context, particularly in **STE(A)M education**.

5. Training Modules

The training program developed for the *MyRobot MyLearnmate* project is organized into three modular units that progressively guide educators through the pedagogical, technical, and ethical aspects of integrating humanoid robots, particularly the NAO robot, into classroom environments. The three modules blend theoretical insights with practical examples and multimedia resources to ensure accessibility and relevance for educators across contexts.

5.1 Module 1 - General Introduction to Humanoid Robots

Educational Objectives:

The first module provides educators with a **foundational understanding** of the educational potential, challenges, and current trends related to humanoid robots. The goal is to introduce the concept of robots in education, outline the scope of their application, and engage participants in critical reflection through a curated set of resources and a quiz.

Learning Outcomes:

By the end of the module, participants will understand the benefits, risks, challenges, data privacy, and ethical problems related to the use of robots in education, as well as identify and explain different possibilities of using robots in educational settings.

Specifically, the participants will be able to:

- Define what a humanoid robot is and explain its role in education.
- Identify key opportunities and limitations of integrating robots into classrooms.
- Reflect on ethical considerations and implementation challenges.
- Recognize the diversity of educational settings where robots can be beneficial.

Total Duration: 7 hrs 0 mins

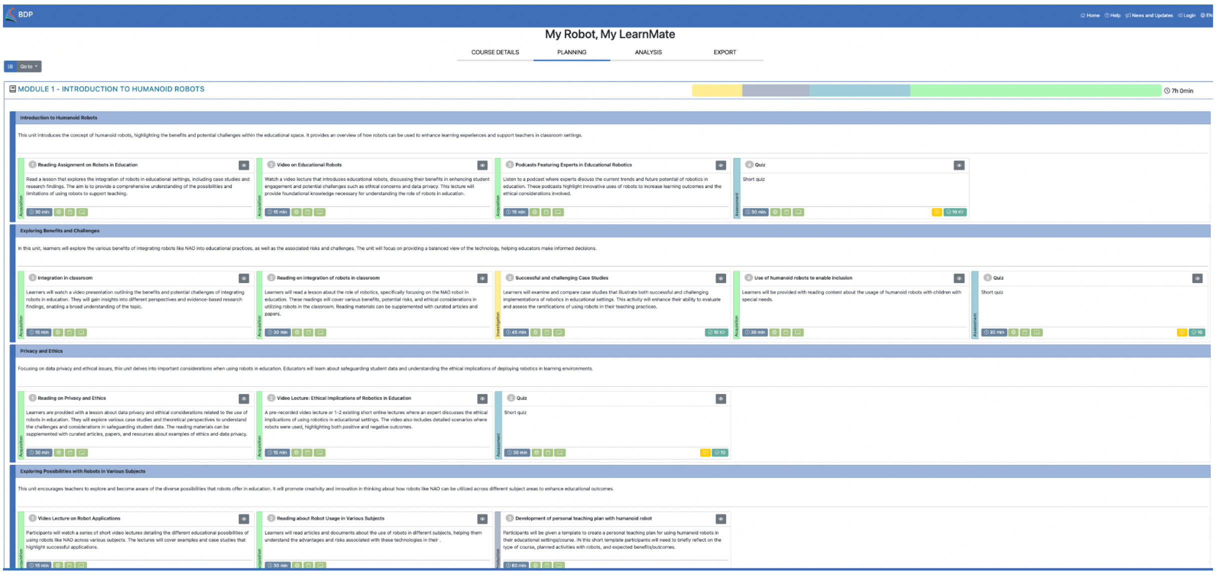

Figure 1: Structure of Module 1 divided into parts and activities: https://learning-design.eu/en/preview/4a8af5c4d15d5a56864cf528/topic/7190

Module 1 is structured as follows:

Unit 1: Understanding the Role of Robots in Education

This unit introduces the concept of humanoid robots and highlights their potential to enrich learning experiences and support educators. Participants will examine how robots can enhance classroom engagement and address specific educational needs.

Learning Activities

- **Reading Assignment: Robots in Education** (30 min): Participants read an introductory lesson exploring how robots are being integrated into education, supported by case studies and research findings.
- **Video Lecture: Educational Robots** (15 min): A concise lecture that explains the use of robots in learning environments, focusing on both benefits (e.g. engagement, differentiation) and challenges (e.g. ethics, technical limitations).
- **Podcast Series: Expert Voices** (15 min): A selection of podcast episodes featuring discussions with experts on current trends and future perspectives in educational robotics.

Assessment

- **Quiz: Basics of Educational Robotics** (30 min | 10 points): A short quiz testing key concepts from the reading, video, and podcast materials.

Unit 2: Exploring Benefits and Challenges

This unit takes a critical look at both the potential advantages and challenges associated with the use of humanoid robots in education. The goal is to help educators evaluate whether, how, and when to use such technologies in a pedagogically meaningful way.

Learning Activities

- **Video: Integration in the Classroom** (15 min): A video overview discussing the practical aspects of robot integration, supported by real-world insights and research evidence.
- **Reading: NAO in the Classroom** (30 min): A comprehensive reading covering opportunities and limitations of using the NAO robot, including ethical concerns.
- **Case Study Exploration** (45 min): Learners explore and compare both successful and problematic case studies involving educational robots, with a focus on reflection and evaluation.
- **Reading: Humanoid Robots for Inclusion** (30 min): A text focusing on the use of robots for inclusive education, especially for children with special educational needs.

Assessment

- **Quiz: Benefits and Challenges of Robotics in Education** (30 min | 10 points)

Unit 3: Privacy and Ethics

This unit addresses important considerations regarding data privacy and ethical implications of using robots in education. It aims to promote critical awareness and responsible use of technology in the classroom.

Learning Activities

- **Reading: Privacy and Ethics in Robotics** (30 min): A detailed reading on data handling, privacy laws, and ethical dilemmas associated with robotics in education, complemented by real-life case examples.
- **Video Lecture: Ethical Implications** (15 min): A recorded expert lecture discussing ethical frameworks and decision-making scenarios involving robots in schools.

Assessment

- **Quiz: Data Privacy and Ethics** (30 min | 10 points)

Unit 4: Exploring Possibilities Across Subjects

In this creative unit, teachers are encouraged to discover how robots like NAO can support learning across various subjects. This unit emphasizes interdisciplinary thinking and personal application.

Learning Activities

- **Video Lecture: Applications in Different Subjects** (15 min): A series of short clips demonstrating how NAO has been successfully used in a range of subjects (e.g., language learning, STEM, social-emotional learning).
- **Reading: Subject-Specific Applications** (30 min): Articles and examples showing innovative ways robots can enhance subject-specific instruction.
- **Production Task: Design a Teaching Plan** (60 min): Participants use a provided template to draft a personal teaching plan that integrates a humanoid robot into one of their courses. The plan should outline the course context, intended activities, and anticipated outcomes.

5.2 Module 2 - Technical Implementation

This module introduces participants to the humanoid robot NAO and its programming environment, Choregraphe. The goal is to build foundational technical skills needed to operate NAO in educational settings, starting from basic setup and progressing to hands-on programming and interaction design.

Educational Objectives:

The second module of the training course *"My Robot, My LearnMate"* focuses on developing the participants' **technical competencies** in using the **Choregraphe software** to create, modify, and deploy basic applications for the NAO robot. By the end of this module, participants will be able to demonstrate essential skills in connecting the robot, building simple apps, and troubleshooting common issues.

Learning Outcomes:

By the end of this module, participants will be able to demonstrate the ability to use Choregraphe software to create and apply basic modules/apps and adapt and apply activities and best practices for integrating robots into the school's unique educational context, especially within STE(A)M education.

Specifically the participants will be able to:

- Set up and connect NAO with Choregraphe.
- Run and modify ready-made apps to create interactive robot behaviors.
- Understand basic interaction patterns using speech and sensor inputs.
- Troubleshoot common issues related to robot operation and programming.
- Begin creating custom logic and extending robot functionality through Python.

Total Duration: 10 hrs 21 mins

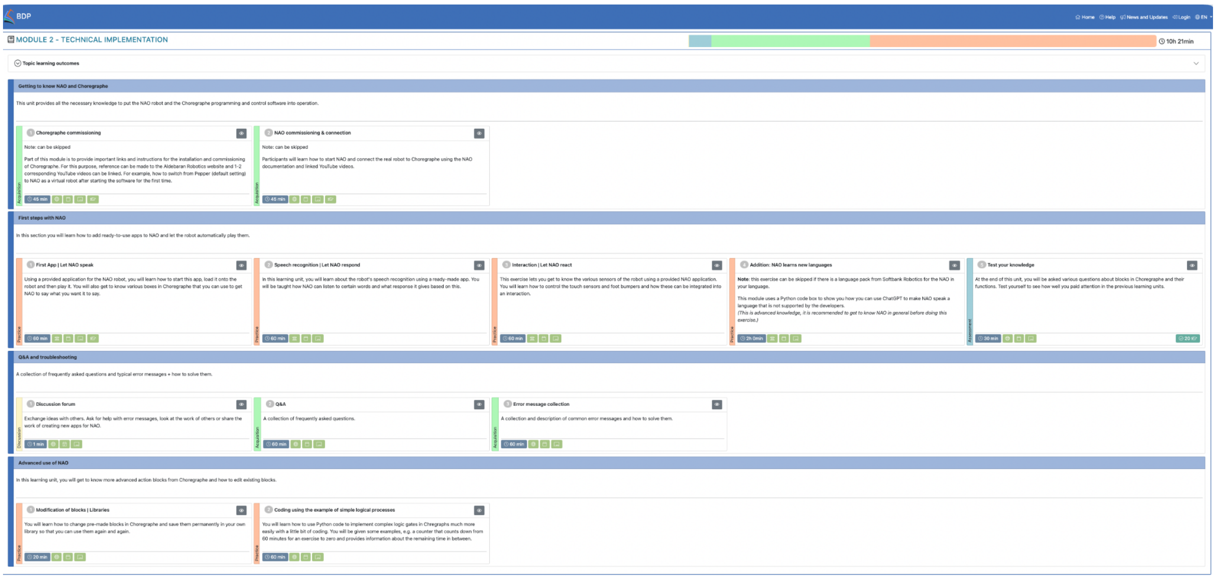

Figure 2: Structure of Module 2 divided into parts and activities: https://learning-design.eu/en/preview/4a8af5c4d15d5a56864cf528/topic/7191

Module 2 is structured as follows:

Unit 1: Setting Up NAO and Choregraphe

This unit provides step-by-step guidance for installing the Choregraphe software and commissioning the NAO robot. While these steps can be skipped in instructor-led environments, self-paced learners will find curated video tutorials and documentation to support the process.

- **Acquisition 1: Choregraphe Setup** (45min): Learners are guided through the installation of Choregraphe, switching from Pepper (default) to NAO as the virtual robot.
- **Acquisition 2: Connecting NAO** (45min): Using official documentation and videos, learners are shown how to start NAO and establish a connection with Choregraphe.

Unit 2: First Steps with NAO

This hands-on unit provides an introduction to core functions of the NAO robot, enabling learners to interact with it through ready-made applications. Participants will gain experience with voice output, speech recognition, and basic sensor-based interaction.

- **Practice 1: First App – Let NAO Speak** (60min): Learners install and run an app that allows NAO to speak predefined text using Choregraphe blocks.
- **Practice 2: Speech Recognition – Let NAO Respond** (60min): This unit introduces the basics of voice input. Participants use a ready-made app where NAO responds to specific keywords.
- **Practice 3: Interaction – Let NAO React** (60min): Learners explore how NAO's sensors (e.g. touch, foot bumpers) can be used to create interactive behaviors.
- **Practice 4 (Optional): NAO Learns New Languages** (120min): An advanced activity showing how to use Python and ChatGPT to enable NAO to speak additional languages. Best suited for learners who already feel confident with NAO basics.
- **Assessment 1: Test Your Knowledge** (30min): A multiple-choice quiz that checks understanding of Choregraphe blocks and interaction logic.

Unit 3: Q&A and Troubleshooting

This unit serves as a support hub for resolving technical issues and sharing insights. Learners can consult FAQs, identify solutions to common errors, and engage in peer exchange.

- **Discussion 1: Forum Participation** (flexible duration): Learners are encouraged to ask questions, share experiences, and support peers.
- **Acquisition 1: Frequently Asked Questions (FAQ)** (60min): Curated Q&A list based on common setup and usage problems.
- **Acquisition 2: Error Message Collection** (60min): Troubleshooting resource explaining common error messages and how to solve them.

Unit 4: Advanced Use of NAO

This final unit introduces more complex programming techniques with Choregraphe, including block modification and basic Python coding. It is designed for learners who want to customize NAO’s behavior and extend its functionalities.

- **Practice 1: Modifying Blocks and Using Libraries** (20min): Participants learn how to edit and save custom Choregraphe blocks for future reuse.
- **Practice 2: Coding Logic in Python** (60min): Learners are introduced to integrating simple logical structures via Python code—for example, creating timers or counters that support classroom activities.

5.3 Module 3 - Teaching Scenarios with Humanoid Robots

This module empowers elementary school teachers to design, apply, and continuously refine **teaching scenarios** that integrate **sustainability** and **environmental education**. Participants will work collaboratively on an open online platform, developing **modular, adaptable scenarios** that meet the needs of diverse learners and classroom environments.

Educational Objectives:

Emphasis is placed on **practical strategies, creative collaboration**, and **peer feedback**, enabling teachers to confidently implement digital and interactive teaching scenarios, despite ICT or language challenges.

Learning Outcomes:

By the end of this module, participants will be able to:

- Create teaching scenarios that integrate NAO robots for various subjects such as computer science, mathematics, and languages.
- Apply developed teaching scenarios in classroom settings to support learning outcomes.

Total Duration: 12h 00min

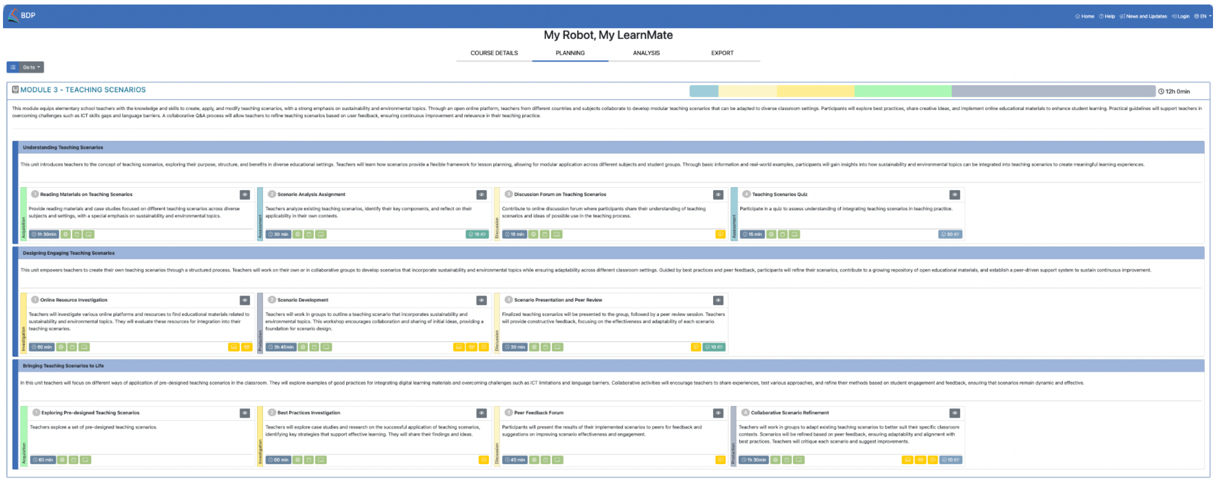

Figure 3: Structure of Module 3 divided into parts and activities: https://learning-design.eu/en/preview/4a8af5c4d15d5a56864cf528/topic/7192

Module 3 is structured as follows:

Unit 1: Understanding Teaching Scenarios

This unit introduces the foundational concept of teaching scenarios. Teachers will explore their **structure, purpose, and benefits**, focusing on how modular design enables adaptation across subjects and student age groups. A key emphasis lies on integrating sustainability themes to create **relevant and meaningful learning experiences**.

- **Acquisition, 1. Reading Materials on Teaching Scenarios** (1h 30min): Participants explore reading materials and case studies showcasing teaching scenarios in various subjects and settings, with emphasis on sustainability and environmental education.
- **Assessment, 2. Scenario Analysis Assignment** (30min): Teachers analyze and reflect on existing scenarios, evaluating their components and suitability for their own teaching contexts.
- **Discussion, 3. Discussion Forum on Teaching Scenarios** (15min): Exchange initial reflections and ideas on possible classroom applications of teaching scenarios.
- **Assessment, 4. Teaching Scenarios Quiz** (15min): A short quiz assessing understanding of the purpose, structure, and benefits of teaching scenarios.

Unit 2: Designing Engaging Teaching Scenarios

In this unit, teachers begin to **create their own scenarios**, drawing from best practices and collaborating with peers. The scenarios are expected to reflect **sustainability themes** while offering adaptability across different subjects and classroom settings. Teachers will contribute to a shared repository of open educational materials and receive **constructive feedback** throughout the design process.

- **Investigation, 1. Online Resource Investigation** (60min): Identify and evaluate educational materials and platforms relevant to sustainability and environment-related teaching.
- **Production, 2. Scenario Development** (3h 45min): Collaborative workshop where teachers sketch out their own teaching scenarios in groups. Focus on creativity, adaptability, and modular structure.
- **Discussion, 3. Scenario Presentation and Peer Review** (30min): Teachers present their developed scenarios for peer review, receiving feedback on clarity, engagement, and potential for adaptation.

Unit 3: Bringing Teaching Scenarios to Life

This final unit focuses on the **implementation** and **refinement** of teaching scenarios in real classroom contexts. Teachers will analyze **best practices**, share experiences from their own implementation, and collaboratively adapt scenarios for broader usability. Special attention is paid to overcoming challenges like **ICT limitations** and **language diversity**.

- **Acquisition, 1. Exploring Pre-designed Teaching Scenarios** (60min): Explore a curated collection of sample scenarios and evaluate their potential in your own context.

- **Investigation, 2. Best Practices Investigation** (60min): Examine case studies and educational research to identify success factors in scenario-based learning. Share takeaways with peers.
- **Discussion, 3. Peer Feedback Forum** (45min): Share implementation experiences and gather suggestions for improving the engagement and impact of your scenario.
- **Production, 4. Collaborative Scenario Refinement** (1h 30min): Group work to refine and adapt scenarios based on peer input and classroom feedback. Focus on aligning with best practices and increasing flexibility.

6. Mode of Delivery

6.1 Structure and Delivery

The training program is designed as an **online course / e-course** and delivered as a **self-paced online training program** with the aim to support **flexible and autonomous** learning for **busy educators**. This approach allows participants to engage with the content and complete assignments at their **own pace**, making the course suitable for teachers with varying schedules and availability

The training program structured into three comprehensive modules each following a different yet connected set of goals:

- **Module 1 – Introduction to Humanoid Robots:** Focuses on familiarizing teachers with the role of humanoid robots in education, including their benefits, risks, and ethical considerations.
- **Module 2 – Technical Implementation:** Provides hands-on experience with the Choregraphe software, enabling participants to create simple programs and understand basic robot functionalities.
- **Module 3 – Teaching Scenarios:** Guides participants in designing, analyzing, and applying teaching scenarios using NAO robots across different subjects such as computer science, mathematics, and languages.

The course delivery model aligns with the core goals of the training: to provide a flexible, inclusive, and high-quality professional learning experience that equips teachers with the knowledge and skills to integrate humanoid robots into their educational practice.

6.2 Learning Environment

The course is available on the **open Moodle LMS platform** hosted by UNIZG FOI, a widely recognized and widely used learning management system in the education sector. Moodle offers a familiar and user-friendly interface for most teachers, facilitating smooth navigation, intuitive access to learning resources, and structured progress tracking. The platform supports interactive elements such as quizzes, downloadable materials, multimedia content, and self-assessment tools, enhancing the learning experience.

The course can be accessed at the following link: https://learn.foi.hr/mod/page/view.php?id=5998

To ensure accessibility and inclusion, the training program will be hosted on the open platform available to all interested participants. Moreover, the content will be available in **five languages: English, Croatian, German, Portuguese, and Polish**. This multilingual approach supports wide participation and accommodates the diversity of educational systems across Europe.

6.3 Workload and Certification

All course activities have been thoughtfully designed to be **executed independently**, without the need for synchronous sessions or live facilitation. This mode of delivery empowers learners to take ownership of their professional development, progress through the material at their own speed, and revisit content as needed for deeper understanding or reinforcement.

The **expected workload** for the course is approximately **30 hours**, which corresponds to **1 ECTS credit**. This estimation provides guidance for time management and reflects the comprehensive scope of the course, which spans technical, pedagogical, and ethical dimensions of using humanoid robots in education.

Participants who complete all mandatory activities and obtain **at least 80% of points** through module quizzes are awarded a **Certificate of Completion**. This certificate, available in **.pdf format**, can be downloaded from the course platform once all requirements have been met. It serves as formal recognition of the teacher's engagement and newly acquired competences in educational robotics.

7. Resources Needed

"My Robot, My LearnMate" training program will require participants to have access to the following **resources** to successfully participate:

1. Technical Resources

These are essential for the **hands-on programming and robot interaction** activities, especially in Module 2.

- **A computer or laptop** with:
  - Internet access.
  - Sufficient processing power to run **Choregraphe software**.
  - Administrative rights to install software (Choregraphe).
- **Choregraphe software** (official programming environment for NAO).
  - Installation files and setup guides (provided in the course).
- (Optional but beneficial) **Access to a NAO robot**:
  - To practice physical interaction and testing.
  - Alternatively, use of a **virtual NAO simulation** within Choregraphe.

2. Digital Learning Tools

For engaging with the **online self-paced course** content hosted on Moodle:

- Access to the **Moodle LMS platform**:
  - A stable internet connection.
  - Device compatibility with videos, quizzes, and interactive content.
- **Headphones and microphone**:
  - For engaging with podcast content and possible voice programming tasks.
- **Basic file handling skills**:
  - To manage downloads, uploads, and use of templates (e.g., for teaching plan production).

3. Time and Organizational Resources

- Around **30 hours of dedicated time** over the course duration.
- A **quiet workspace** conducive to focused learning and experimenting with robot programming.

8. Expected Outcomes

Upon successful completion of the training program, participating elementary school teachers will be equipped with a solid foundation to integrate humanoid robots and digital tools meaningfully into their classroom practice. Drawing from interdisciplinary modules grounded in design thinking, pedagogy, and real-world application, teachers will demonstrate competencies in the following areas:

8.1 Pedagogical Integration of Educational Robots

- Teachers will understand the **educational potential of humanoid robots** (e.g., NAO) and be able to explain their role in enhancing student engagement and learning across subjects.
- They will be able to **integrate robots effectively into lesson plans**, leveraging them as facilitators, learning companions, or support tools within active learning strategies such as storytelling, games, and project-based learning.

8.2 Competency-Based Scenario Design

- Teachers will be able to **design, adapt, and apply teaching scenarios** that align with curriculum objectives and focus on **sustainability and environmental topics**.
- They will create **modular, flexible scenarios** suitable for diverse classroom settings and student needs, using real-world examples and digital resources.

8.3 Collaboration and Use of Digital Resources

- Teachers will confidently **navigate and contribute to open online platforms**, engaging in cross-cultural collaboration with peers from other countries and disciplines.
- They will be able to **locate, assess, and integrate digital educational resources** (e.g., videos, quizzes, lesson templates) into their own teaching scenarios, with special emphasis on sustainability.

8.4 Reflection, Feedback, and Continuous Improvement

- Teachers will demonstrate the ability to **evaluate existing scenarios**, provide and incorporate **peer feedback**, and iteratively refine their work based on practical implementation and shared experiences.
- They will participate in reflective practices such as empathy mapping, discussion forums, and scenario critique, strengthening their ability to **adjust content based on learner needs and classroom realities**.

8.5 Overcoming Implementation Challenges

- Teachers will develop **strategies to address ICT skill gaps, language barriers**, and infrastructure limitations in implementing digital or robot-enhanced scenarios.
- They will be equipped with **practical guidelines and peer-supported strategies** to ensure successful adoption of the developed materials in real-life teaching contexts.
- The program fosters teachers' **key competencies** to overcome challenges such as **critical thinking, problem solving, communication, and environmental responsibility**.

9. Appendices

Useful links

References