

# Prompt Engineering Skills (PES) Pedagogical Framework

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By Complexul Cultural Sportiv Studentesc Tei, SÜRDÜRÜLEBİLİR  
DİJİTAL DÖNÜŞÜM DERNEĞİ, PRAMMER Institute, Advanced  
Digital Institute, and CBKA Research Center Ltd



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## PARTNERS:



SÜRDÜRÜLEBİLİR  
DİJİTAL DÖNÜŞÜM  
DERNEĞİ

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# Introduction

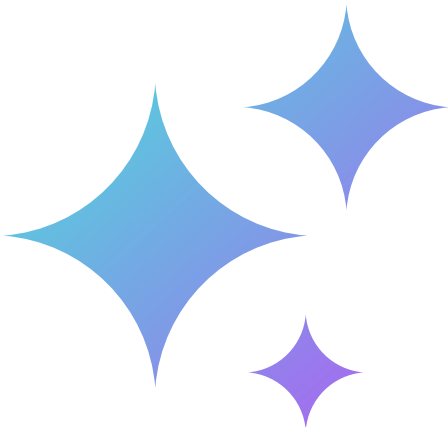
## General Information

The rapid transformations driven by artificial intelligence (AI) require an equally dynamic educational response. In this context, the development of a Prompt Engineering Skills (PES) that integrates AI competencies and provides a flexible training framework becomes a vital priority for modern education systems.

AI is already shaping the way we learn, work, and interact socially. However, AI literacy remains low, especially among young people entering the labor market. Many lack a basic understanding of how AI works, how to use it critically and ethically, and how it may impact their personal and professional future.

### In this context, the Prompt Engineering Skills (PES) framework aims to:

- Support the formation of a **general culture of AI understanding** among students, trainees, and lifelong learners, especially youth entities and disadvantaged young people;
- **Integrate digital and critical thinking skills** into the educational process across disciplines and into the workplace;
- Promote a **flexible, modular, and adaptable framework** capable of responding to diverse learner needs;
- Ensure educational inclusion, so that all social groups, including youth from disadvantaged backgrounds, have equal access to quality training.



## Purpose of the Guideline

This guideline provides a methodological framework for educational institutions, trainers, policymakers, and curriculum developers, with the aim to:

1. **Introduce foundational AI concepts** into the learning process in an accessible and practical way;
2. **Propose flexible pedagogical principles**, adaptable to various educational contexts (formal, non-formal, vocational);
3. Support the development of transversal skills: critical thinking, digital ethics, collaboration, creativity, and adaptability;
4. **Promote an inclusive approach**, sensitive to cultural, social, and learning differences;
5. **Align educational strategies with labor market realities**, emphasizing future-ready skills.

## Structure of the Guideline

- Part 1 - Overview of PES and their importance for youth development, employability and inclusion (ADI+ASDIT)
- Part 2 - Strategies for embedding PES into NFL and PBL methods, including lesson plans and activities (CCSS TEI)
- Part 3 - Guidance on using media tools (humor, visuals, storytelling) to make learning more engaging (PRAMMER)
- Part 4 - Tips on customizing for framework for different youth groups, ensuring inclusivity and relevance (CBKA)

By adopting this Prompt Engineering Skills framework, educators can transform the classroom into a preparation space for an AI-augmented society, where every young person is empowered to understand, use, and create technology responsibly.

## Core Pedagogical Principles of the Prompt Engineering Skills(PES) Framework

To effectively prepare learners for an AI-integrated society, the Prompt Engineering Skills (PES) framework is grounded in five key pedagogical principles. These principles support a holistic, inclusive, and future-oriented educational approach designed to develop both technical and human-centric competencies.

No	Principle	Purpose	AI Literacy Application
1	Learner-Centered Design	Empower active engagement and autonomy	Critical thinking about AI's role in society
2	Modular & Flexible Structure	Enable adaptation to diverse contexts and needs	Custom AI content for various levels and sectors
3	Interdisciplinary Learning	Foster real-world, cross-domain thinking	Projects on AI and climate, ethics, media, etc.
4	Inclusion & Accessibility	Ensure equity and opportunity for all learners	Accessible AI education for underrepresented groups
5	Ethical Use of AI	Promote responsible, human-centered technology use	Bias awareness, data ethics, digital citizenship

## Implementation Toolkit

This section offers practical tools, resources, and examples to support educators, trainers, and institutions in implementing the Prompt Engineering Skills framework. The toolkit is designed for adaptability, allowing for contextualization in both formal and non-formal education environments. A modular curriculum helps integrate AI literacy progressively across education levels and training formats. Below is a sample modular structure:

### Level 1: AI Awareness (Introductory)

- What is AI? (basic concepts and history)
- Everyday AI (recommendation systems, voice assistants)
- Introduction to digital data and algorithms


### Level 2: AI Understanding (Intermediate)

- Machine Learning and Decision Trees (visual simulations)
- Data Bias and Fairness
- AI in the World of Work (career implications)

### Level 3: AI in Practice (Advanced)

- Applying advanced generative AI tools to support creativity, communication, and problem-solving;
- Using AI ethically in research and content creation
- AI project design (mini-hackathons, solution-building)

Each module includes:

- Learning objectives
  - Suggested activities
  - Assessment methods
  - Required digital tools or platforms
- 

## Learning Activity Templates

### Example 1 – Ethical Debate on AI in Hiring

- Objective: Develop critical thinking and ethical reasoning
- Setup: Divide class into groups—HR managers, AI developers, and job seekers
- Task: Debate whether an AI should make hiring decisions
- Tools: Slides, role cards, reflection worksheet

### Example 2 – Create Your Own Recommender System (No Code)

- Objective: Understand how algorithms use data
- Tools: Google Sheets or Scratch
- Task: Students input preferences and simulate movie/music recommendations

### Example 3 – Applied AI Communication Challenge

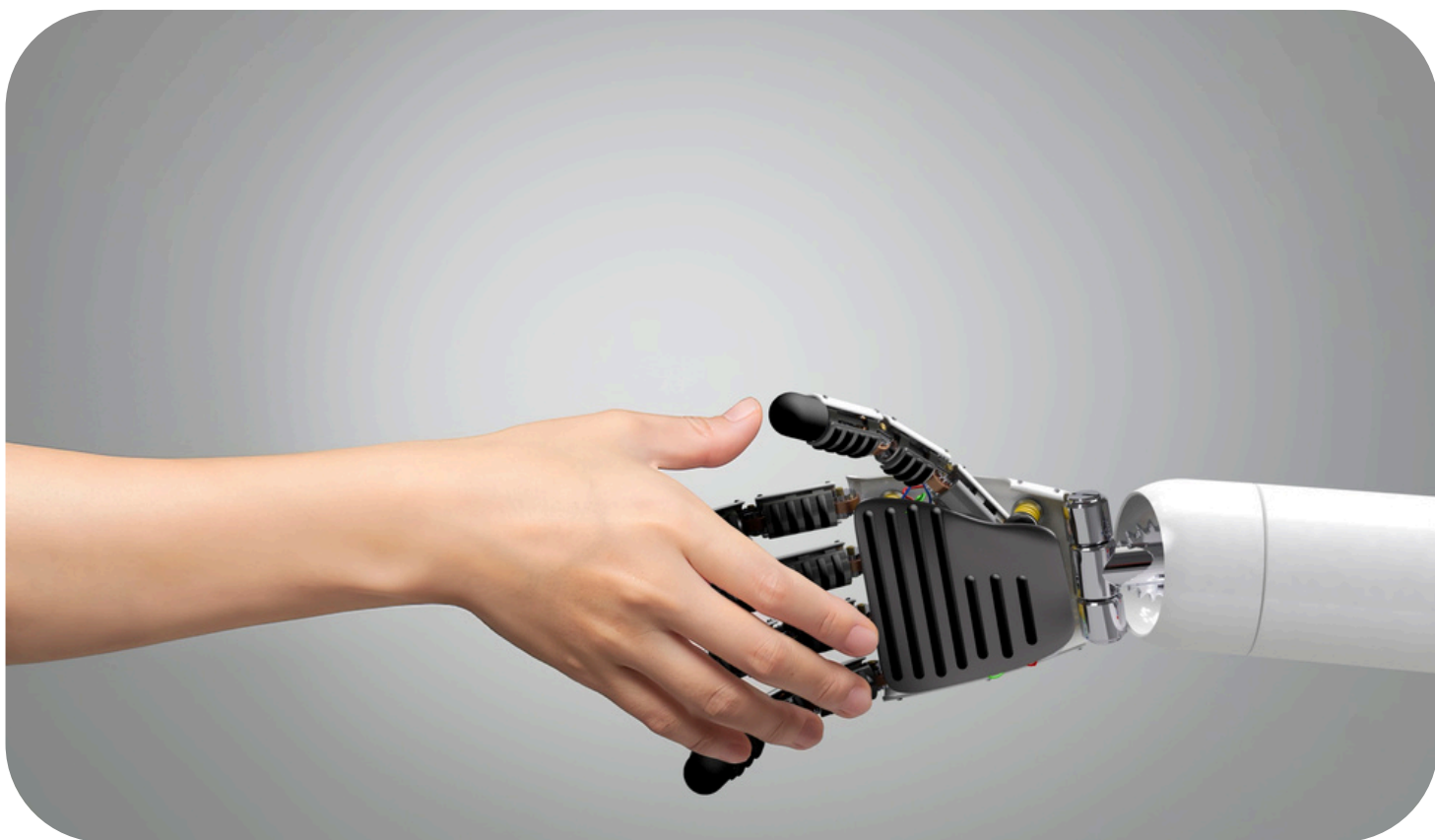
- Objective: Develop the ability to communicate effectively and ethically with AI systems in order to generate meaningful, inclusive, and context-aware content.
- Task: Use accessible tools such as ChatGPT or Canva AI to create content within specific constraints—such as maintaining a respectful tone, ensuring factual accuracy, and addressing a socially relevant topic. This exercise promotes both creativity and responsibility, particularly for NEET youth and persons with disabilities who may face barriers to digital participation.

## Monitoring and Impact

A robust monitoring and evaluation (M&E) strategy is essential to ensure that the Prompt Engineering Skills (PES) framework not only delivers content but also empowers learners with practical skills, ethical understanding, and long-term employability. This section outlines how to assess impact, ensure continuous improvement, and align AI literacy efforts with learner needs and system-wide goals.

### **In the context of AI literacy, monitoring helps answer key questions:**

- Are learners developing a critical understanding of AI?
- Is the content inclusive, accessible, and relevant across learner groups?
- Are educators equipped to deliver AI modules effectively?
- Are AI-related competencies influencing employability outcomes?



## **Suggested Indicators**

Below are SMART indicators (Specific, Measurable, Achievable, Relevant, Time-bound) for Prompt Engineering Skills implementation:

### **Quantitative Indicators**

- a twenty-minute video tutorial for youth entities and one twenty-minutes video tutorial for disadvantaged young people.
- 100 views for the youth entities video tutorial
- 200 views for the disadvantaged youth tutorial
- 1 testing held for the video tutorials and Prompt Engineering Skills pedagogical strategy
- 25 young people attending the testing/training (5 per partner)  
- 25 youth workers attending the testing/training (5 per partner)
- 50 survey responses from participants providing feedback on the tutorials (10 per partner)
- 1 Prompt Engineering Skills pedagogical strategy with 4 key parts developed, distributed, and accessed
- Prompt Engineering Skills distributed to 100 youth entities
- Prompt Engineering Skills accessed by 100 viewers
- 60 youth workers, youth entities, and organizations implementing the Prompt Engineering Skills pedagogical framework during the first phase of the project

### **Qualitative Indicators**

- Feedback from youth entities, youth workers, and disadvantaged young people on the clarity, relevance, and accessibility of the two 20-minute video tutorials through internal test training.
- Peer reviews and expert evaluations of the video tutorials, assessing their pedagogical soundness and effectiveness in enhancing AI literacy.
- Evaluation of the Prompt Engineering Skills (PES) pedagogical framework by youth sector experts and educational specialists, focusing on adaptability, creativity, and usability.
- Feedback from youth workers, youth entities, and participants on the practicality and adaptability of the Prompt Engineering Skills (PES) pedagogical framework.
- Feedback from participants on the effectiveness of the transnational project meetings (both face-to-face and virtual) in improving coordination, cooperation, and workflow organization.

# Part 1. **Overview of PES and their importance for youth development, employability and inclusion**

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Prompt Engineering Skills (PES) refers to a structured and flexible approach to education that empowers learners with the skills, knowledge, and mindset required to thrive in a rapidly evolving, AI-integrated world. At its core, Prompt Engineering Skills prioritizes relevance, accessibility, and adaptability, making it a critical tool for youth development and social inclusion.

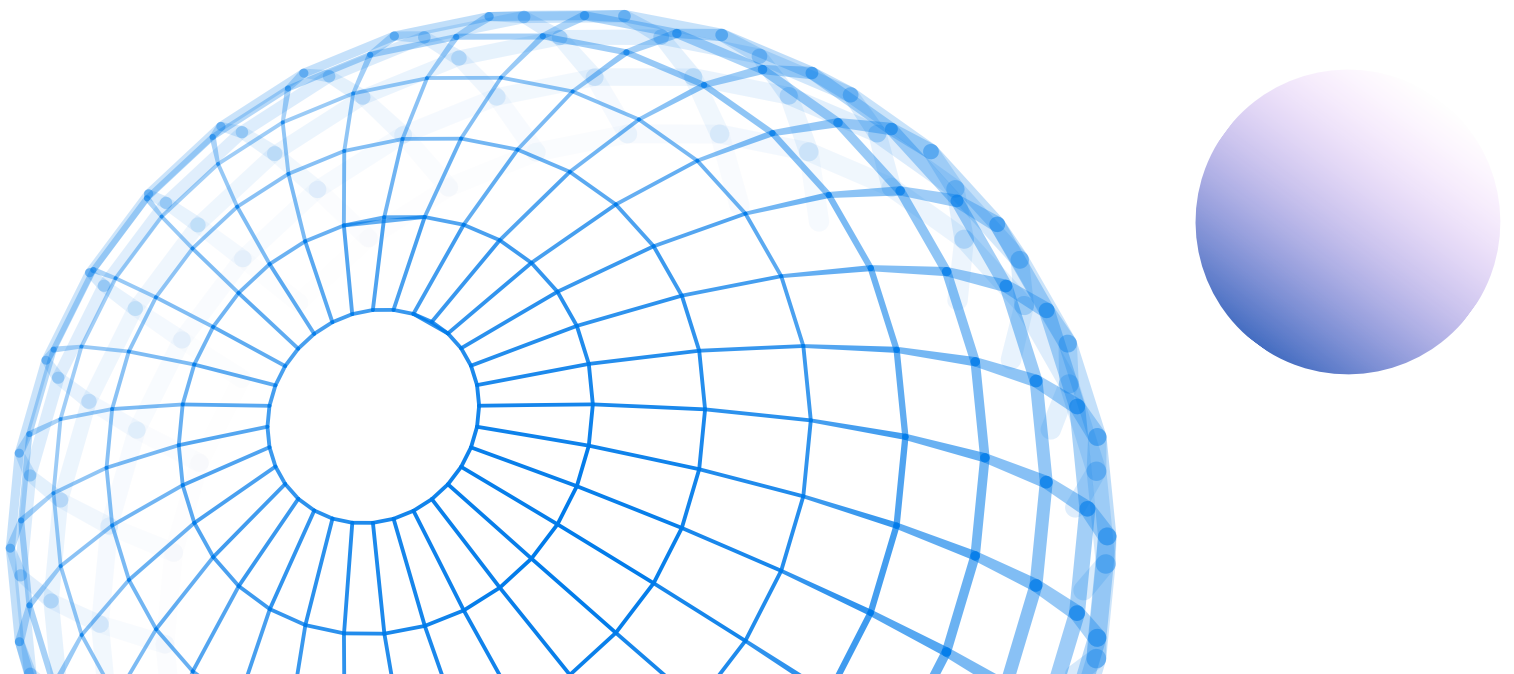
# 1. Introduction

## 1.1 Context of Rapid Technological Change

Artificial intelligence (AI) has become one of the most important forces in industry, society and across education. According to the data released by the World Economic Forum (2023), it is expected that over 75% will be adopting AI technologies by 2030. Naturally, this tendency will reshape the jobs, communication channels and even required skills. AI as a game changer with its tools like natural language processing assistants, recommendations systems alters how youngsters are acquiring the knowledge. (UNESCO, 2019).

Meanwhile, by creating some opportunities, these tools also exacerbate inequalities. To illustrate, youth classified as NEET and coming from disadvantaged background( migrant backgrounds, disabled, rural areas habitant etc.) are subjected to exclusion risks by these transformations. (OECD, 2024). Without targeted interventions, such groups risk being left behind in the emerging **AI-driven economy**, reinforcing cycles of unemployment and social marginalization.

Prompt Engineering Skills (PES), on the other hand, is an innovative pedagogical reaction to these challenges. PES aims to provide youth AI literacy, critical thinking and ethical reasoning. Unlike traditional approaches, PES focuses on how humans communicate within AI systems, and how we can enable learners to make profit of AI as a creative tool, responsible innovation and problem-solving. (Selhorst & Perez, 2024).




## 1.2 The Need for PES (Prompt Engineering Skills)

Prompt Engineering is the cornerstone of AI due to the growing reliance on AI systems. PES is in a sense, the art of structuring effective interactions with AI models. This puts it in a critical position in terms of employability. Moreover, employers prefer more and more employees who are compatible to use AI systems efficiently, critically and ethically. (Grand View Research, 2025).

### To illustrate some fields of AI applications:

- In healthcare, AI is used for diagnostics, requiring professionals to **interpret outputs responsibly**.
- In media and communication, AI is applied in content generation, demanding **skills in evaluating bias and ensuring inclusivity** (Buckingham, 2003).
- In education, AI chatbots and tutoring systems rely on **well-designed prompts** to deliver accurate and personalized learning experiences.

This need of preparing youth via the education while using AI tools to be critically questioning them, perceiving accountability, transparency and bias was also emphasized by the **European Commission's Ethics Guidelines for Trustworthy AI (2019)**. Hence, PES is more than a digital skills but a competency, a bridge so to speak, with incorporating ethical, civic, and social responsibility.



## 1.3 Scope and Purpose of This Document

This section aims to:

1. Define the PES framework and situate it within broader educational priorities.
2. Highlight its role in addressing **youth development challenges**, including skills gaps, unemployment, and exclusion.
3. Demonstrate its alignment with **labor market trends** and employability requirements.
4. Provide practical and policy-oriented recommendations for embedding PES into education and training systems.

By doing so, it positions PES as both a pedagogical innovation and a social inclusion strategy.

## 2. Defining the PES Framework

### 2.1 What is a Prompt Engineering Skills (Prompt Engineering Skills)?

Prompt Engineering Skills (PES) refers to a structured, competency-based framework that enables learners to design, refine, and evaluate human-AI interactions. PES integrates:

- AI literacy (basic knowledge of AI systems, algorithms, and applications).
- Critical thinking and ethics (ability to evaluate outputs for fairness, inclusivity, and reliability).
- Applied creativity (using AI for problem-solving, innovation, and knowledge creation).

In reality PES is the art of preparing learners for asking right questions in correct way. Meaning that, instead of asking "Write an article about climate change" to AI tool, a PES-trained learner would be aware of the importance of specification, contextualization, and ethical awareness and would ask the following: " Write a 1000 word article on the topic of climate change that includes 3 examples from Türkiye with an accessible language for young people. Highlight both solutions and risks."

## 2.2 Key Characteristics: Flexibility, Inclusivity, AI-Relevance

### Key three defining characteristics of PES:

1. Flexibility: Adaptable to formal education (schools), non-formal learning (youth centers, NGOs), and vocational training. Modules can be scaled and customized to learner needs (Resnick, 2017).
2. Inclusivity: Ensures equal access for disadvantaged youth. Some provided opportunities include, hybrid options, multilingual services, and assistive technologies for learners with disabilities (Colker, 2013).
3. AI-Relevance: It is directly linked with real-world usage of AI, linking classroom learning to labor market demands and civic engagement (OECD, 2024).

## 2.3 Prompt Engineering Skills vs. Traditional Curricula

Dimension	Traditional Curricula	Prompt Engineering Skills (PES)
<b>Knowledge Focus</b>	Static knowledge transfer	Applied AI literacy, ethics, and creativity
<b>Teaching Method</b>	Teacher-centered	Learner-centered, project-based
<b>Inclusivity</b>	Limited adaptation	Designed for marginalized & diverse learners
<b>Labor Market Link</b>	Weak alignment	Strong AI-employability connection
<b>Skills Emphasis</b>	Memory & reproduction	Critical thinking, collaboration, problem-solving

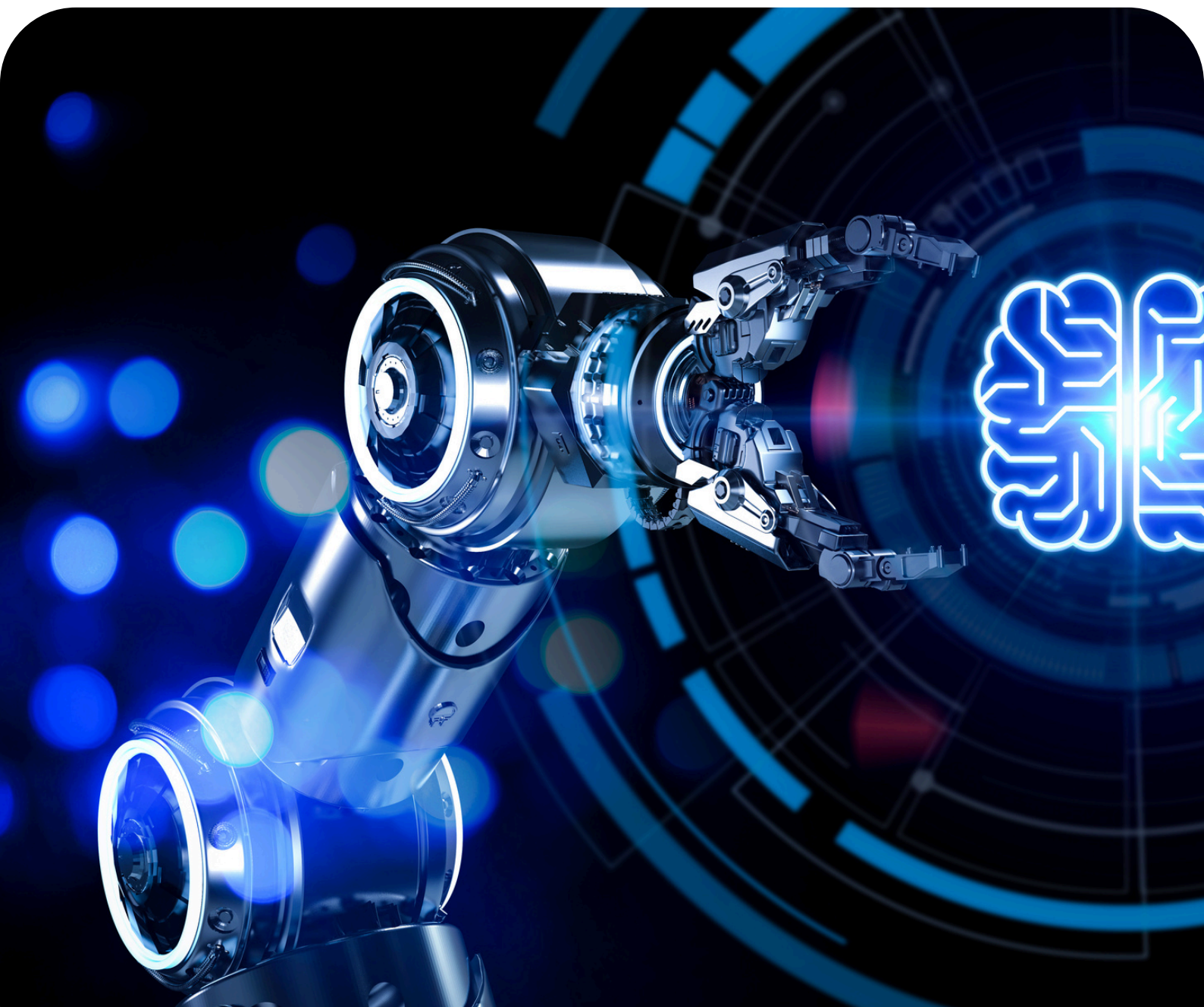
This comparison shows PES as a transformational framework bridging the gap between education and the evolving world of work.

### 3. Youth Development in the Age of AI

#### 3.1 Skills Gap Among Youth

Eurostat data retrieved in 2023 indicates that, around 42% of European youth aged 16-24 possess only basic or below-basic digital skills. This gap is even bigger among migrant, and rural youth, as access to high-quality digital education is limited (UNESCO & UNDP, 2024).

PES comes to the scene as a response to addresses this gap by equipping youth with future-oriented skills, bridging the divide between digital literacy and AI literacy.



### 3.2 Challenges: NEET Status, Early School Leaving, Unemployment

- **NEET** (Not in Education, Employment, or Training) **Youth**: In the EU, over **9 million young people** are classified in this group. They are facing higher risks of long-term unemployment (ETF, 2024).
- **Early School Leavers**: PES bridges among the lack of information with applications.
- **Unemployment**: Youth unemployment remains above 14% in several EU states (OECD, 2024). In that regard, PES increases the chance of employability by integrating technical skills related to emerging labor markets.

### 3.3 Role of Prompt Engineering Skills in Youth Development

PES builds confidence in digital and AI skills.

It encourages collaboration both in formal and non-traditional learning styles. It helps to ensure youth is critically evaluating AI impacts in privacy, human rights and democracy and human rights. (European Commission, 2019).



## 4. PES and Employability

### 4.1 Transitioning from School to Work

One of the greatest challenges for youth is the school-to-work transition. Employers often note a mismatch between graduates' skills and workplace demands. PES helps bridge this gap by integrating project-based experiences such as hackathons, simulations, and AI toolkits into learning environments. These approaches provide learners with practical exposure before entering the labor market (Resnick, 2017).

### 4.2 Embedding 21st Century Skills (AI Literacy, Ethics, Collaboration)

Communication, digital literacy and collaboration are cornerstones of the employability according to the European Key Competences for Lifelong Learning data retrieved in 2018.

Literacy of AI is crucial in terms of understanding bias, applications and algorithms. Ethics is another main element promoting accountability, inclusivity and promoting fairness in AI usage.

Collaboration is the last but not the least element in encouraging teamwork while innovation and problem-solving.

### 4.3 How Prompt Engineering Skills Aligns with Labor Market Trends

According to the Future of Jobs Report (World Economic Forum, 2023) around 97 million new roles will emerge globally by 2030 due to AI's increasing usage. This tremendous change will take place particularly in data analysis, digital transformation and AI development. At the same time, 85 million jobs may be displaced if youth are not retrained (Grand View Research, 2025).

At this point the importance of PES is once again a necessity since it aligns with labor market needs by preparing practitioners for:

- Mixed human-AI collaboration roles;
- AI-driven entrepreneurship opportunities;
- Responsible digital innovation, ensuring sustainable growth.

## 5. Promoting Inclusion through Prompt Engineering Skills

### 5.1 Structural Barriers Faced by Marginalized Youth (gender, geography, disability)

Inclusion remains a significant challenge across European education systems, especially for the youth who are experiencing disadvantages due to geography, gender, disability or socioeconomic factors. A 2024 report by Eurochild summarised insights from civil society in 26 countries, highlighting that children in poverty, Roma communities, migrant families and those with disabilities have unequal access to quality education. These barriers include hidden educational costs, discriminatory placement in special schools when it is not needed and insufficient psychosocial support. These challenges disproportionately affect young people from rural areas or minority backgrounds, especially where language barriers and structural underfunding are also present.

Digital exclusion intensifies these inequalities even more. Despite digitisation during and after the COVID-19 pandemic, many disadvantaged learners suffered even more with online or blended learning models. This included: lack of infrastructure, digital literacy, and pedagogical support in under-resourced communities. Even when devices are available, learners with disabilities often face accessibility issues due to poorly designed platforms and a lack of inclusive teaching practices.

The rise of AI-based educational tools introduces new possibilities, but we also have to look out for its potential risks. A review of AI's role in inclusive education notes that while AI can support personalisation and assistive learning, however its uneven adoption across wealthier and poorer schools may deepen these divides. Equity in access and teacher training remains essential if AI-supported education is to benefit all learners and not just those in privileged settings.



## 5.2 Prompt Engineering Skills in Supporting Youth from Rural, Migrant, and Roma Communities

Prompt Engineering Skills (PES) holds significant promise for supporting marginalised youth as an adaptive and learner-centred approach. Particularly relevant to the Humorize project is how PES can integrate interactive elements like storytelling, humour, and digital accessibility to also reach excluded groups.

One example of this potential is JsStories, an interactive learning tool developed to teach programming to migrants and refugees in Belgium. The platform combines real-life narratives from underrepresented learners with PRIMM-based pedagogical sequencing, allowing students to build computational skills while seeing their own experiences reflected in the content. This contextual learning experience has been shown to increase engagement and reduce dropout among youth from marginalised backgrounds.

Likewise, AI tools can dynamically support inclusion by responding to learners' linguistic and cognitive needs. A comprehensive study from the Technical University of Darmstadt shows that AI-powered real-time translation, personalised tutoring, and adaptive interfaces can help overcome both language and learning barriers in early education. These tools are especially valuable for young learners with special educational needs or those from multilingual households. However, the study stresses the importance of guided implementation, to avoid over-reliance or exclusion of students speaking underrepresented languages.

While PES cannot single-handedly overcome systemic discrimination, it can help create more engaging and respectful learning spaces. AI-integrated storytelling tools, for example, could support Roma youth in expressing cultural identities while acquiring digital skills, an area where both humour and participatory pedagogy can play powerful roles.

### 5.3 Case Snapshot: A Community-Based Prompt Engineering Skills Initiative

A representative case aligning with PES and Humorize principles is drawn from the Inclusive Digital Education Erasmus+ projects examined by the European Agency for Special Needs and Inclusive Education. Among them, the Inclusive Digital Education for Students and Families with Fewer Opportunities project focused on training both learners and their families in basic digital competencies.

The project recognised that digital gaps could not be solved by providing hardware alone; instead, it included training modules co-developed with local communities and educators to promote real agency in using technology.

Similarly, the Blended Learning for Inclusion project offered practical digital toolkits for teachers working with migrant and disadvantaged youth, supporting their professional capacity to deliver inclusive education in hybrid settings.



## 6. Strategic Partnerships for Effective PES

### 6.1 Collaboration with NGOs, Tech Sector, and Employers

Equipping young people with digital competencies cannot be the task of just one single actor. As highlighted by Alison Brittain, today's youth are not automatically "digital natives" in the workforce. While they may be proficient in social media, they sometimes lack clarity and confidence about the digital skills actually needed for jobs. This creates a pressing demand for multi-sectoral collaboration (involving education systems, civil society, and the private sector) to close this gap.

Promising partnerships already exist across Europe and globally, for example, The King's Trust works with Apple to deliver targeted digital skills programs to underserved youth in the UK, including those in alternative education settings. Similarly, global funders such as HSBC have helped deliver tailored digital training in also diverse contexts, including India, Malaysia, and Malta.

At a European level, organisations like DIGITALEUROPE call for even deeper partnerships, including a proposed "Rapid Training Fund" for industry-led upskilling. Rather than creating new pilot projects from scratch, funding mechanisms should also prioritise scaling up effective existing partnerships. These include initiatives such as AWS re/Start, which trains unemployed individuals for careers in cloud computing, and Accenture's Skills to Succeed Academy, which offers modular, accessible training in coding, digital literacy, and AI awareness.

From a strategic perspective, PES (Prompt Engineering Skills) can act as a catalyst within these partnerships, especially when they focus on building youth confidence, linking training with real career opportunities, and embedding tools like storytelling and AI into the learning process. The Skill IT for Youth project demonstrates that partnerships with NGOs can help address local needs and strengthen youth work capacities, particularly in non-formal education settings where innovation is often greater. However, this requires structural support: many youth workers still lack the training, tools, and institutional backing to deliver meaningful digital upskilling.

## 6.2 Prompt Engineering Skills as a Bridge Between Formal and Non-Formal Learning

PES methodologies are well-suited to bridging the divide between formal and non-formal education. Their flexibility and modular design allow them to reach learners both inside and outside institutional frameworks. Formal systems across Europe often struggle to update curricula at the speed demanded by digital transformation. In many countries, digital skills are only partially integrated into primary or secondary education, and even at university level, specialised digital programs remain limited and fragmented. In contrast, non-formal education (especially when supported by civil society and international funding) has shown better adaptability. Initiatives like Skill IT for Youth have demonstrated how youth organisations can step in to deliver digital skills development, often in more engaging, culturally relevant ways.

However, a sustainable bridge between these sectors requires serious coordination and investment. PES approaches offer a practical framework: they combine foundational knowledge (e.g., digital literacy) with higher-order skills (e.g., prompt engineering, AI ethics, creativity) that can be applied in both school-based and informal contexts. They also support personalised learning pathways, which can adapt to different learner profiles, a crucial feature for reaching marginalised or underserved groups.

For this bridge to function, educators (in both formal and non-formal settings) must be upskilled. Teacher training remains inconsistent across Europe, and many educators report feeling unprepared to teach digital topics. This calls for targeted professional development as well as mutual recognition of learning across sectors. The DIGITALEUROPE initiative “Teachers for the Digital Decade” could serve as a model, proposing standardised qualifications to boost digital competence at all levels.

Ultimately, PES can help harmonise efforts across sectors by offering shared tools, language, and goals. As both a pedagogical and strategic framework, PES encourages collaborative learning that blends formal rigour with the creativity and responsiveness of non-formal spaces. This hybrid model is essential for realising the digital skills and social inclusion targets of the Digital Decade.



## 7. Risks and Challenges in Prompt Engineering Skills Implementation

### 7.1 Digital Divide and Infrastructure Gaps

One of the most significant challenges for implementing Prompt Engineering Skills (PES) initiatives lies in the persistence of the global digital divide. While the COVID-19 pandemic initiated a major increase in digital connectivity (with 466 million people going online for the first time in 2020), an estimated 2.7 billion people remained offline as of 2022, and more than half the world still lacked access to high-speed broadband. This gap reflects not only infrastructural limitations but also overlapping inequalities.

As Landry Signé points out, the divide encompasses physical, financial, socio-demographic, cognitive, institutional, political, and cultural forms of access, each of which can independently or collectively prevent individuals from participating meaningfully in the digital world.

These exclusions are particularly severe in rural areas and developing regions. While internet penetration reaches 89 per cent in Europe, it drops to 61 per cent in Asia and only 40 per cent in Africa. Beyond geography, disparities are evident along gender and age lines: women are 7 per cent less likely to own a mobile phone and 16 per cent less likely to use mobile internet, and young people are disproportionately more connected than older generations. Even in countries with advanced digital infrastructure, inequalities persist. A 2024 study in the United Kingdom found that 45 per cent of families with children lacked the combination of access, equipment, and digital skills needed to participate fully in contemporary society. Those most affected included households from minority ethnic backgrounds, low-income groups, and families with disabled parents.

Digital exclusion acts as what one researcher called an “amplifier of other exclusions,” intensifying barriers to education, employment, and wellbeing. Without access to devices, stable internet, or functional skills, marginalized youth may be unable to benefit from the very programs designed to support them. The Guardian report emphasised that functional and critical digital skills are frequently missing among parents and children alike, with 38 percent of households struggling to meet basic competence levels. In many cases, families may own a smartphone or a single device, but struggle to share it among multiple users or lack the digital fluency required to use it for learning.

Initiatives to close these gaps do exist. The African Union's Digital Transformation Strategy, India's Digital India program, and the UN's Broadband Commission all frame digital inclusion as essential to broader social and economic development. Meanwhile, companies such as Google and SpaceX are experimenting with market-driven approaches like localised products and satellite broadband. But as Signé warns, the fragmented nature of these efforts, and the absence of a shared understanding among governments, corporations, and civil society, continues to hinder progress.

## **7.2 Resistance to Change and Curriculum Rigidities**

In addition to structural and technological constraints, the implementation of PES also faces pedagogical and institutional challenges, particularly in the form of resistance to change within education systems. Research by Lomba-Portela et al. demonstrates that while most teachers do not express opposition to innovation, many experience frustrations with the top-down nature of reforms and the overload of responsibilities placed on them. Legislative changes and frequent policy shifts are viewed with scepticism, especially when they lack grounding in classroom realities or fail to involve teachers in meaningful ways. In their study of over 1,000 educators in Galicia, the authors found that teachers expressed greater resistance when they perceived reforms as externally imposed or irrelevant to their specific teaching context.

Older teachers and those in public institutions were statistically more likely to resist methodological changes, often citing past experiences of unproductive reforms or a sense of professional autonomy being undermined. Many reported relying more on personal teaching experience than on mandated pedagogical shifts, reflecting a lack of trust in external initiatives. This presents a direct obstacle to PES integration, as the approach requires not only technological readiness but also openness to interdisciplinary, learner-driven methods. When educators are not supported with sufficient training, institutional backing, or curriculum flexibility, PES may be treated as an optional add-on rather than embedded into core pedagogical practice.

Compounding this issue is the limited digital confidence among educators themselves. While students are often assumed to be "digital natives," many teachers (especially those trained before the digital transformation of education) do not feel equipped to teach with or through technology. As the Guardian study showed, digital exclusion is not just about material access but also involves a psychological and functional dimension: individuals may have access to the internet but feel uncertain or anxious about using it for meaningful engagement, especially in learning contexts. Without sustained investment in professional development, the implementation of PES will likely remain uneven, failing to reach those who could benefit most.

## 8. Conclusion and Recommendations

### 8.1 Summary of Key Findings

The preceding analysis has shown that while digital transformation offers opportunities for youth empowerment through Prompt Engineering Skills (PES), its success depends on confronting structural barriers. The main one among these is the global digital divide, which still excludes 2.6 billion people (predominantly women, low-income families, and marginalised communities) from reliable internet access and participation in the digital economy. Even where infrastructure exists, affordability, usability, and digital literacy remain persistent issues.

This divide is deeply entangled with socioeconomic inequality. Families in underserved areas often face multiple layers of disadvantage: unreliable broadband, insufficient devices, and limited ability to navigate online platforms. These gaps contribute not only to reduced access to education, employment, and healthcare but also to intergenerational inequality. In education alone, millions of students continue to be left behind due to connectivity or device gaps.

Crucially, the digital divide is not a singular problem with a technical fix; it reflects the systemic exclusion of marginalised groups from policymaking, infrastructure investments, and economic opportunity. Without addressing these inequities, PES initiatives risk becoming another inaccessible tool, rather than a vehicle for empowerment.

### 8.2 Policy Recommendations

To ensure that Prompt Engineering Skills (PES) fulfil their inclusive potential, digital inclusion must be embedded into broader educational and social strategies at both the EU and national levels. European states must begin by strengthening community-led broadband infrastructure. Municipal broadband initiatives have demonstrated the capacity to offer faster, more affordable services, particularly in areas where commercial providers fail to invest. In several EU countries, public libraries, schools, and social centres already act as informal access hubs. Scaling up their digital capacity would offer immediate relief to families struggling with unstable home connections, especially in rural or low-income regions.

Alongside access, digital skills must be prioritised as a core component of lifelong learning systems. The European Commission's Digital Education Action Plan and Digital Competence Framework (DigComp) provide guidance, but national uptake remains uneven. Countries should integrate digital literacy across all levels of education, from early schooling to vocational and tertiary training, while also supporting non-formal education providers. As the OECD has emphasised, this should include both foundational competencies and higher-order skills such as digital safety, content creation, and critical data literacy. Higher education institutions and employers alike must offer modular upskilling opportunities, particularly for educators and frontline youth workers, who often lack the support to teach digital topics confidently.

Public funding mechanisms at both EU and member state levels must prioritise inclusive digital learning programs that are co-developed with local communities. Erasmus+ and European Social Fund Plus (ESF+) calls should support initiatives like Inclusive Digital Education for Families with Fewer Opportunities, which provided not only devices but also practical digital literacy training designed with and for disadvantaged families. Similarly, the Blended Learning for Inclusion project focused on building the digital capacities of teachers working with migrant and minority youth. These examples demonstrate the potential of PES approaches when supported by bottom-up, community-driven innovation.

To coordinate these efforts, European stakeholders should support the creation of digital inclusion coalitions. These coalitions bring together municipalities, civil society, educational institutions, and private actors to plan and deliver context-sensitive digital equity strategies together. While this model emerged in the US, it offers clear relevance for the EU context, where National Digital Skills and Jobs Coalitions under the Digital Decade framework already exist but require further grassroots coordination and sustained investment.

Finally, inclusive design must be enforced across all digital educational tools. Platforms and resources used in PES delivery must comply with EU accessibility standards, support multiple languages, and meet the needs of learners with disabilities. As noted in the OECD's research on inclusive innovation, equity by design is critical to ensure that digital transformation does not reinforce existing exclusions. If digital tools, including those powered by AI, are to support learners from underrepresented communities, they must be developed and implemented with their diverse needs in mind.

### **8.3 Call to Action for Educators, Institutions and employers**

The successful implementation of Prompt Engineering Skills (PES) depends not only on national policies and funding streams but also on the everyday commitment of educators, learning institutions, and employers across Europe. These actors are on the front lines of the digital inclusion agenda and have both the capacity and the responsibility to transform abstract strategies into tangible opportunities for young people.

Educators must be empowered to integrate PES into their teaching practices, not just as an add-on but as a pedagogical shift. For this to happen, teachers require ongoing professional development tailored to emerging digital trends. Initiatives like DIGITALEUROPE's Teachers for the Digital Decade provide useful models, offering micro-credentials and standardised training that reflect real classroom needs. Teacher training should not only cover technical tools, but also support ethical, inclusive, and creative digital pedagogy. Educators are uniquely positioned to foster students' critical digital literacy and confidence, but they must be supported through institutional commitment, time, and resources.

Learning institutions, especially in formal education, play a pivotal role in bridging gaps between curricular standards and digital reality. Many European education systems remain slow to adapt to the pace of technological change, leaving significant gaps between what is taught and what is needed in the labor market. PES provides a modular and flexible tool to close this gap, particularly when embedded into interdisciplinary teaching, civic education, and vocational training. Institutions should also strengthen links with non-formal education actors (such as youth organisations, cultural centres, and NGOs) who often lead the way in innovation and outreach to marginalised groups.

Employers must also reframe their role as stakeholders in the learning ecosystem. Rather than viewing digital skills as a hiring problem, businesses should see themselves as co-educators. This includes offering work-based learning opportunities, co-developing training curricula with education providers, and actively supporting inclusive hiring practices. European initiatives such as AWS re/Start and the Skills to Succeed Academy by Accenture demonstrate how private sector actors can help close digital gaps when their strategies align with inclusive social goals. Employers also have a unique opportunity to model ethical AI usage and promote digital wellbeing in the workplace, values that young learners will carry into their own professional and civic lives.

Ultimately, the call to action is clear. If PES is to succeed as a tool for social inclusion, its implementation must extend beyond policy frameworks into the daily practices of teaching, learning, and working. Educators, institutions, and employers must act not in parallel but in partnership, creating a shared culture of digital responsibility, innovation, and care.

# Part 2. Strategies for embedding PES into NFL and PBL methods, including lesson plans and activities

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The flexibility of the Prompt Engineering Skills (PES) makes it ideally suited for integration into both Non-Formal Learning (NFL) contexts and Project-Based Learning (PBL) methods. These approaches prioritize experiential, learner-driven, and collaborative learning environments—perfect conditions for building AI literacy and transversal skills in inclusive ways.

## 1. Introduction to Non-Formal and Project-Based Learning

Non-formal learning (NFL) and project-based learning (PBL) represent two of the most dynamic and learner-centred approaches developed in the last decades of educational practice. While formal education is primarily bound by curricula, institutional structures, and standardised assessment, NFL and PBL have emerged as complementary approaches that emphasise flexibility, participation, and authentic engagement with knowledge.

### 1.1 Definitions and Key Characteristics of NFL and PBL

#### **Non-Formal Learning (NFL).**

The concept of non-formal learning was first articulated in the 1970s, when Coombs and Ahmed distinguished it from both formal and informal education. NFL is characterised by its structured yet flexible design, its voluntary participation, and its focus on the needs of the learner rather than institutional requirements. Typical examples include youth workshops, afterschool programs, summer camps, community projects, or digital learning hubs. In youth contexts, NFL emphasises personal growth, social responsibility, and participatory learning, often prioritising empowerment and inclusion over standardised outcomes.

#### **Project-Based Learning (PBL).**

PBL, by contrast, is a pedagogical method rooted in constructivist and experiential theories of education. It centres learning around complex, authentic challenges that require sustained inquiry and collaboration.

Dewey's philosophy of experiential education and Vygotsky's emphasis on social constructivism underpin the method, highlighting the idea that learners build knowledge through active engagement and dialogue. A PBL project may last from several weeks to an entire semester and culminates in a tangible product, presentation, or solution. Its defining characteristics include:

- inquiry-driven processes,
- interdisciplinarity,
- iterative prototyping, and
- structured reflection.

## Common ground.

Although different in origin and structure, NFL and PBL converge on key principles: active participation, learner agency, collaboration, and problem-solving. These principles resonate strongly with the European Union's Key Competences for Lifelong Learning, which include digital literacy, civic participation, and learning-to-learn competences. Such alignment creates a fertile ground for the integration of Prompt Engineering Skills (PES), a transversal competence essential in the age of artificial intelligence.

### 1.2 Why Prompt Engineering Skills Fits Perfectly in NFL and PBL Contexts

The rise of generative AI systems has forced educators worldwide to reconsider how learners develop digital, critical, and creative literacies. Prompt Engineering Skills (PES)—defined as the ability to design, refine, and evaluate prompts for AI systems—represent a new transversal competence that bridges creativity, computational thinking, ethics, and civic responsibility.

In **NFL** contexts, **PES** can be integrated seamlessly because the methods prioritise hands-on experimentation, collaborative meaning-making, and learner agency. Learners can interact with AI as a creative partner in tasks such as storytelling, design, or community problem-solving. Unlike rigid curricula, NFL allows rapid adaptation of activities: facilitators may test short, iterative exercises where participants compare AI outputs, refine prompts, and reflect critically.

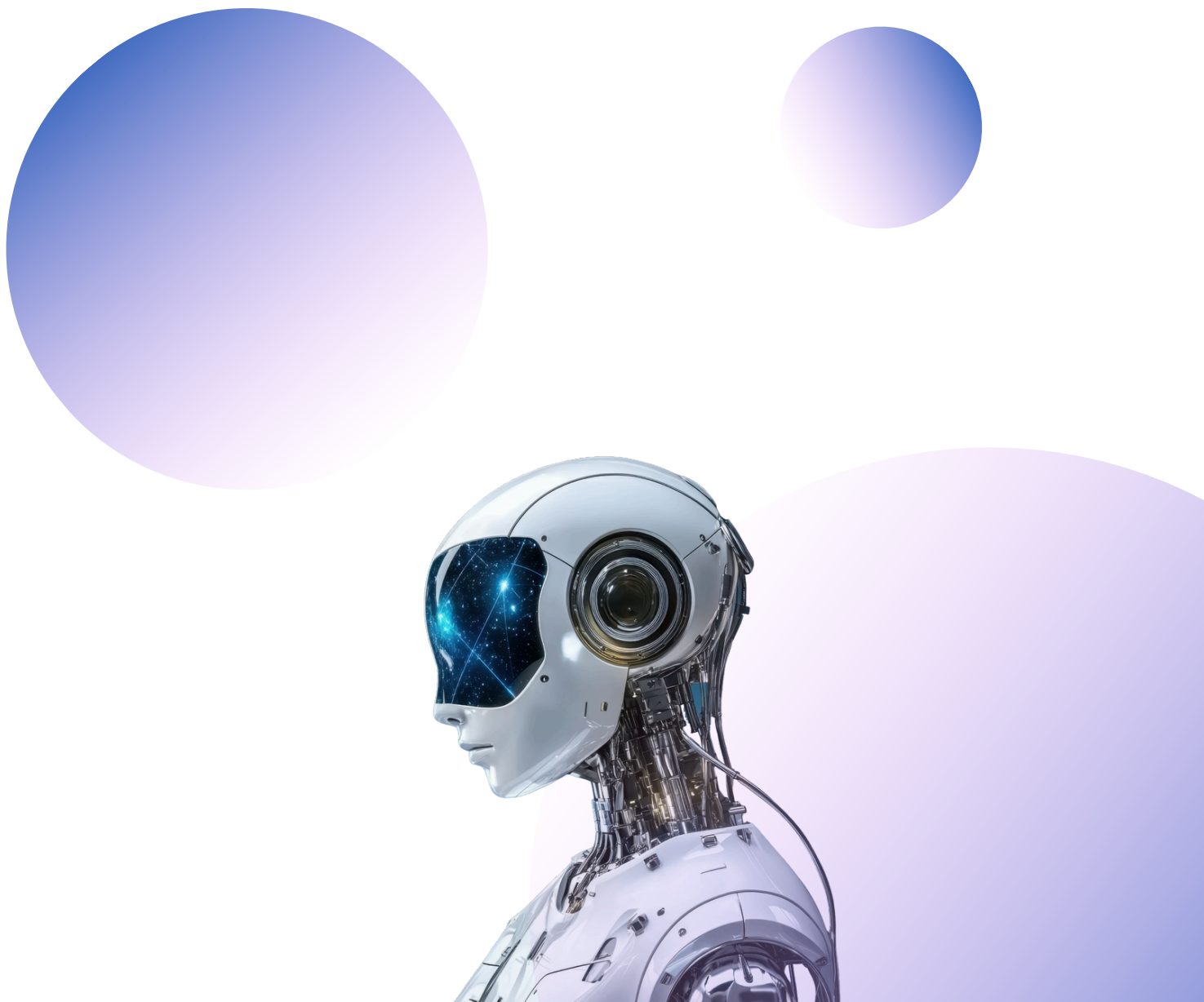
In **PBL** contexts, **PES** enhances the methodology by providing learners with a powerful toolkit for inquiry and ideation. Projects that address real-world issues—climate change, urban sustainability, cultural identity—can be scaffolded using PES at every stage: framing research questions, brainstorming solutions, testing prototypes, and reflecting on ethical implications. In this sense, PES is not only compatible with NFL and PBL but elevates their potential by connecting learners with the very technologies shaping contemporary society.

### 1.3 Purpose of This Guide

The present guide seeks to provide educators, trainers, and facilitators with **concrete strategies** for embedding PES into NFL and PBL contexts. Its objectives are threefold:

1. To provide a **theoretical rationale** for aligning PES with learner-centred pedagogies.
2. To propose **methodological frameworks** that integrate PES within diverse learning environments.
3. To offer **practical lesson plans and session templates** for implementation in youth programs, schools, and community projects.

Beyond methodology, the guide also considers ethical risks (bias, misinformation, over-reliance on AI), assessment challenges (capturing creativity and ethics rather than technical skill alone), and sustainability issues (scaling PES programs in youth and educational systems). Ultimately, its purpose is to empower educators to use PES as a catalyst for inclusive, critical, and innovative learning experiences.



## 2. Principles of Prompt Engineering Skills (PES) in Non-Formal and Experiential Learning

Prompt Engineering Skills thrive in environments that value flexibility, inclusion, personalisation, empowerment, and human rights. Each of these principles is strongly aligned with the ethos of NFL and PBL, making PES a natural fit for both methodologies.

### 2.1 Flexibility, Inclusion, and Personalization

One of the most important features of PES is its adaptability. Learners can design prompts in diverse modalities—text, images, audio, or multimodal—depending on their strengths and interests. In an NFL workshop, for example, some learners may prefer storytelling prompts, while others experiment with visual AI tools for poster design. This flexibility reflects constructivist principles, where knowledge emerges from active exploration rather than passive reception.

Inclusivity is reinforced when facilitators encourage learners to develop prompts rooted in their cultural contexts, languages, or identities. For instance, an intercultural youth camp might involve participants designing prompts that reflect local traditions, then comparing how AI tools interpret cultural diversity. Personalisation is achieved by allowing learners to connect prompts to their own curiosities or creative goals, thereby enhancing ownership and motivation.

### 2.2 Aligning PES Objectives with Youth Participation and Empowerment

Youth work emphasises participation, empowerment, and voice—values that PES directly supports. Learners are not treated as passive consumers of AI-generated content but as co-creators of meaning. Through prompt design, they exercise agency over digital tools, experiment with different strategies, and critically reflect on issues such as bias, inclusivity, and fairness.

Facilitators can guide discussions on questions such as: What assumptions does this AI output reveal? Who benefits, and who is excluded? How can prompts be refined to produce more inclusive outputs? These reflections directly link PES to democratic citizenship and digital ethics, ensuring that learners develop not only technical but also civic competences.

## 2.3 Integration with Human Rights

Embedding PES into NFL and PBL also requires a human rights framework. According to the Council of Europe’s Charter on Education for Democratic Citizenship and Human Rights Education, youth programs must foster equality, participation, and critical thinking. PES activities can directly support these objectives by encouraging learners to analyse AI outputs through a rights-based lens.

For example, facilitators might ask learners: *How could AI reinforce or challenge stereotypes? What prompts reveal hidden biases? What role should young people play in shaping ethical AI?* By framing PES in terms of human rights, educators ensure that it moves beyond technical competence to address responsibility, accountability, and fairness in digital societies.

## 3. Designing Prompt Engineering Skills (PES) in Non-Formal Learning Contexts

Prompt Engineering Skills (PES) can be effectively integrated into diverse non-formal learning (NFL) environments, ranging from youth centres and afterschool programs to summer camps and digital communities. Unlike formal education, which is typically bound by fixed curricula and assessment standards, NFL offers flexible, voluntary, and context-driven opportunities for learners to experiment, co-create, and reflect. The adaptability of NFL makes it particularly suitable for introducing PES, which thrives in experimental, creative, and collaborative environments.

### 3.1 Learning Settings (youth centers, camps, afterschool programs, digital spaces)

NFL takes place in a variety of learning ecosystems, each of which can serve as fertile ground for embedding PES:

- **Youth centres** often provide community-based environments where young people gather for extracurricular and civic activities. In these contexts, PES can be introduced as part of digital literacy clubs, media workshops, or hackathons. For example, a youth centre might organise a “Prompt Lab” where participants design and test AI-generated stories that reflect local cultural narratives.
- **Afterschool programs** provide structured but flexible enrichment opportunities. Here, PES can be integrated into STEM clubs, robotics projects, or creative writing workshops, supporting learners to use AI as both a research and creative partner.

- **Summer camps** offer immersive experiences, often focused on outdoor learning, intercultural exchange, or leadership development. Facilitators can incorporate PES through collaborative projects such as designing AI-assisted campaign posters on environmental issues or co-creating interactive storytelling games.
- **Digital spaces** (online platforms, forums, and collaborative apps) provide real-time access to AI tools. Learners can experiment with prompts on shared platforms, compare outputs, and engage in critical discussions moderated by facilitators. This mode ensures inclusivity, allowing learners from geographically diverse backgrounds to participate.

Each of these settings provides unique affordances: while face-to-face spaces foster group collaboration and embodied interaction, digital platforms facilitate real-time experimentation and scalability.

### 3.2 Tools and Techniques (storytelling, role play, simulation, visual learning)

Effective integration of PES in NFL relies on **creative pedagogical techniques** that match the exploratory ethos of youth work. Among the most relevant are:

- **Storytelling.** Narratives represent a powerful medium for both cultural transmission and creative experimentation. Learners can design prompts that instruct AI to generate alternative endings to folk tales, create hybrid cultural myths, or simulate dialogues between historical figures. This enhances not only digital skills but also intercultural understanding.



- **Role play.** Through role-based prompting, learners simulate complex scenarios, such as negotiating climate policies or debating ethical dilemmas with AI-generated personas. This approach aligns with experiential learning principles and encourages empathy, perspective-taking, and critical dialogue.
- **Simulation.** Learners can design prompts that model real-world problem-solving contexts, such as “What strategies might a city adopt to reduce plastic waste?” By comparing AI-generated solutions, learners practise critical evaluation, decision-making, and group consensus-building.
- **Visual learning.** With the rise of multimodal AI systems, learners can generate images, posters, or infographics based on carefully designed prompts. This fosters creativity and visual literacy while raising critical awareness about how AI represents cultural symbols and identities.

By embedding PES into these methodologies, facilitators enable learners to experiment with multiple literacies—textual, visual, and critical—while exercising agency over digital tools.

### 3.3 Structuring Short-Term Interventions and Modular Workshops

NFL activities are often short-term, making modularity a key strategy for embedding PES. Workshops can be organised in progressive modules, each focusing on a specific aspect of prompt design and AI interaction:

- Introduction to prompts - learners explore basic cause-effect relations (input vs output)
- Iterative refinement - learners adjust and compare prompts to observe differences
- Critical evaluation - groups assess AI outputs in terms of accuracy, inclusivity, and creativity
- Ethical considerations - discussions on bias, stereotypes, and responsible AI use

Each module can be delivered as a standalone 45-60 minute workshop or as part of a multi-day program. This modularity ensures scalability and adaptability to diverse contexts, from short youth exchanges to semester-long afterschool initiatives.

Moreover, modular interventions can be tailored to different age groups and skill levels. For beginners, facilitators may start with simple tasks such as generating fun stories or quiz questions. For advanced learners, more complex tasks could include designing prompts for research synthesis, scenario planning, or social media campaigns.

### 3.4 Working with Community Stakeholders

NFL thrives when connected to real-world contexts. Engaging stakeholders such as local NGOs, schools, municipal authorities, and technology companies enhances the authenticity and impact of PES workshops. Partnerships can provide:

- **Access to real challenges.** For example, an NGO working on sustainability may ask learners to design AI prompts that generate awareness-raising materials for recycling.
- **Technical support.** Technology companies or universities can provide AI platforms and expertise.
- **Social recognition.** Community stakeholders can showcase learners' AI-supported projects in exhibitions, local events, or online campaigns.

Such collaborations ensure that PES activities remain relevant, socially grounded, and oriented towards civic engagement. They also align with the broader goals of the EU Youth Strategy, which emphasises participation, innovation, and connection between young people and their communities.



## 4. Embedding Prompt Engineering Skills (PES) in Project-Based Learning Approaches

Project-Based Learning (PBL) has long been recognised as a powerful framework for inquiry-based and experiential education, where learners engage with authentic, complex problems over extended periods. Integrating Prompt Engineering Skills (PES) into PBL enhances this methodology by equipping learners with tools to navigate, question, and co-create knowledge in collaboration with generative AI systems. The synergy between PBL and PES is grounded in their shared emphasis on creativity, critical thinking, collaboration, and reflection.

### 4.1 PBL Phases: Inquiry Research Design Test Reflect

The classic cycle of PBL (inquiry, research, design, test, and reflect) aligns naturally with the iterative practices of prompt engineering.

- **Inquiry.** At the beginning of a project, learners are encouraged to formulate essential questions. By engaging with AI through carefully designed prompts, they can generate diverse perspectives on a chosen topic. For example, a group investigating *“How can cities become more climate-resilient?”* may design prompts that elicit strategies from the perspective of different stakeholders (urban planners, citizens, policy-makers).
- **Research.** Learners use AI-generated content alongside human sources to identify knowledge gaps, compare data, and synthesise information. Prompt refinement plays a crucial role here, as learners learn to phrase questions in ways that improve accuracy and relevance. This stage reinforces critical digital literacy, as students must cross-check AI responses against credible human sources.
- **Design.** In this stage, learners co-create solutions or prototypes. PES allows them to iteratively generate, refine, and evaluate design ideas, policy proposals, or creative outputs. For instance, an AI-assisted design sprint may involve learners testing prompts to visualise alternative urban layouts or draft different versions of a public awareness campaign.
- **Test.** Testing in PBL requires applying solutions to practical contexts. Learners can prompt AI tools to simulate the possible outcomes of their solutions, compare alternatives, or forecast risks. Here, PES functions as a critical tool for scenario modelling and for anticipating unintended consequences.

- **Reflect.** Reflection is the cornerstone of both PBL and PES. Learners must evaluate not only the quality of their outputs but also the role AI played in shaping their understanding. Questions such as “How did our prompt influence the outcome?” or “What ethical issues emerged during this process?” ensure that reflection goes beyond technical accuracy to address critical awareness.

By embedding PES across all phases of PBL, educators foster meta-cognitive awareness—learners recognise how the act of questioning and designing prompts shapes the knowledge they co-construct.

## 4.2 Interdisciplinary Project Design Using Prompt Engineering Skills

One of the strengths of PBL is its interdisciplinary orientation. Prompt Engineering Skills naturally enhance this dimension by bridging STEM fields with the arts and humanities.

- **In science education,** students can design prompts to generate hypotheses, predict outcomes, or model scientific processes. For example, biology students may ask an AI system to generate possible explanations for biodiversity loss in a local ecosystem, then test these explanations through field research.
- **In arts and humanities,** learners can experiment with creative prompts to co-author poetry, simulate historical debates, or generate visual art. Such projects develop critical reflection on authorship, originality, and creativity in the age of AI.
- **In social sciences,** PES can be used to model public policy debates, analyse economic scenarios, or simulate community dialogues. By designing prompts from different perspectives (e.g., government, NGOs, citizens), learners practise empathy and multi-stakeholder analysis.

This interdisciplinarity positions PES as a **connector skill**, enabling learners to transfer AI literacy across domains while remaining critically aware of its strengths and limitations.

### 4.3 The Role of the Facilitator in a PBL Setting

Facilitators are crucial actors in embedding PES within PBL. Unlike traditional teachers, they act as coaches, guides, and critical friends who support learners in navigating both the opportunities and the risks of AI. Their responsibilities include:

- **Scaffolding prompt design.** Facilitators introduce learners to the basics of prompt engineering, then gradually encourage more advanced strategies such as iterative refinement, role-based prompting, and multimodal inputs.
- **Encouraging critical evaluation.** Learners must not accept AI outputs uncritically. Facilitators guide them to compare, fact-check, and interrogate results.
- **Modelling ethical awareness.** By openly discussing issues such as bias, misinformation, and intellectual property, facilitators set the tone for responsible AI use.
- **Balancing AI use with human creativity.** Facilitators remind learners that AI is a tool, not a substitute for critical thinking, empathy, or originality.

This role requires facilitators to develop their own PES competences, ensuring they are comfortable not only with technical aspects but also with pedagogical strategies for fostering agency, ethics, and reflection.

### 4.4 Benefits and Challenges of Embedding PES in PBL

Embedding PES into PBL generates a range of pedagogical benefits, but also raises critical challenges.

#### Benefits include:

- Enhanced learner engagement through creative AI-supported exploration;
- Development of transversal competences (critical thinking, collaboration, digital literacy);
- Increased authenticity of projects through real-world AI applications;
- Preparation of learners for future labor markets and civic participation.

#### Challenges include:

- Risk of over-reliance on AI tools rather than human creativity;
- Unequal access to technology, creating digital divides;
- Potential reinforcement of biases or misinformation if learners lack critical frameworks;
- Need for teacher/facilitator training in PES and ethical AI literacy.

Addressing these challenges requires systematic pedagogical design, institutional support, and policies that ensure equitable access and ethical standards in AI-assisted learning.

## **5. Detailed Session Templates and Lesson Plans**

While the previous sections outlined the theoretical and methodological foundations for embedding Prompt Engineering Skills (PES) in educational practice, this section provides practical, ready-to-use session plans for both Non-Formal Learning (NFL) and Project-Based Learning (PBL). The templates follow an experiential learning cycle (experience, reflection, conceptualisation, application) and are adaptable to different age groups, contexts, and durations.



## 5.1 NFL Session Plan 1: “Is it AI or Not?” (Awareness)

Learners develop critical awareness of AI-generated content and learn to distinguish between human and machine-created outputs.

- **Objective:** raise awareness of AI-generated vs. human-generated content.
- **Method:** learners compare short texts/images and identify whether they are AI or human-created.
- **Debrief:** discuss criteria for credibility, creativity, and authenticity.

Component	Description
Duration	45 minutes
Resources	Printed texts/images (some AI-generated, some human-made), projector, whiteboard
Steps	1. Icebreaker – brief introduction to AI tools (5 min). 2. Group activity – learners receive mixed outputs and decide whether they were created by humans or AI (20 min). 3. Whole group discussion – analysis of criteria used to decide (10 min). 4. Facilitator input on prompt influence and detection challenges (5 min). 5. Reflection circle – “How do we judge authenticity in the digital age?” (5 min).
Expected outcomes	Learners understand how prompts shape AI outputs and develop critical thinking regarding authenticity.
Assessment	Peer discussion, facilitator observation, short reflection notes.

## 5.2 NFL Session Plan 2: “AI in My Life” (Creative Expression)

- **Objective:** Learners explore the role of AI in their personal and social lives through creative prompts.
- **Activity:** each participant crafts prompts to generate AI outputs reflecting their vision of AI’s role.
- **Outcome:** group exhibition of generated works, followed by peer reflection.

Component	Description
Duration	60 minutes
Resources	Printed texts/images (some AI-generated, some human-made), projector, whiteboard
Steps	1. Brainstorm – participants reflect on ways AI already influences daily life (10 min). 2. Prompt creation – in pairs, learners design prompts to visualise “AI in my future life” (20 min). 3. Output exhibition – groups showcase AI-generated images/texts on posters (15 min). 4. Gallery walk and peer feedback (10 min). 5. Debrief – discussion of positive/negative roles of AI (5 min).
Expected outcomes	Learners express personal visions of AI, critically analysing benefits and risks.
Assessment	Peer feedback on clarity/creativity of prompts; group reflection.

### 5.3 PBL Project Plan 1: “Design an AI Tool for a Community Problem”

- **Objective:** Learners identify and reflect on biases present in AI-generated content.
- **Scenario:** Learners identify a real issue in their community (e.g., recycling, traffic safety, youth mental health) and design prompts to generate AI-assisted solutions.
- **Task:** teams design prompts that guide AI to generate potential solutions.
- **Product:** prototype proposals presented to stakeholders.

Component	Description
Duration	4–6 weeks (weekly sessions)
Resources	20–30 students (divided into teams)
Steps	<p>1. <b>Inquiry:</b> Learners research local problems (Week 1). 2. <b>Research:</b> Teams gather information and design initial prompts to explore possible solutions (Weeks 2–3). 3. <b>Design:</b> Learners refine prompts to co-create prototypes with AI (Weeks 4–5). 4. <b>Test &amp; Reflect:</b> Teams present prototypes to community stakeholders, receive feedback, and evaluate the role of AI (Week 6).</p>
Expected outcomes	Students produce prototype proposals addressing community needs; develop PES, teamwork, and civic responsibility.
Assessment	Rubrics assessing collaboration, prompt quality, creativity, and ethical awareness.

## 5.4 PBL Project Plan 2: “How Might AI Help or Harm the Environment?”

- **Objective:** Learners critically examine the impact of AI on sustainability through interdisciplinary inquiry.
- **Phases:** research, AI-supported idea generation, testing solutions, group reflection.
- **Outcome:** policy recommendations or awareness campaigns.

Component	Description
Duration	6–8 weeks
Resources	20–25 students
Steps	<p>1. Inquiry: Teams frame essential questions on AI and environment (Week 1). 2. Research: Students use PES to prompt AI for possible positive/negative scenarios (Weeks 2–3). 3. Design: Learners develop campaigns, simulations, or awareness tools (Weeks 4–6). 4. Test: Pilot outputs in school/community (Week 7). 5. Reflect: Final presentations and ethical debate (Week 8).</p>
Expected outcomes	Learners integrate scientific, ethical, and civic perspectives on AI; develop PES as a transversal competence.
Assessment	Presentations, peer feedback, reflective essays.

## 5.5 Reflections on Lesson Design

The proposed lesson plans highlight several pedagogical insights:

- PES can be scaled to short workshops (45–60 minutes) or extended PBL projects (6–8 weeks).
- Every activity should combine experimentation, collaboration, and reflection, ensuring that AI use does not overshadow critical thinking.
- Lesson plans must integrate ethical considerations (bias, inclusivity, sustainability) to align PES with democratic citizenship.
- Facilitators should adapt the intensity and complexity of prompts to learners' age, digital competence, and cultural background.

By providing concrete lesson templates, educators and trainers are better equipped to transform PES from an abstract competence into practical, learner-driven experiences that prepare young people for the opportunities and challenges of the AI era.

## Evaluation and Reflection in NFL/PBL Prompt Engineering Skills

Assessing Prompt Engineering Skills (PES) within Non-Formal Learning (NFL) and Project-Based Learning (PBL) presents unique challenges. Unlike formal education, which often relies on standardised testing and summative assessments, NFL and PBL emphasise competence development, collaboration, creativity, and reflection. Consequently, evaluation methods must move beyond technical accuracy to capture transversal competences such as ethical awareness, adaptability, and critical thinking.

### 6.1 Assessing Competencies in Non-Traditional Formats

Traditional exams are largely inadequate for measuring PES, as they cannot capture iterative processes of prompt refinement or the collaborative nature of PBL. Instead, educators should employ **alternative assessment strategies**, such as:

- **Reflective journals** – learners document their prompt design processes, iterations, and personal insights. This allows facilitators to assess growth in critical awareness and creativity
- **Peer feedback** – learners exchange and critique one another’s prompts and outputs, reinforcing collaborative learning and mutual accountability
- **Project showcases** – public exhibitions of outputs (e.g., AI-generated campaigns, prototypes) serve both as assessment and dissemination tools
- **Portfolios** – collections of prompts, AI outputs, and reflection notes that illustrate progression over time

These methods align with experiential education principles, emphasizing **process as much as product**.

## 6.2 Using Rubrics for Collaboration, Creativity, and Ethics

Rubrics provide transparency and fairness in assessment. To evaluate PES effectively, rubrics must go beyond technical correctness and include qualitative dimensions. A sample rubric might include:

Dimension	Beginner	Intermediate	Advanced
Prompt design	Writes simple prompts with limited specificity	Refines prompts to improve outputs	Designs complex, iterative prompts tailored to context
Creativity	Outputs show minimal originality	Outputs reflect some creative approaches	Outputs demonstrate originality, innovation, and personal voice
Collaboration	Limited contribution in group work	Participates actively and shares ideas	Facilitates teamwork and integrates diverse perspectives



Dimension	Beginner	Intermediate	Advanced
Ethical awareness	Limited recognition of bias/ethics	Identifies some issues of bias, inclusivity	Critically analyses ethical implications and proposes solutions

By integrating such rubrics, facilitators ensure that learners are rewarded not only for technical mastery but also for collaborative and ethical competences.

### 6.3 Public Sharing, Exhibitions, and Project Showcases

NFL and PBL both emphasise the importance of **public demonstration of learning**. Public showcases, whether in the form of exhibitions, community events, or online platforms, serve multiple purposes:

- **Assessment.** Learners demonstrate outputs to peers, facilitators, and external stakeholders.
- **Recognition.** Public events validate learners' work, strengthening motivation and self-confidence.
- **Civic engagement.** Sharing PES-based projects with communities ensures that learning remains relevant and socially grounded.

For instance, a PBL project on sustainability may culminate in a school-wide exhibition where students present AI-assisted policy proposals. Similarly, an NFL workshop might end with an online gallery of AI-generated artworks reflecting cultural diversity.

Such events also encourage learners to articulate the process behind their outputs—explaining how prompts were designed, refined, and critically evaluated. In doing so, learners demonstrate meta-cognition, recognising how their interactions with AI shape knowledge and meaning.



## 7. Building Ecosystems for NFL and PBL Integration

Embedding Prompt Engineering Skills (PES) within Non-Formal Learning (NFL) and Project-Based Learning (PBL) cannot be achieved through isolated workshops or projects alone. Instead, it requires the development of **ecosystems of practice**—sustainable networks of educators, institutions, stakeholders, and learners that provide structural support for innovation. An ecosystemic perspective ensures that PES integration moves beyond one-off interventions and becomes embedded in educational cultures, policies, and community practices.

### 7.1 Strategic Partnerships: Youth Workers, Schools, Tech Sector

Strategic partnerships form the backbone of successful PES integration. Collaboration across different sectors ensures access to expertise, resources, and real-world challenges.

- **Youth workers** bring experience in facilitating participatory and inclusive activities. Their role is to contextualise PES within youth development, emphasizing agency, empowerment, and democratic participation.
- **Schools and universities** provide structured settings where PES can be piloted as part of broader curricular or extracurricular initiatives. Their involvement ensures continuity and recognition of competences.
- **Technology companies** can provide platforms, tools, and mentorship. Involving the private sector, however, requires safeguards against commercial exploitation and a focus on ethical and educational values.

Partnerships should be formalised through memoranda of understanding, joint projects, or co-funded programs, ensuring that PES activities are sustainable and not dependent solely on individual facilitators.



## 7.2 Co-Designing Curriculum with Learners

Involving learners in the **co-design of PES curricula** enhances both relevance and ownership. This participatory approach reflects the principles of youth-centred education, where learners are recognised as active agents rather than passive recipients.

Practical strategies include:

- Needs assessments – learners articulate their expectations, interests, and digital habits before programs are designed
- Collaborative design workshops – facilitators and learners jointly create session structures, examples of prompts, and ethical scenarios
- Feedback loops – learners continuously evaluate the effectiveness of PES activities and propose adaptations

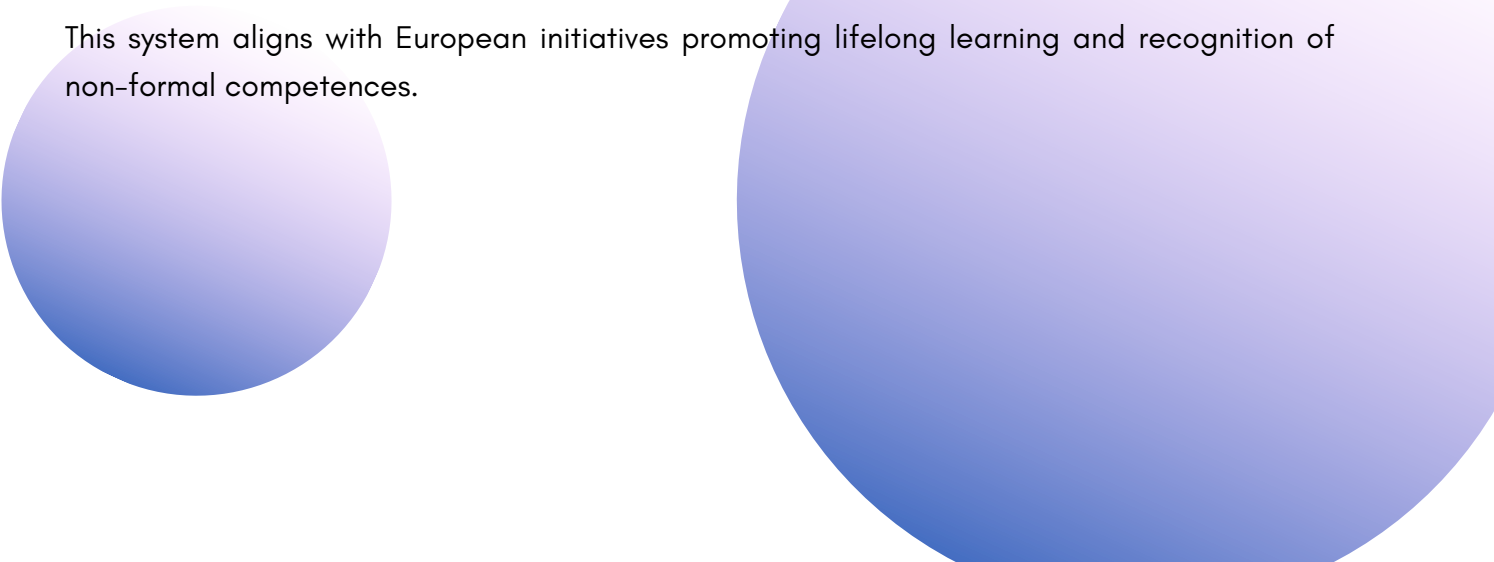
By engaging learners in curriculum design, PES integration becomes more democratic, context-sensitive, and adaptable to rapidly changing AI landscapes.

## 7.3 Blending Formal and Non-Formal Credentials (Micro-certification, Open Badges)

Recognition of PES competences is essential for motivating learners and ensuring long-term impact. Since NFL and PBL often take place outside traditional grading systems, alternative credentialing mechanisms such as micro-certifications and open badges can be employed.

- Micro-certifications validate specific PES competences, such as “Prompt Refinement,” “AI Bias Awareness,” or “Creative Prompting.”
- Open badges can be shared digitally on social media or CVs, providing visibility and recognition in both educational and professional contexts.
- Blended approaches may link badges with formal education systems, ensuring that skills acquired in youth programs are transferable to higher education or labor markets.

This system aligns with European initiatives promoting lifelong learning and recognition of non-formal competences.

The page features two large, overlapping blue circles at the bottom. The circle on the left is smaller and positioned towards the bottom left corner. The circle on the right is larger, extending from the bottom right towards the center, and partially overlaps the left circle.

## 7.4 Sustainability and Scaling of PBL/NFL Initiatives

For PES integration to be sustainable, programs must be supported by institutional frameworks, funding mechanisms, and policy alignment. Sustainability challenges include:

- Resource constraints - access to AI platforms, internet connectivity, and devices may be uneven
- Facilitator training - PES requires continuous professional development for educators and youth workers
- Policy gaps - without national or institutional policies recognising PES, activities risk remaining fragmented

### Scaling up successful initiatives demands:

- Evidence-based evaluation of PES programs;
- Advocacy for inclusion of AI literacy in educational policies;
- Cross-national cooperation for knowledge-sharing, especially through EU-funded programs (Erasmus+, Horizon Europe).

By addressing sustainability and scaling, PES integration moves from experimental workshops to **mainstream educational innovation**, accessible to a wide range of learners.

## 8. Conclusion and Future Directions

The integration of Prompt Engineering Skills (PES) into Non-Formal Learning (NFL) and Project-Based Learning (PBL) represents both an opportunity and a challenge for contemporary education systems. As AI technologies continue to reshape societies, labor markets, and communication practices, developing transversal competences that combine creativity, criticality, and ethics becomes indispensable.

NFL and PBL are particularly well-suited for PES because of their shared emphasis on active participation, collaboration, and real-world relevance. NFL provides flexible and inclusive spaces where learners can experiment freely with AI tools, while PBL offers structured frameworks for tackling authentic problems through inquiry and iterative design. Together, these methodologies create fertile ground for embedding PES as a transversal competence.

## 8.1 Summary of Strategies and Lessons Learned

This chapter has highlighted several strategies for embedding PES into NFL and PBL contexts:

1. **Aligning pedagogy with PES principles.** Flexibility, inclusivity, personalisation, empowerment, and human rights provide the theoretical foundation for integrating AI literacy into youth education.
2. **Designing practical interventions.** Modular NFL workshops (e.g., storytelling, bias check) and extended PBL projects (e.g., community problem-solving, sustainability campaigns) demonstrate how PES can be embedded in concrete settings.
3. **Developing ecosystems.** Partnerships between youth workers, schools, and technology providers, as well as micro-certifications and open badges, ensure sustainability and recognition of PES competences.
4. **Embedding reflection and ethics.** Every PES activity must include structured reflection on bias, inclusivity, and responsibility, ensuring that learners develop critical digital citizenship rather than uncritical reliance on AI systems.

## 8.2 Challenges and Opportunities Ahead

While promising, PES integration is not without obstacles:

- **Challenges.** Limited access to AI tools, uneven facilitator training, risk of digital divides, and absence of supportive policies may hinder implementation. Moreover, over-reliance on AI threatens to undermine human creativity if not carefully mediated.
- **Opportunities.** PES offers a pathway to strengthen AI literacy, foster civic engagement, and prepare young people for future labor markets. It can also function as a bridge between STEM and humanities, supporting interdisciplinary learning and innovation.

Future programs must therefore balance innovation with critical awareness, ensuring that PES enhances, rather than replaces, human judgement and creativity.

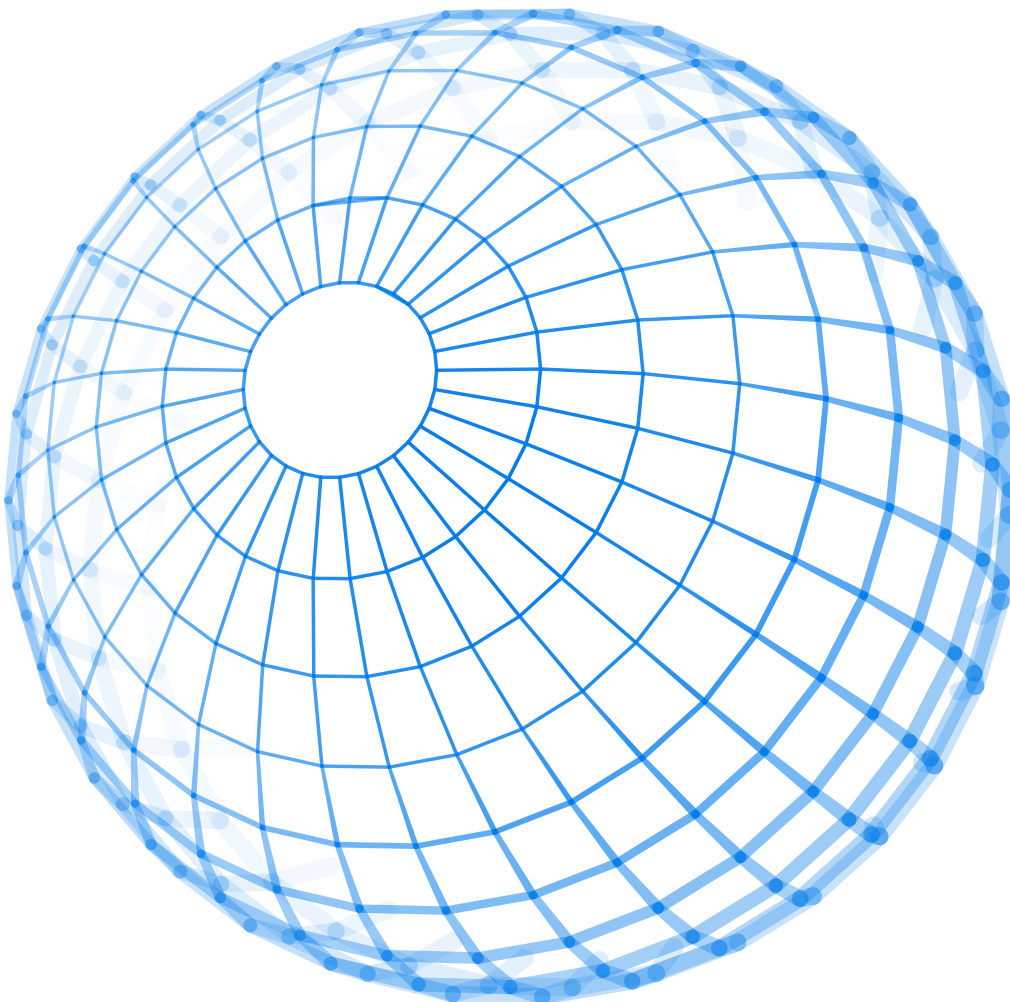


### 8.3 Recommendations for Trainers, Policymakers, and Youth Programs

Based on the analysis, several recommendations can be drawn:

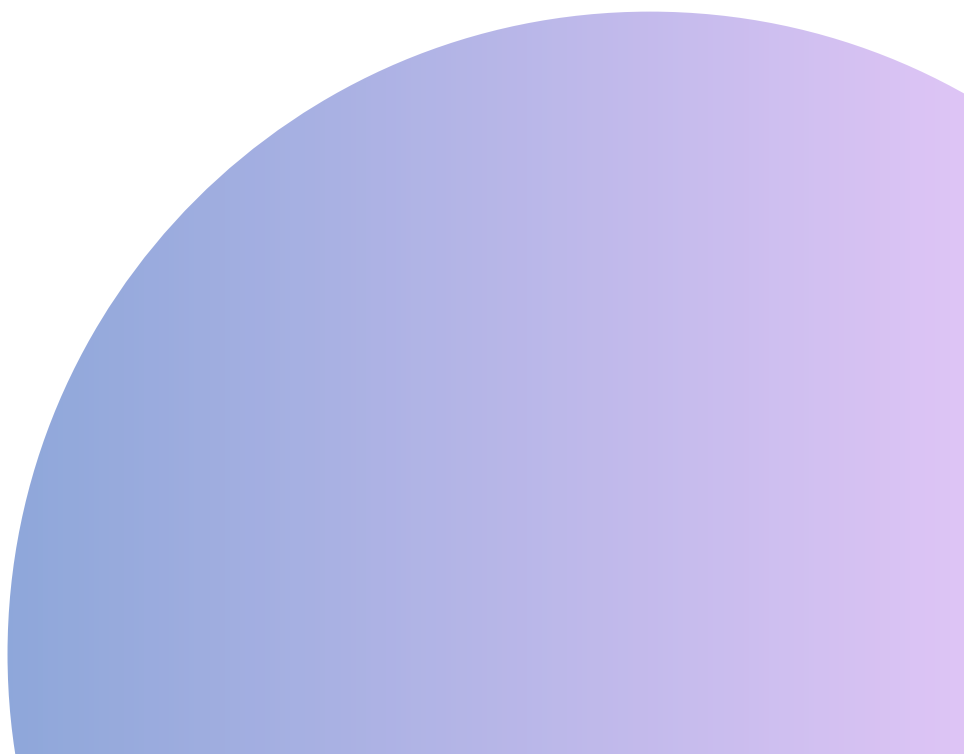
- **Trainers and facilitators** should prioritise ethical and reflective dimensions of PES, not just technical proficiency. Training programs for educators must include both technical familiarity with AI tools and pedagogical strategies for critical engagement.
- **Policymakers** should support PES integration through curricula, funding schemes, and national strategies on digital literacy. Alignment with frameworks such as DigCompEdu and the EU Youth Strategy can strengthen institutional legitimacy.
- **Youth programs and NGOs** should create inclusive and safe spaces where learners can experiment with PES, co-design activities, and share outputs with communities. Such programs can also promote diversity by engaging underrepresented groups in AI literacy.

If implemented systematically, PES has the potential to act as a catalyst for educational innovation, enhancing learners' competences not only in digital and creative domains but also in ethics, civic engagement, and democratic participation.



## Part 3.

**Guidance on using  
media tools (humor,  
visuals, storytelling)  
to make learning  
more engaging**



## 1. Introduction: Why Engagement Matters in AI Education

As artificial intelligence becomes increasingly embedded in education systems across Europe, engaging students in AI-related learning is not just a pedagogical challenge—it is a civic and ethical imperative. AI literacy today goes beyond technical understanding; it includes developing curiosity, agency, critical reflection, and a sense of ethical responsibility. A cross-national study by Daskalaki et al. (2024) found that while AI tools can enhance motivation, their impact depends heavily on how they are introduced. If used passively or without context, these tools risk promoting surface-level learning and undermining students' ability to reflect on the broader implications of AI.

Engagement in this context requires more than interactivity; it must help learners explore, question, and shape the AI technologies they encounter in everyday life. These include tools such as:

- Chatbots and virtual tutors (e.g., ChatGPT, Khanmigo), which simulate dialogue and offer tailored feedback.
- Recommendation systems (e.g., YouTube, Spotify), which show how algorithms personalise information and influence decision-making.
- Voice assistants (e.g., Alexa, Google Assistant), which help learners understand speech recognition and data collection.
- Language learning apps (e.g., Duolingo, Elsa Speak), which adapt to user progress through AI-based feedback loops.
- Creative AI tools (e.g., Grammarly, DALL·E, Adobe Firefly), which raise questions around authorship, originality, and human-machine collaboration.

Understanding how these systems work and how they affect users emotionally and socially is a key factor to developing critical, inclusive, and future-oriented AI education. Learners must be invited not only to use these tools but to reflect on the values they embed, the data they consume, and the roles they play in shaping knowledge and identity.

## 1.1 From Information Delivery to Connection and Emotion

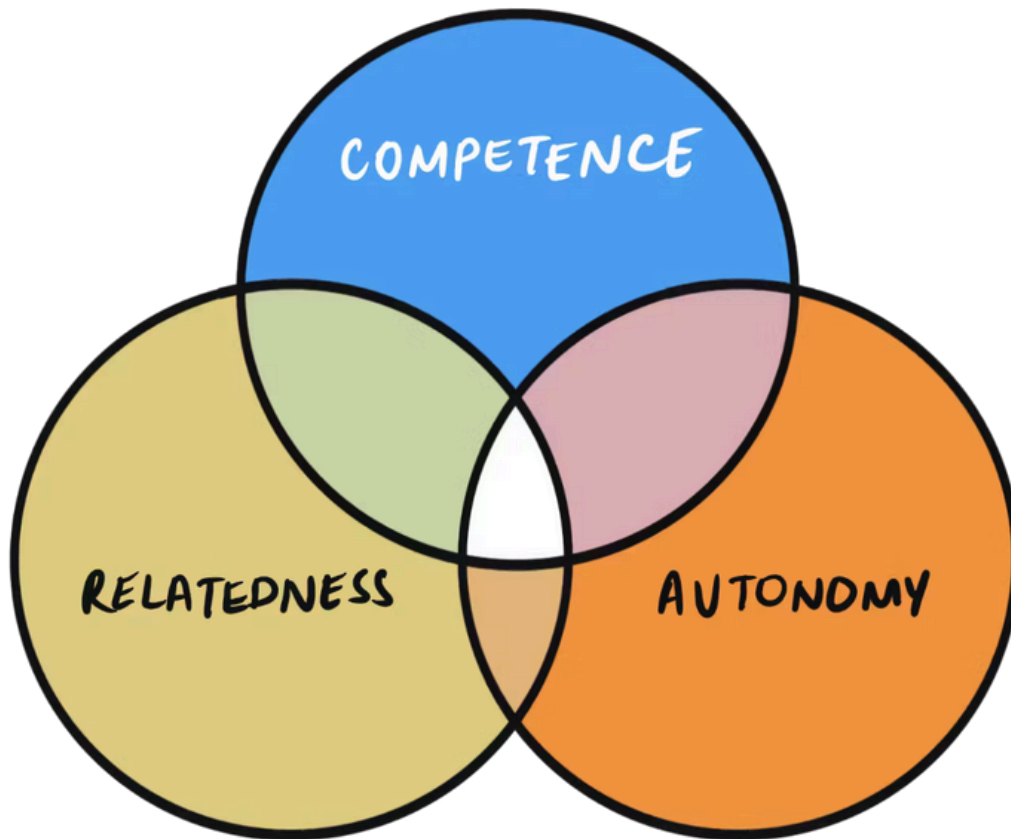
In traditional educational models the primary focus has been on delivering information, This includes transmitting facts, concepts, and skills from educator to learner. However, in the context of AI literacy and youth education particularly when working with disadvantaged or emotionally vulnerable groups, this approach is no longer sufficient. Emotional connection has emerged as a critical factor in determining whether learning is not only retained but actively engaged with. Rather than treating emotion as a secondary or motivational add-on, contemporary research positions emotional experience as a core driver of educational engagement (Yang & Rui, 2025).

AI-enhanced learning environments provide a unique lens through which this shift becomes visible. In a large-scale study of over 660 English as a Foreign Language (EFL) learners in China, Yang and Rui (2025) found that emotional well-being (particularly in relation to depression and anxiety) was the strongest predictor of engagement outcomes. The more emotionally supported and connected students felt in their learning environments, the more likely they were to participate and succeed. On the other hand, students experiencing negative emotional states, such as frustration, isolation, or fear of failure, were significantly less likely to engage, regardless of how well-structured the content was.

In an era where AI systems can personalise content, track learner behaviour, and even detect emotional cues, connection is no longer abstract or optional, it is measurable and essential. Effective AI learning tools go beyond delivering standardised content; they adapt in real-time to offer encouragement, and emotional regulation support, creating safe spaces for learners who may otherwise disengage. Tools such as Duolingo, Elsa Speak, and chatbot-based tutors not only correct grammar but also reinforce confidence and reduce performance anxiety through low-stakes repetition and privacy (Yang & Rui, 2025).

This emotional responsiveness becomes especially crucial for learners at risk of exclusion, such as NEET youth, language learners, or students with learning difficulties, who often face overlapping barriers to engagement. For these groups, emotional safety is a crucial precondition for participation. As such, the PES framework advocates a shift away from neutral delivery of content and toward emotionally intelligent learning design, where humor, visuals, and storytelling are not extras, but core tools for building connection, trust, and a sense of belonging in learning spaces.

Educational theory supports this move. Self-Determination Theory (SDT), for example, identifies emotional needs like relatedness and autonomy as fundamental to motivation and engagement. AI-enhanced platforms that personalise learning paths, simulate conversational interaction, or allow students to make choices within their tasks help meet these needs and create deeper emotional investment (Yang & Rui, 2025). Similarly, Engagement Theory holds that active learning occurs most effectively through meaningful interaction, something media tools can do when used intentionally and inclusively.



## Learning Example: How Does AI Make You Feel?

**Objective:** Foster emotional awareness and peer connection in AI-related learning

**Task:** Students reflect on a past interaction with an AI tool (e.g. chatbot, recommendation system, language app) and describe how it made them feel—curious, confused, frustrated, amused, etc. These reflections are posted anonymously to a shared board. Learners then cluster similar emotions and discuss patterns in how AI affects them emotionally.

**Setup:** Facilitator provides a prompt (e.g. "Think about the last time you used AI...") and a digital board. Students can write, draw, or use emojis.

**Tools:** Padlet or Jamboard

### 1.2 The Role of Emotion and Attention in Learning

In education, attention is often treated as a necessity for learning, however, what sustains attention and what drives learners to focus in the first place is profoundly shaped by emotion. Emotional experiences stimulate neurological processes that amplify attention and enhance long-term memory (Tyng et al., 2017). Emotions influence attention through activation of brain structures like the amygdala, which acts as a filter for emotionally salient stimuli. When a learner encounters emotionally charged content (whether it's humorous, frightening, or relatable) the brain prioritizes that information for processing. This emotional arousal triggers the release of neurotransmitters that strengthen working memory and retention (Tyng et al., 2017). In short, emotion doesn't just support learning, it actually drives it.

This effect is not limited to negative emotions like fear or stress. Positive emotions such as interest, curiosity, and amusement are especially powerful in educational settings. These emotions increase dopamine levels in the brain, leading to higher motivation and a greater likelihood of engaging with complex or abstract content, such as algorithmic bias or neural networks in AI curricula. Emotional arousal creates "cognitive hooks" that help learners stay focused and form meaningful associations.

For more vulnerable learners emotionally neutral or text-heavy instruction can lead to disengagement. Integrating emotional elements through humor, storytelling or visuals can anchor attention and make learning more inclusive. This approach aligns directly with PES principles: learners are seen not just as processors of information, but as emotional, social beings who need connection to stay engaged. AI education, with its abstract terminology and invisible processes, especially benefits from emotionally engaging media.

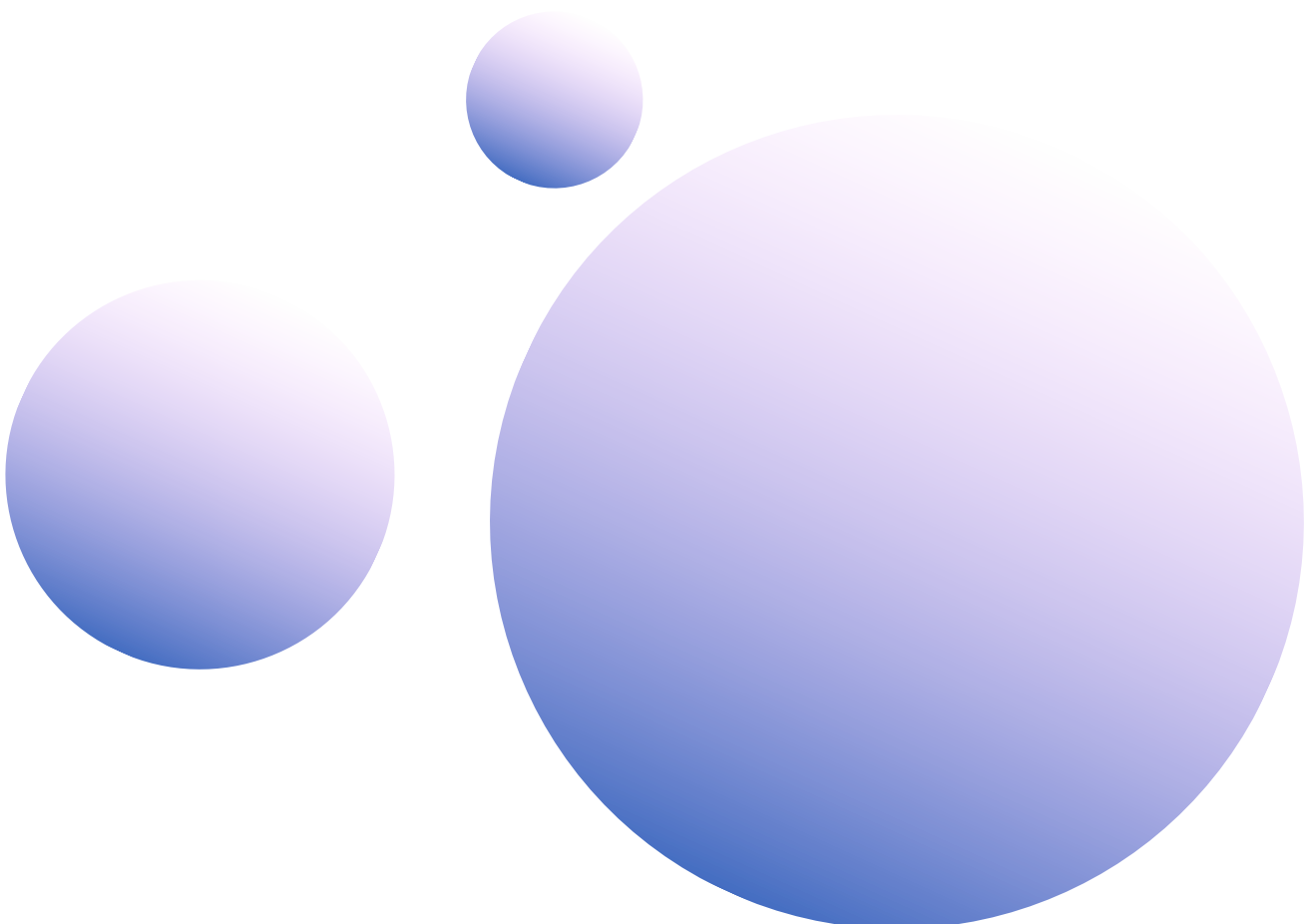
Whether it's using a relatable TikTok clip to introduce algorithmic personalization or a meme to spark curiosity about data ethics, emotion activates attention, and attention activates learning.

### Learning Example: Attention Grabbers in AI Lessons

**Objective:** Stimulate learner attention and emotional response at the start of a lesson

**Task:** The trainer begins a session with a surprising or funny AI-themed visual—e.g., a meme about ChatGPT writing love poems or a dystopian TikTok video about robots taking over the world. Learners briefly reflect in pairs: “What does this make you feel?” and “What question does this raise for you?” This primes emotional arousal and directs curiosity toward the session's topic.

**Tools:** Meme generator (e.g. Canva or imgflip), projector or digital board, short visual prompts



### 1.3 Aligning Engagement Strategies with Prompt Engineering Skills Principles

The development of Prompt Engineering Skills (PES) is not just the technical command of language models; it requires learning environments that support autonomy and active experimentation. In the case study by Mzwri and Turcsányi-Szabó (2024), the course I Learn with Prompt Engineering exemplifies how PES can be effectively supported through self-paced learning environments integrated with generative AI. The key to this alignment is the design of the course as a self-regulated learning (SRL) experience. Learners were encouraged to plan their progress, set their own goals, and engage in problem-solving processes that mirror the development of PES through independent and reflective practice (Mzwri & Turcsányi-Szabó, 2024). The course's structure, rooted in Education 4.0 principles and heutagogical theory, ensured that learners weren't just taught prompt patterns; they were challenged to apply and adapt them to real-world and academic contexts.

The integration of the EnSmart tool further supported PES development by providing immediate, automated feedback and personalised assessment. This allowed learners to refine their prompts based on results, receiving human-like guidance without the pressure of constant instructor intervention. Importantly, feedback was not limited to binary correctness but included detailed explanations that helped students understand the logic of effective prompts.

The survey results showed that the majority of participants reported significant improvement in their PES, furthermore, the course supported emotional engagement, an often under-acknowledged aspect of PES development. Students described increased motivation and curiosity, and reported that the immediate feedback and flexible structure allowed them to approach tasks without fear of failure. This aligns with the finding that emotionally safe environments enhance self-directed learning outcomes. Even the design of assignments (such as creating a mega-prompt or peer-reviewing others' prompts) fostered not just technical skill but participatory learning that is essential to mastering prompt engineering (Mzwri & Turcsányi-Szabó, 2024).

#### Learning Example: Prompt Pattern Exploration Lab

**Objective:** Deepen Prompt Engineering Skills through trial, error, and guided reflection

**Task:** Learners are introduced to three distinct prompt patterns (e.g. Persona, Chain of Thought, Flipped Interaction). In small groups, they design short prompts using each pattern and test their outputs in a live AI tool. They then compare results and discuss which techniques felt most intuitive, and which required more effort or adaptation.

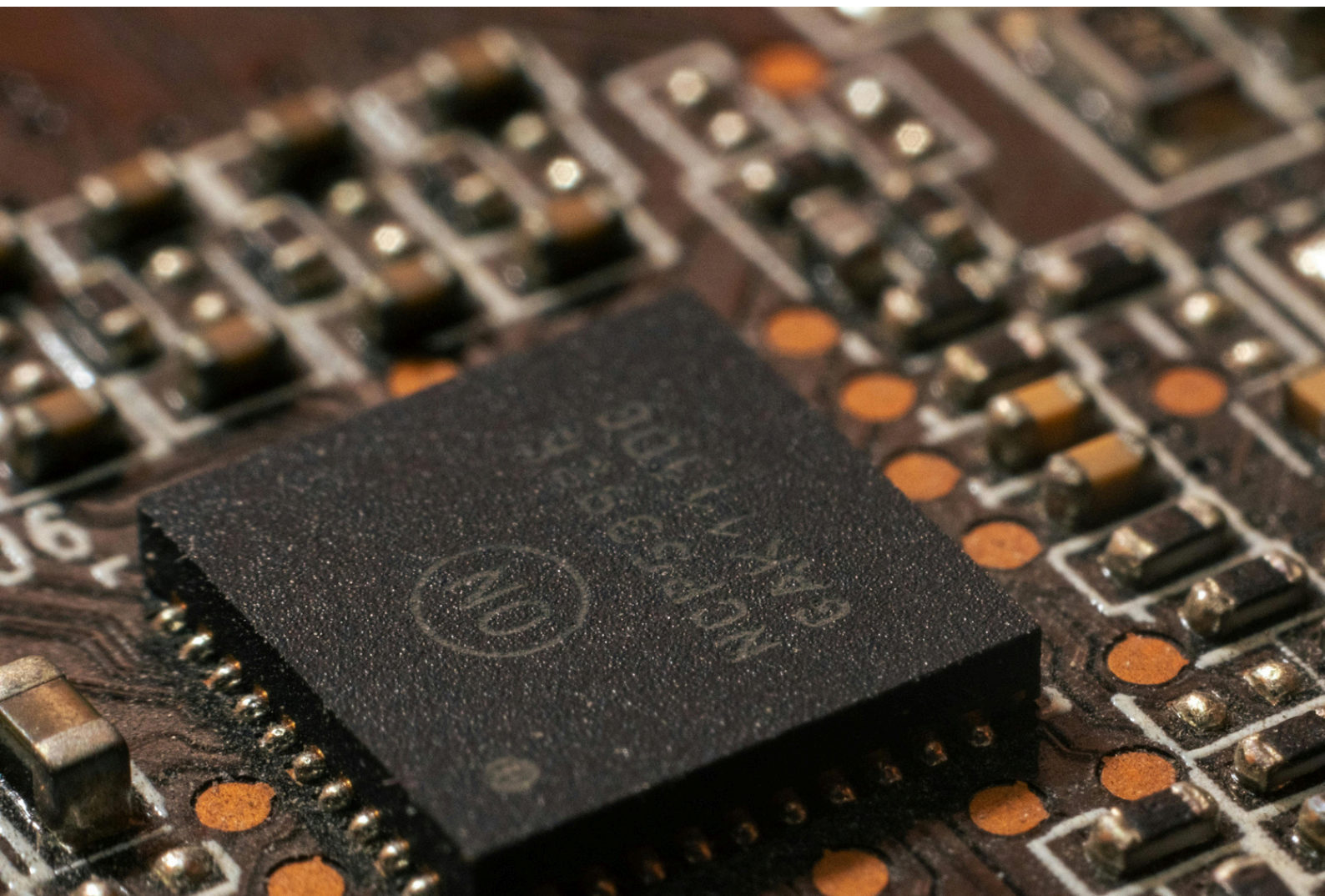
**Tools:** ChatGPT or EnSmart, shared doc for group reflections

## 1.4 Purpose of This Chapter

This chapter aims to equip educators, youth workers, and curriculum designers with practical tools and strategies to make AI education more engaging, accessible, and inclusive. While the topic of artificial intelligence can feel intimidating, the intentional use of storytelling, visuals, and humour can help learners connect emotionally and understand complex ideas.

In line with the PES principles, this chapter encourages participatory and ethical approaches by showing how media tools can empower diverse learners to take an active role in the learning process. From designing relatable case stories to creating AI-powered comics or memes, the methods introduced here promote creativity, critical thinking, and responsible engagement, especially for youth with fewer opportunities or learning barriers.

Each section of the chapter offers a blend of pedagogical insight, real-life classroom examples, and ready-to-use tools. The goal is not to prescribe a rigid method but to support experimentation, co-creation, and adaptation across different learning contexts. Ultimately, this chapter invites educators to view engagement not as entertainment, but as a powerful pathway to inclusion and deeper understanding in the age of AI.



## 2. Using Storytelling as a Core Pedagogical Strategy

### 2.1 Why Storytelling Works

Storytelling offers a powerful educational tool that supports student motivation, attention, and deep engagement. As Černý et al. (2023) argue, storytelling helps anchor abstract concepts in personally meaningful narratives, allowing students to make sense of complex topics through emotional and exploratory engagement. Their research, based on implementing nonlinear interactive stories (NIS) in Czech secondary schools, shows that storytelling is not just a method of content delivery but a form of active learning.

Students in the study responded positively to the NIS-based lessons, frequently describing them as enjoyable and effective for understanding the subject matter. Teachers noted that students appreciated the ability to make decisions, navigate plot branches, and reflect on the consequences of their choices: experiences that are rarely offered in traditional lessons (Černý et al., 2023). These elements of choice and agency directly enhanced attention and emotional investment, helping students stay focused and involved throughout the lesson.

Storytelling also supports inclusivity by accommodating diverse learning styles. Visual learners benefited from the multimodal design of the interactive stories, while reflective learners were drawn to character perspectives and branching paths. In short, storytelling works not because it simplifies content, but because it humanises it. As Černý et al. (2023) suggest, this method does not replace content; it transforms how learners connect with it.

#### Learning Example: Choose-Your-Own-Path Debate

**Objective:** Strengthen emotional engagement and critical thinking through interactive narrative exploration

**Task:** Learners are presented with a nonlinear interactive story (created using Twine or similar tools) simulating a public debate on an AI-related topic (e.g., facial recognition in schools). Each choice leads to different consequences and arguments. After completing the path, students reflect in small groups: Which decisions felt hardest? What new perspective did the story reveal?

**Tools:** Twine, Google Docs for reflection, Padlet or Jamboard for sharing outcomes

## 2.2 Formats: Case Narratives, Personal Stories, Fictional Scenarios

Within the Universal Design for Learning (UDL) framework, offering multiple means of engagement and expression is essential to accommodate the diverse emotional, cognitive, and cultural backgrounds of learners. Storytelling serves as a flexible pedagogical tool that aligns directly with these principles.

- **Case narratives** allow learners to engage with real-world situations and practice perspective-taking. By simulating authentic contexts, they support students in analysing challenges and formulating solutions relevant to their lived or future experiences.
- **Personal stories**, whether they are shared by facilitators or participants they promote emotional safety and connection. These narratives humanise complex concepts, reduce hierarchies, and encourage reflection, especially for learners who may feel excluded by abstract or technical content.
- **Fictional scenarios** enable creative freedom and safe exploration of sensitive or complex topics, such as ethics in AI or algorithmic bias. They offer a “low-stakes” space for learners to test ideas and co-construct meaning, in line with UDL’s emphasis on flexible learning paths and student autonomy.

These formats not only activate engagement but also provide differentiated pathways for learners to connect with the material, demonstrate understanding, and feel ownership over their learning process: a key requirement for inclusive and emotionally intelligent pedagogy (Priyadharsini & Mary, 2024).

## 2.3 Applying Storytelling to AI Topics (e.g., "A Day in the Life of an Algorithm")

Storytelling becomes most powerful when it is directly applied to complex topics like artificial intelligence, making abstract processes visible and emotionally engaging. Rather than explaining how algorithms or data work in the abstract, teachers can frame these concepts as stories that students enter, question, and even rewrite.

A practical example is the learning activity “A Day in the Life of an Algorithm.” In this task, students follow the imagined daily routine of a recommendation algorithm: waking up in a server, scanning a user’s online behaviour, selecting what content to prioritise, and dealing with ethical dilemmas (e.g., Should it show a violent video if it boosts engagement? Should it recommend ads based on personal health data?).

Each scene can include decision points that students must navigate in groups, encouraging discussion around bias, fairness, and agency. This method draws on the nonlinear interactive storytelling principles explored by Černý et al. (2023), where learners actively participate in the story, reflect on consequences, and personalise their journey through choice. By turning technical systems into characters or narrators, students better understand not only how AI systems function, but also how they impact real lives.

Another variation of this approach could involve co-creating stories with AI tools: students write a short narrative about an AI gone rogue (or helpful), then prompt a chatbot to extend the story. They can compare endings, analyse biases, and reflect on where human and machine logic diverge. This hands-on engagement supports PES (Prompt Engineering Skills) goals by blending narrative thinking with technical awareness and creative prompting

## **2.4 Tips for Facilitators: Crafting a Compelling Story**

Crafting a compelling story for AI education doesn't require teachers to be novelists. Storytelling helps translate abstract AI systems into experiences learners can connect with and question. As Černý et al. (2023) argue, nonlinear interactive stories allow students to navigate branching narratives and reflect on the consequences of their decisions: skills particularly relevant when exploring ethical issues in AI. Similarly, Priyadharsini and Mary (2024) highlight the importance of differentiated learning strategies, like narrative formats, to support inclusion and emotional engagement across diverse learning profiles.

Based on these insights, the following tips can support facilitators in building inclusive stories around AI topics:

### **Start with a relatable hook**

Anchor the story in familiar contexts like school, social media, or friendships. Stories that reflect learners' own experiences promote empathy and understanding, especially when introducing abstract topics like algorithms or data flow.

### **Introduce ethical tension or a guiding question**

A compelling story often includes a dilemma. Should a chatbot recommend mental health resources to a student without knowing their background? Should an algorithm prioritise engagement or well-being? These questions can stimulate reflection and align with PES (Prompt Engineering Skills) objectives.

**Offer branching choices or consequences**

Use interactive formats (e.g., Twine) or live classroom discussion to let learners make decisions that influence the story's direction. This increases emotional investment and mirrors the real-life unpredictability of AI systems (Černý et al., 2023).

**Encourage co-creation**

Give students space to write, prompt, or extend the story themselves. Co-creating stories with AI tools (like ChatGPT or StoryBird) develops PES while engaging the students' creativity in the learning process.

**Debrief with real-world reflection**

After completing the story, guide students to reflect: How did the AI behave? Was it fair? What data did it use?

Storytelling, when structured with purpose and play, transforms AI from a technical topic into a real experience. For teachers, it becomes a tool not only for inclusion but for deeper engagement.



## 3. Visuals and Infographics in the Prompt Engineering Skills (PES) Framework

### 3.1 Visuals as Cognitive Anchors

In today's classrooms, especially when teaching abstract topics like artificial intelligence, visual aids play a vital role in enhancing students' understanding and engagement. As Moses Alabi (2024) explains, visual learning strategies help to process complex information by allowing students to experience content through both visual and verbal channels. This dual engagement aids in comprehension and significantly improves memory retention.

Alabi (2024) highlights that visual materials such as infographics, diagrams, videos, and animated graphics help learners create mental images, making it easier to understand and organise new knowledge. One of the key benefits emphasised by him is that visual aids also increase learner motivation and confidence. For students who may feel overwhelmed by technical terms and abstract ideas, visuals act as scaffolds. They simplify complex processes and foster a more inclusive environment by catering to diverse learning styles (Alabi, 2024).

Within the PES (Prompt Engineering Skills) framework, visual anchors can be used to help students better understand how prompts interact with algorithms, or how data flows through AI systems. These visual tools don't just decorate a lesson; they reduce abstraction and open up access for all learners, especially those who benefit from visual or multimodal instruction.

### 3.2 Designing AI Concept Maps, Process Diagrams, and Timelines

When teaching AI concepts students need support in mentally organising information in a meaningful way. Mayer (2024) argues that well-designed visuals such as concept maps and process diagrams are essential for reducing cognitive load and promoting deeper understanding. According to the Cognitive Theory of Multimedia Learning (CTML), learners process information more effectively when it is presented through both verbal and visual channels, especially when those visuals reflect meaningful structural relationships (Mayer, 2024).

Concept maps are particularly powerful because they help learners identify and connect core ideas within a topic, such as how training data relates to algorithm outputs, or how prompt structure influences AI-generated responses. Diagrams of processes and timelines (e.g., showing the evolution of machine learning methods or steps in prompt engineering) enable students to form causal associations, therefore improving their retention.

Importantly, Mayer (2024) stresses that these visual formats are only effective when they follow certain design principles. These include spatial contiguity (placing text and visuals close together), signalling (highlighting key relationships or paths), and coherence (removing extraneous content). In practice, this means an AI process diagram should clearly label each stage of the data cycle, use arrows to indicate feedback loops, and avoid overwhelming learners with unnecessary details.

In the context of the PES framework, educators can use concept maps to help learners understand how prompts interact with large language models, or how training data, bias, and feedback shape algorithmic behaviour. Timelines might be used to explore key milestones in the development of generative AI, while process diagrams can break down how input is transformed into output through model layers.

### **3.3 Memes and GIFs: Leveraging Youth Culture for Conceptual Anchoring**

With younger or digitally immersed learners, humour and pop-cultural references can play an essential role in making abstract content more approachable. Memes and GIFs can in fact function as concepts that trigger emotional engagement and help ease points which would otherwise lead complex discussions.

According to Hayes and Fatima (2024), students in higher education responded positively to the use of emojis, memes, and GIFs in teaching, describing them as a “language we understand.” Their study revealed that learners viewed these visual media not as distractions, but as tools that helped them focus, connect emotionally, and better remember core concepts. Students appreciated when teachers integrated memes intentionally, saying they “broke up the seriousness” and made instructors feel more relatable (Hayes & Fatima, 2024).

From a Prompt Engineering Skills (PES) perspective, this emotional and cultural connection is instrumental. For example, a meme satirising AI-generated art or a GIF illustrating a chatbot’s awkward reply can open discussion on generative AI limitations, prompt effectiveness, or bias in training data

Hayes and Fatima (2024) caution, however, that intentionality matters. Visual humour should never be used arbitrarily or in ways that could alienate or distract. Instead, it should be tied directly to the learning objectives, creating moments of pause, laughter, or reflection that reinforce the conceptual content. When used with purpose, memes and GIFs become pedagogical tools that support confidence and critical thinking in AI education.

### Learning Example: Meme the Algorithm

**Objective:** Encourage emotional engagement and creative understanding of AI behaviour through relatable humour.

**Task:** Learners are asked to create or select a meme or short GIF that represents an aspect of AI behaviour or prompt response dynamics (e.g. hallucination, overly polite tone, over-correction). In small groups, they present their meme/GIF along with a short explanation:

What AI concept does it illustrate?

What misunderstanding does it reveal?

Why is this meme relatable to your experience of AI tools?

**Setup:** Facilitator provides example memes and a short demo (e.g. a meme about ChatGPT giving long-winded answers). Students can use meme generators (e.g. imgflip, Canva) or draw their own.

**Tools:** Laptops, meme generator apps, shared Padlet/Google Slides board for group sharing.

### 3.4 Using Comics and Illustrated Case Studies to Explain AI

Explaining AI concepts can be challenging due to the field's technical language; however, visual storytelling through comics offers a way to bridge this gap. Comics integrate imagery, narrative structure, and dialogue in a multimodal format that can support comprehension and motivation, particularly among students with diverse learning needs.

As Faria et al. (2024) demonstrate in their international study across European secondary schools, science comics have strong pedagogical value. Teachers noted that comics helped to simplify complex information without reducing its accuracy, while students found the format more engaging and accessible than traditional text-based materials. The visual context provided by comics made unfamiliar scientific terms more relatable and supported students' ability to visualise abstract concepts (Faria et al., 2024).

In the context of AI education, comics can illustrate processes such as training a model, detecting bias, or the consequences of poorly engineered prompts. Illustrated case studies can humanise ethical dilemmas by following fictional characters through AI-driven scenarios, such as a student interacting with a biased recommendation algorithm or a chatbot misunderstanding a user's intent. These stories make abstract content emotionally resonant and intellectually accessible.

Faria et al. (2024) also highlight the value of allowing students to co-create comics. When learners build their own illustrated narratives, they are encouraged to process the material actively, reflect on key ideas, and explain them in their own words. This aligns well with the PES framework's emphasis on inclusive, creative, and student-centred learning environments.

### Learning Example: "The Algorithm Did What?!"

**Objective:** Help students identify key AI concepts (like bias, hallucination, or data misuse) by designing short, illustrated case stories that are humorous, critical, and relatable.

**Activity Summary:** Students work in pairs or small groups to create a short comic (3–6 panels) featuring a fictional but realistic scenario involving AI. Their challenge is to:  
 Show something going wrong with the AI (e.g. misinterpreted input, ethical problem, glitch)  
 Explain what the underlying concept is (e.g. poor prompt, biased data)  
 End with a reflection or funny twist

**Example Topics:**

A student uses an AI chatbot to do their homework, but it invents fake citations

A job-matching AI refuses to recommend a woman for a STEM position

A character asks an image generator to draw a "normal family" and gets shocking results

**Tools:** Use Canva or Pixton



### 3.5 Free and Low-Code Tools: Canva, Piktochart, Genially, etc.

Creating visuals in AI education doesn't require advanced design skills or expensive software. A set of free and low-code tools such as Canva, Piktochart, Genially, and Infogram, make it possible for both educators and learners to build engaging content with even minimal technical skills. Jaleniauskiene and Kasperiuoienė (2022) found that when students were encouraged to create their own infographics using tools like Canva and Piktochart, they demonstrated improved information literacy and greater confidence in organising and presenting complex knowledge. These tools enabled learners to simplify abstract or data-heavy concepts, often turning text-based content into structured knowledge.

In the context of AI education, such tools are ideal for:

- Mapping the structure of an algorithm or data flow
- Creating prompt-response relationship visualisations
- Designing timelines for AI history or ethical debates
- Comparing model types or training data quality

Importantly, these platforms are not only useful for educators designing lesson content, they also allow students to become content creators. When learners make their own visuals, they are forced to reflect on what matters most and how to communicate it effectively. As the authors emphasise, such tools align well with the shift toward more student-centred, multimedia-enhanced pedagogy in digital education across European institutions (Jaleniauskiene & Kasperiuoienė, 2022). This makes them not just convenient, but strategically valuable for teaching complex topics like AI.

#### Learning Example: The AI Museum Poster Challenge

**Objective:** Encourage students to research and creatively present a key AI concept by designing a visual "exhibit poster" using low-code tools.

**Task:** Students work in small groups to create a digital poster that could belong in a fictional "AI Museum for Youth." Each group is assigned (or chooses) one concept (e.g. machine learning, training data, prompt engineering, hallucination, AI in daily life). The poster must:

- Explain the concept clearly using visuals, not just text
- Include a "Did You Know?" or "AI Mythbuster" fact box
- Be designed to engage a teenage audience (with humour, emojis, relatable images, etc.)
- After designing their poster in Canva, Piktochart, or Genially, the groups do a 2-minute pitch to the class as if they were curators unveiling their museum exhibit.

**Tools:** Canva, Piktochart, Genially (free versions work fine)

## 4. Humor as a Learning Strategy in Prompt Engineering Skills

### 4.1 How Humor Enhances Memory and Motivation

Humour is not just entertainment in education, it is a cognitive tool that enhances engagement, motivation, and memory. In the context of PES (Prompt Engineering Skills), where abstract thinking and linguistic experimentation are central, humour helps learners process complexity in a light, accessible way. Erdoğan and Çakıroğlu (2021) demonstrate that when humour is embedded intentionally into educational content, it increases student engagement across three domains: behavioural, emotional, and cognitive. Their study of 74 Turkish university students found that humour helped reduce stress, improve attention, and make challenging material more approachable in online settings. Learners described humorous tasks as more enjoyable and memorable, which directly supported sustained focus and deeper learning outcomes.

The key mechanism, according to the authors, lies in how humour creates emotional resonance. When learners laugh, their anxiety decreases and their brain becomes more receptive to new information. This is especially relevant in AI education, where learners may feel intimidated by technical language or unfamiliar systems. A well-timed meme, joke, or humorous prompt not only activates attention but also reduces fear of failure therefore making learners more willing to experiment. In PES-aligned classrooms, humour is not a distraction, it is a pedagogical amplifier. Whether embedded in the content (e.g., a funny prompt) or used spontaneously by the facilitator, humour signals safety, creativity, and cognitive flexibility which are all essential for effective prompt engineering and AI literacy.



## 4.2 Types of Humor in Learning (Satire, Parody, Absurdity)

Humour enhances learning not only by making lessons more enjoyable, but also by activating deeper emotional and cognitive engagement when used in diverse formats. Bakar and Kumar (2023) show that students strongly associate humour with comfort and emotional connection, especially when teachers use it meaningfully and appropriately within lessons. Drawing from their qualitative analysis, different humour types contribute in distinct ways:

**Satire** plays a subtle yet powerful role in critical learning. While Bakar and Kumar (2023) focus primarily on relational and spontaneous humour, their participants noted that when humour gently challenged assumptions or highlighted contradictions, it provoked thought. In PES contexts, satirical examples (like a mock AI prompt that reinforces harmful stereotypes) can stimulate discussions around ethics and bias in algorithm design.

**Parody**, or the humorous imitation of styles or formats, makes abstract or unfamiliar content more relatable. When learners encounter a playful replica of, for example, a chatbot Q&A gone wrong or a reimagined AI terms-of-service, it lowers formality and encourages experimentation. As students in Bakar and Kumar's (2023) study highlighted, such approaches helped "break the ice" and made "serious content feel lighter without losing meaning."

**Absurdity**, often overlooked in formal education, emerged implicitly in the study through students' appreciation for humour that was "random," "unexpected," or "a little silly." This aligns closely with PES strategies that reward flexible and creative thinking. When learners see teachers embrace nonsensical prompts or illogical outputs from AI tools, it gives them permission to take risks, laugh at mistakes, and explore without fear of failure.

Together, these types of humour contribute to what the authors call "a relaxed learning atmosphere", which enhances motivation and trust between teacher and learner.



### 4.3 Activities (e.g. Create-A-Meme Challenge)

To wrap up the humour section, this activity turns theory into practice. By creating their own AI-themed memes, learners apply humour intentionally while engaging with core PES topics. The task reinforces creative personal expression and conceptual clarity, without the pressure of formal assessment.

**Objective:** Use humour and digital creativity to deepen understanding of AI-related topics while fostering engagement, emotional connection, and peer collaboration.

**Activity Overview:** In this challenge, learners create memes that reflect, critique, or creatively explore a topic related to artificial intelligence or prompt engineering. The goal is not just to make people laugh, but to use humour as a lens for critical reflection and personal expression.

#### Steps:

1. Topic Selection: The facilitator provides 3-5 AI-related themes or dilemmas (e.g., algorithmic bias, ChatGPT hallucinations, surveillance tech, data privacy, etc.). Learners choose one that interests them.
2. Humour Style Pick: Learners are encouraged to consider different humour styles (satire, parody, absurdity) based on previous lessons or examples. They choose one style to shape their meme.
3. Meme Creation: Using free tools like Canva, imgflip, or even Google Slides, learners design a meme that expresses a viewpoint, question, or observation about the chosen topic. They can draw from personal experience, class content, or current events.
4. Sharing & Feedback: Memes are shared on a communal platform (Padlet, Jamboard, or a printed wall). Each learner or group briefly presents: What the meme is about, What humour style they used, What they want viewers to take away
5. Reflection The class discusses - Which memes were most memorable, and why? What are the risks or limits of using humour in serious topics?

**Tools & Platforms:** Meme generators (Canva, imgflip, Kapwing). Sharing space (Padlet, Jamboard, Google Slides)

## 5. Designing Engaging Multi-Modal Learning Experiences

### 5.1 Blending Media: Audio + Visual + Interactivity

Teaching AI effectively requires layered experiences using different media. Recent research shows that combining audio, visuals, and interactivity not only enhances comprehension but also supports emotional connection. In a global bibliometric study of multimodal teaching practices (1995-2023), Guo et al. (2024) identified a significant shift: Since 2016, multimodal pedagogies have surged, particularly in contexts using interactive media, video conferencing, and multimedia human-computer interfaces. The authors argue that multimodal teaching isn't a luxury, it's essential for meeting changing learner needs in a digital world.

Why does blending matter? Each medium offers unique "semiotic affordances":

- Audio provides narrative voice, tone, clarity, and emotion.
- Visuals (images, charts, animations) support pattern recognition and contextualization.
- Interactive elements (quizzes, simulations, decision trees) invite active inquiry and deepen understanding.

In AI education, this could mean:

- Listening to a short podcast or narrated story about a chatbot experience,
- Viewing an infographic that maps how neural networks process data,
- Exploring an interactive decision tool that visualizes how prompt tweaking affects output.

Such layered experiences align with the PES framework, encouraging learners to engage emotionally, experiment with ideas, and create content themselves, all vital for prompt engineering skills and AI literacy.

Importantly, Guo et al. (2024) emphasize that multimodal approaches improve equity and accessibility. Learners with different needs (language learners, neurodivergent students, or those unfamiliar with AI) benefit from having multiple pathways to engage and succeed.



## 5.2 Adding Sound Effects and Music for Impact (e.g., podcast episodes)

Incorporating sound, whether music, ambient effects, or narrative voice, can significantly enhance learners' engagement with complex topics like AI. Podcasts and other audio-based tools are particularly powerful when used not just for content delivery, but as immersive, emotionally engaging learning experiences.

Araújo and Rodrigues (2019) conducted a systematic review of podcast learning effectiveness in higher education across Europe. Their findings showed that podcasts consistently supported improved learning outcomes, especially when they were well-structured and thoughtfully produced. Students reported that background music, clear voice pacing, and creative sound elements reinforced content and allowed for more flexible and personalised engagement with the material.

Importantly, these sound elements weren't just "add-ons", they contributed to how learners interpreted, remembered, and emotionally connected to content. When integrated with the PES (Prompt Engineering Skills) framework, podcasting and sound design allow students to engage with abstract concepts like data ethics or algorithmic bias in more memorable, narrative-rich formats. Adding music to signal section changes or emotional tone, or using ambient effects in a roleplay scenario, gives depth to lessons that may otherwise feel technical or detached.

Araújo and Rodrigues (2019) conclude that podcasting supports inclusive, learner-centred environments, especially valuable for students who benefit from self-paced learning or alternative modalities beyond traditional texts and visuals.

### Learning Activity: "Design Your AI Podcast Clip"

**Objective:** Encourage learners to explore a complex AI topic (e.g., algorithmic bias, prompt engineering, data privacy) by scripting and producing a short podcast segment, using sound design to enhance emotional engagement and retention.

**Task:** Learners work in pairs or small groups to script and record a 2-3 minute podcast clip.

**They must:**

Explain a chosen AI topic in an accessible, engaging way; Use at least one sound effect (e.g., typing, voice modulator, background noise) and one music cue (e.g., intro or transition music); Consider the emotional tone they want to evoke (serious, curious, playful) and use sound to support it.

**Setup & Tools:** Audio editing tools - Audacity (free), GarageBand, or online platforms like Soundtrap or Anchor, Optional - Headphones and microphones (basic phone mics also fine). Teacher provides a few examples of good podcast structure (intro-content-outro), perhaps using existing AI education podcasts for inspiration.

### 5.3 Digital Tools for Creating Learner-Centered Content

Learner-centred education thrives when students are given the tools to design, experiment, and express themselves actively. Instead of passively consuming content, learners can use digital tools to build their own knowledge through creation, aligning directly with the goals of the PES framework.

In their study on the use of Jupyter Notebooks and R Shiny applications, Hanč, Štrauch, and Paňková (2020) show how these tools empower students to explore data interactively, visualise complex processes, and construct personalised educational experiences. Originally used in university-level data science courses, these platforms are also increasingly relevant in secondary and vocational education, especially where topics like AI, statistics, or digital ethics are involved.

Jupyter, for instance, enables learners to combine narrative, code, and visual output in one place therefore allowing for multimodal experimentation and iterative learning. R Shiny applications go a step further, enabling students to create dynamic, web-based visualisations and simulations. Teachers in the study reported that students became more engaged when they had the freedom to adjust parameters, test their own hypotheses, and see immediate results. This type of agency turns abstract AI topics into hands-on knowledge.

In PES-aligned classrooms, tools like Jupyter and R Shiny can help students co-construct knowledge while developing both digital and critical thinking skills. They also foster a shift in classroom roles: from content receivers to creators, and from guided instruction to collaborative exploration.



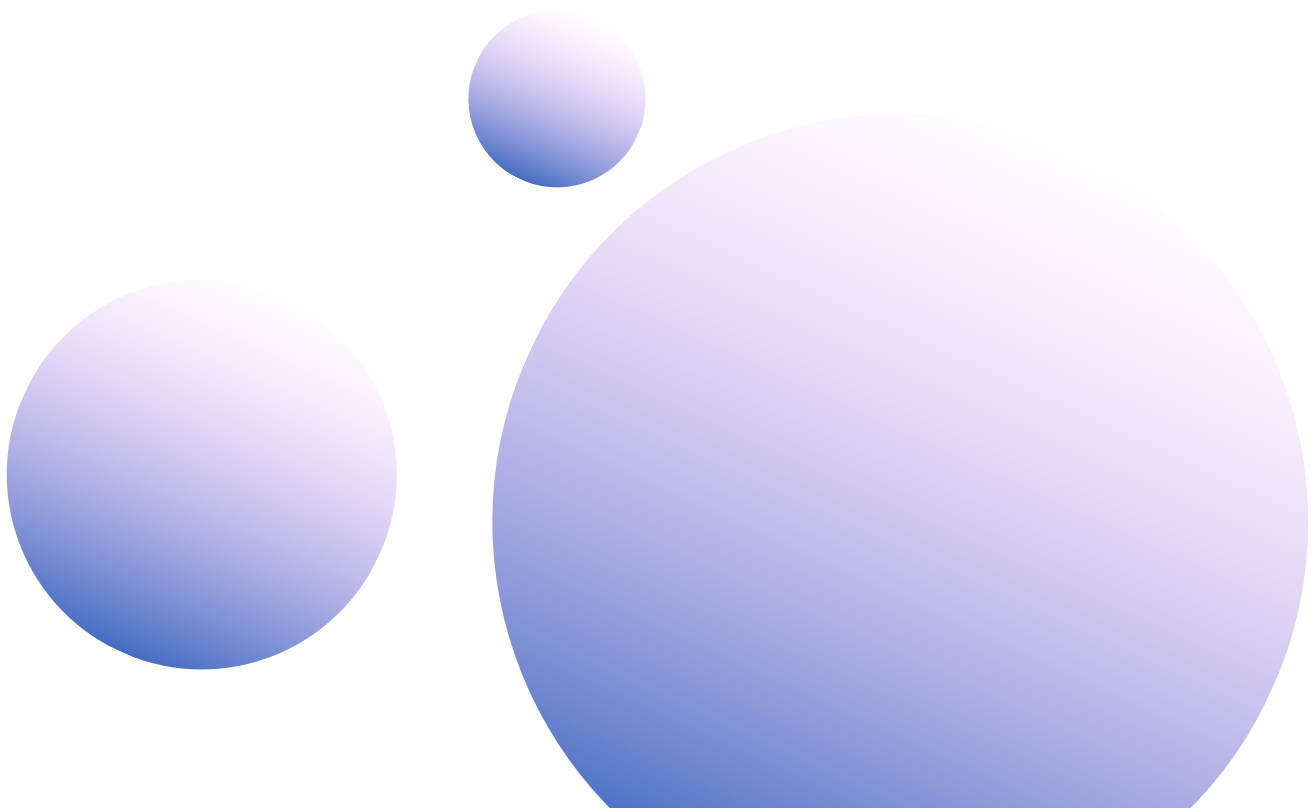
## 6. Media for Inclusion: Culturally Responsive and Accessible Design

### 6.1 Using Local Contexts and Humor for Relatability

Creating truly inclusive learning environments requires educators to also tap into the cultural and emotional realities of their students. According to Muna (2024), culturally responsive teaching is most effective when it draws directly from students' lived experiences, language patterns, and everyday cultural references. This includes not only serious cultural narratives but also local humour, slang, and familiar scenarios that build a sense of recognition and trust.

Using humour rooted in local expressions, common school or neighbourhood experiences, or regional media makes content feel immediate and belonging. When students see their world reflected they feel more respected, understood, and emotionally engaged. Muna (2024) emphasizes that these strategies are particularly impactful for learners from minority or marginalised backgrounds, who often feel excluded from generic or "standardised" educational content.

For educators working with AI-related topics, this means designing examples, memes, or metaphors that reflect familiar touchpoints, such as a local celebrity appearing in a chatbot conversation, or a meme that references a typical classroom scenario. Importantly, humour must remain inclusive and respectful, reinforcing dignity and empathy rather than stereotypes. This approach also aligns with Universal Design for Learning (UDL) and PES principles, where emotional engagement, cultural accessibility, and learner agency are central.



## 7. Conclusion and Recommendations

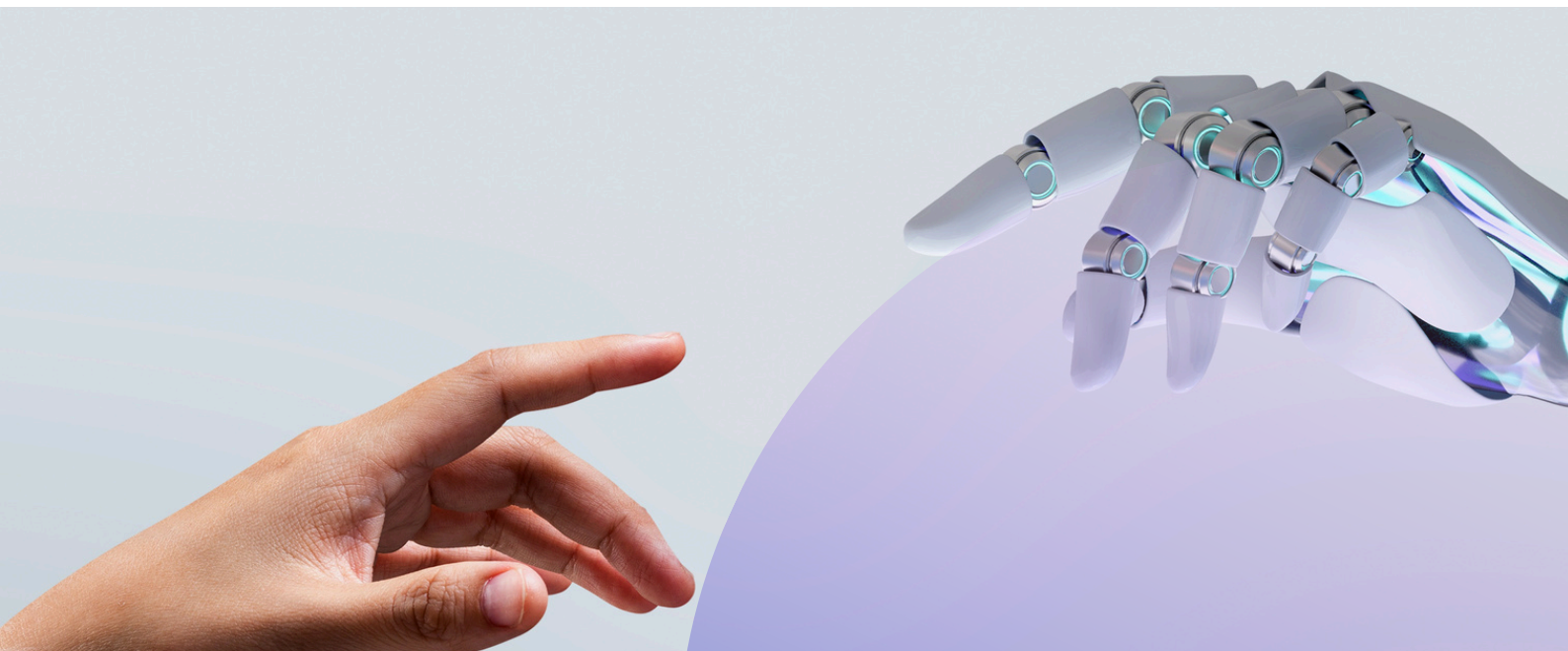
### 7.1 Key Takeaways

This guide has explored how humor, visuals, and storytelling function not only as engaging extras, but as core tools for inclusive, emotionally intelligent AI education. When applied intentionally, these tools help learners grasp abstract concepts, develop critical thinking, and connect AI topics to their own lives. In the context of Prompt Engineering Skills (PES), they offer practical ways to build confidence, creativity, and reflection, especially for students who may feel excluded from traditional or technical learning environments.

Key insights include:

- Storytelling creates narrative structures that allow students to explore ethical dilemmas, agency, and decision-making in AI (e.g., through “Choose-Your-Own-Path” debates or algorithm life stories).
- Visuals from concept maps and comics to memes and infographics, help reduce abstraction, clarify complex systems, and support memory and attention, especially when co-created by learners.
- Humor enhances emotional safety and motivation. Satire, parody, and absurdity can all be used to invite critical thinking, especially around AI's limitations and social implications.
- Multimodal combinations (e.g., podcasting with sound effects, interactive slides, or AI-generated comics) provide layered, personalised learning experiences that appeal to diverse learners.

Together, these tools support inclusive, learner-centred education that aligns with PES goals and fosters both technical skill and emotional connection.



## 7.2 Final Tips for Using Humor, Visuals, and Storytelling Responsibly

To get the most out of these tools, and to avoid potential pitfalls, educators and facilitators should follow these key principles:

- **Humor:** Use humor that is inclusive, purpose-driven, and sensitive to the group. Memes, playful prompts, or comic twists should be tied to clear learning objectives and never rely on stereotypes or mockery. Encourage students to choose their own humour styles to reflect how they relate to AI topics.
- **Visuals:** Keep them meaningful, not decorative. Use diagrams, timelines, and comics to show relationships, processes, and decision points. Prioritise accessibility by choosing clear, readable designs and providing alternative text where needed. Free tools like Canva, Genially, and Piktochart make this easy even without design experience.
- **Storytelling:** Anchor stories in relatable contexts. Whether creating fictional characters navigating algorithmic bias or scripting an AI podcast, stories should include moments of choice, reflection, and emotional engagement. Encourage co-creation: let learners design their own narratives, endings, and dilemmas.
- **Tool Integration:** Choose tools that allow students to build, not just consume. Jupyter, Twine, and meme generators can be used to explore content helping students with experimentation and creativity. Podcasts, AI chat interfaces, and comics offer space for youth to express voice and style.

## 7.3 Invitation for Experimentation and Youth Co-Creation

This guide is not a recipe book, it's a launchpad. The real power of these tools lies not in how perfectly they are delivered by educators, but in how freely they are picked up, adapted, and expanded by learners themselves. Co-creation is at the heart of inclusive AI learning. It invites young people to bring their voices, humour, aesthetics, and questions into the learning process. Let students remix memes to explain algorithmic bias, design their own AI podcast episodes, or build comics that reflect real dilemmas in their digital lives. Let them fail safely, laugh openly, and explore AI not as passive consumers but as ethical participants. In the spirit of PES and inclusive pedagogy, we invite educators and youth workers to step into the role of facilitators, not just instructors, and to trust that engagement, when nurtured with care, leads to understanding, agency, and innovation.

## Part 4.

# Tips on customizing for framework for different youth groups, ensuring inclusivity and relevance

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This section of the Prompt Engineering Skills Framework focuses on differentiation, contextual adaptation, and inclusive pedagogical design to meet the needs of diverse youth populations in AI and digital literacy education.

# 1. Introduction: Why Customization Matters in Prompt Engineering Skills

## Equity, Access, and Opportunity in the Digital Era

Artificial Intelligence (AI) is no longer an emerging trend; it has become a core competency in today's entrepreneurial and employment landscape. The World Economic Forum (2023) identifies AI and digital literacy as among the most critical skills for the future. According to employer projections for the next five years, technological skills are expected to surpass all other skill categories in importance. AI and "big data" top the list as the fastest-growing competencies, followed closely by networks, cybersecurity, and general technological literacy. This shift underscores the urgent need to integrate AI-related education, such as prompt engineering, into youth training and employability strategies.

### 1.1 Barriers faced by marginalized groups in acquiring these skills

Recent developments in artificial intelligence (AI) have intensified global interest in its potential to transform education. As with previous waves of technological innovation, AI brings both promise and risk. Historically, technological advancements have often reinforced existing social inequalities by primarily benefiting already-privileged populations.

One of the most pressing issues in this regard is the persistent gender gap in digital access, particularly in developing regions. Cultural norms, traditional gender roles, and unequal distribution of resources continue to limit women's and girls' access to technology. The GSMA Mobile Gender Gap Report (2022) reveals that women in low- and middle-income countries are 16% less likely than men to use mobile internet, a disparity that significantly restricts their participation in education, employment, and civic life within the digital economy.

Beyond gender, systemic barriers also affect marginalized ethnic and linguistic communities, who often face exclusion from mainstream education systems. This lack of access to foundational education hinders their ability to acquire digital skills and engage meaningfully with emerging technologies like AI. Language emerges as a critical dimension of digital inclusion: much of the internet's content is available only in dominant global languages, especially English. In linguistically diverse countries, the absence of localized content and user interfaces further entrenches digital marginalization, leaving non-English-speaking communities at a distinct disadvantage (Crawford & Evans).

## 1.2 Youth-Centered Design as a Principle of Inclusive Prompt Engineering Skills

Creating inclusive approaches to teaching Prompt Engineering Skills (PES) begins with placing young people at the center of the educational process. A youth-centered design framework emphasizes the importance of engaging learners as active contributors rather than passive participants. This means shaping educational content and delivery methods based on young people's experiences, interests, needs, and cultural backgrounds.

In the context of AI and prompt engineering, this approach becomes particularly valuable. These skills require critical thinking, creativity, and contextual understanding—all of which are best supported in environments that empower learners. When young people are involved in shaping how they learn, the educational process becomes more relevant and motivating. For example, using familiar digital tools, integrating youth-led examples, or encouraging learners to develop prompts based on real-life challenges enhances both engagement and skill acquisition.

Furthermore, a youth-centered approach helps address educational inequities. Young people from disadvantaged groups such as NEET youth, migrants, or those in rural areas often lack access to traditional educational systems or are disengaged due to prior negative experiences. By involving them in co-creating materials, adapting language, and ensuring flexibility in delivery, educators can design PES learning experiences that are truly inclusive and responsive.

Youth-centered education not only promotes equity but also fosters deeper learning and long-term empowerment. It builds the confidence of young people to explore new technologies, express their creativity, and become active contributors to the digital future.



### 1.3 Structure and Aim of This Chapter

Effectively supporting and empowering young people requires educational approaches that are specifically tailored to their diverse needs. Achieving this begins with accurately identifying the target groups involved. A clear understanding of your audience is essential for designing relevant, inclusive, and impactful guidance. When educational efforts are aligned with the realities and backgrounds of different youth subgroups, learners are more likely to engage, adapt, and benefit from the experience.

This chapter is designed to help educators, youth workers, and program designers recognize the diversity within youth populations and to guide them in customizing PES (Prompt Engineering Skills) education accordingly. It outlines practical strategies, adaptation methods, and inclusive design tools that can be used to create meaningful learning outcomes for various marginalized or underrepresented groups. The aim is to ensure that all young people, not just those with existing access or privilege, can participate fully in AI education and benefit from its opportunities.



## 2. Youth Diversity in Educational Contexts

### 2.1 Youth as a Heterogeneous Group

**Key Categories:** Gender, Ethnicity and Language, Urban vs. Rural Settings, Migrants, Refugees, and Stateless Youth, LGBTQIA+ Youth, Youth with Disabilities, NEET (Not in Education, Employment, or Training) Youth

Young people are not a monolithic group; they represent a wide range of social, cultural, economic, and personal backgrounds. Understanding these differences is crucial when designing and delivering PES (Prompt Engineering Skills) education. Inclusive learning requires recognizing and addressing the distinct challenges and barriers that affect how different youth populations engage with digital technologies, especially in fields like AI. Below are key categories of youth diversity that must be considered to ensure that PES frameworks are accessible, relevant, and empowering for all learners.

#### Girls and Young Women.

Despite the growing importance of digital skills, gender inequalities persist in technology education and digital access. In many communities, particularly in low- and middle-income countries, girls and young women face limited access to digital tools due to societal norms, family expectations, or safety concerns. Gender stereotypes portraying tech as a “male domain” discourage girls from participating in AI or STEM-related education, and the lack of visible female role models in the field reinforces this perception.

To promote equity, PES training must include gender-sensitive curricula that challenge stereotypes and showcase diverse examples of female success in AI. Designing activities around topics that resonate with girls’ interests, creating mentorship opportunities with women in tech, and ensuring safe, inclusive learning environments are essential for improving engagement.

### **Ethnic and Linguistic Minorities.**

Youth from ethnic or linguistic minority backgrounds often experience exclusion from mainstream education systems. Language is a fundamental barrier in AI-related learning; most tools, interfaces, and educational content are in dominant global languages like English, which can alienate learners who speak local or indigenous languages.

For PES education to be effective, it should include multilingual support and localized content. Translating materials, integrating culturally relevant examples, and using visual or audio aids can make prompt engineering more accessible to linguistically diverse learners. Involving community members or peer translators can also enhance cultural relevance and learner confidence.

### **Urban vs. Rural Youth.**

While urban youth may have greater exposure to digital tools, infrastructure in rural areas often lags behind. Youth in remote regions may lack reliable internet access, up-to-date devices, or local training centers. This digital divide makes it difficult for rural learners to participate in AI education, especially in formats that require online interaction or cloud-based tools.

Inclusive PES delivery must take these disparities into account by offering offline or low-tech alternatives, hybrid training models, and localized outreach. Using mobile-friendly tools, developing printable activities, and incorporating community-based teaching can help bridge this gap.

### **Migrant, Refugee, and Stateless Youth.**

Migrant and refugee youth often navigate a complex set of challenges, including disrupted education, legal insecurity, trauma, and language barriers. Their exposure to formal education may be inconsistent, and psychosocial stress can impact their ability to focus and learn. Stateless youth face added difficulties in accessing digital infrastructure or formal training due to documentation or policy restrictions.

Incorporating trauma-informed and flexible teaching practices into PES frameworks is critical. Learning should be scaffolded with extra language support, visual storytelling tools, and culturally inclusive content. Providing psychosocial support, safe learning spaces, and pathways for recognition of prior learning can further improve access.

### **LGBTQIA+ Youth.**

LGBTQIA+ youth frequently face exclusion, discrimination, or invisibility in educational environments, particularly in conservative settings. These factors impact their psychological safety and participation. In the digital sphere, concerns around online harassment and a lack of inclusive content can also discourage engagement with AI tools.

To ensure inclusivity, PES content should reflect diversity in identities and use inclusive language and examples. Facilitators must be trained to create safe, non-judgmental learning spaces where LGBTQIA+ youth feel respected and affirmed. Encouraging the use of chosen names and pronouns and integrating queer-positive role models in AI/STEM can further boost engagement.

### **Youth with Disabilities.**

Young people with disabilities face both physical and systemic barriers in digital education. Many AI tools and platforms are not accessible by design; for example, screen readers may not interpret certain visual interfaces, and cognitive overload can make complex tools difficult to navigate. In-person learning environments may also lack physical accommodations or accessible teaching materials.

Applying the Universal Design for Learning (UDL) model in PES ensures that education is flexible, multisensory, and responsive to diverse needs. This includes offering content in multiple formats (text, audio, video), using assistive technologies, and providing clear, consistent instructions. Adaptive pacing and sensory-sensitive design features can also enhance inclusion.

### **NEET (Not in Education, Employment, or Training) Youth.**

NEET youth often face compounding barriers: low income, lack of formal education, mental health challenges, or disconnection from social support systems. Many have experienced failure or disengagement in traditional education, which affects their motivation and self-confidence. Additionally, they may be unaware of the value of digital skills like prompt engineering or how it connects to real-life opportunities.

PES education for NEET youth should prioritize relevance and empowerment. Using relatable examples, gamification, peer mentorship, and hands-on, low-pressure activities can foster re-engagement. Training should also clearly link PES skills to real-world applications such as job readiness, entrepreneurship, or digital content creation.

### 3. Framework for Customizing Prompt Engineering Skills

The initial step in developing inclusive and adaptable Prompt Engineering Skills (PES) education is recognizing that various learners have different backgrounds. Core, non-negotiable components must be balanced with variable components that can be tailored to local needs, learning contexts, and youth profiles in a well-designed framework. This chapter describes the practical, accessible, and context-sensitive approaches that educators and youth workers could use to adapt their implementation of PES.

#### 3.1 Core vs. Flexible Elements of the Framework

Two fundamental elements comprise a successful PES curriculum: the core and the flexible. All instructional settings should adhere to the fundamental concepts represented by the core elements. Understanding artificial intelligence and its principles, basic digital and data literacy, and most importantly, the principles of prompt engineering, how to create, test, and improve prompts to generate ethical and meaningful responses using tools like ChatGPT, DALL·E, Midjourney, and others. Ethical use of AI is also non-negotiable and must be embedded throughout, including topics such as bias, misinformation, and responsible data use.

On the other hand, PES education is adaptable to various learner groups due to its modular components. These include thematic examples (e.g., job-related prompts for NEET youth and storytelling prompts for refugee youth), the delivery method (online, in-person, or hybrid), the duration and pace of sessions, the language of instruction, and even the presence of peer support structures or mentors. Adjusting these elements ensures that learning remains engaging and relevant regardless of the setting or the learner's background.



### 3.2 Needs Assessment Methods

Identifying the learners' needs and interests is essential before customizing any PES education. To do this, it's important to intentionally participate in and gather input from the youth you aim to serve.

Focus groups and surveys are effective methods for determining general preferences, proficiency levels, and participation challenges. To discover more about local youths' daily routines, access to technology, and ambitions, it can be complemented by one-on-one interviews or informal discussions.

An additional level of relevance can be added by collaborating with young advisory groups. These groups can assist with content testing, provide models from real life, and assist facilitators on linguistic and cultural preferences.

Furthermore, it is crucial to perform a basic assessment of digital readiness. This could involve determining that learners have stable internet access, whether they are familiar with computers or smartphones, as well as how confident they are with AI-powered tools. Facilitators can manage material delivery effectively in ways that do not require access or prior knowledge by being informed in advance.

### 3.3 Adapting Language, Tone, and Cultural Framing

Employing language and tone appropriately is one of the best strategies for ensuring PES is inclusive. As many AI-related concepts are technical by nature, learners with no prior digital knowledge may find it overwhelming or confusing. Given this, it's crucial to avoid technical terminology and jargon and explain vital concepts using common language and familiar analogies.

Learning materials and interfaces for use have to be localized or translated into the learner's language. It encompasses not just written material but also spoken instructions, visual cues, and defining on the user interface. In multicultural or multilingual environments, this step could make the difference between alienation and inclusion.



Cultural framing carries equivalent importance. Locally relevant examples, such as neighborhood lingo, community concerns, or current trends like TikTok challenges, local festivals, or sports teams, could assist learners in making the connection between the abstract logic of prompt engineering to something important to their own lives.

## 4. Designing for Specific Youth Groups

No single strategy is effective for all young people. Every group contributes a distinct set of challenges, abilities, and experiences to the learning environment. Customizing the material and delivery style is crucial while teaching Prompt Engineering Skills (PES). This chapter offers particular methods for modifying PES training to fit the requirements of various young populations. Making sure that everyone can engage in AI education in a meaningful and self-assured way, regardless of gender, background, or ability.

### 4.1 Girls and Young Women

- Gender-sensitive AI curriculum examples
- Breaking stereotypes in tech learning
- Role model sessions and mentorship formats

Social and cultural challenges frequently prevent girls and young women from participating fully in STEM education and technology. These obstacles include restricted access to digital technologies, gendered expectations, and a lack of representation.

What to do:

- Incorporate examples in your lessons that are gender-sensitive. For example, prompts can address issues that relate to their interests, such as social justice, health fairness, or women in leadership.
- By presenting female professionals in AI, data science, or digital art, you can dispel tech prejudices. Case studies, guest speakers, or brief videos could be used for this.
- Provide mentorship and role modeling opportunities, particularly by matching students with women in technology or inviting female facilitators. One of the most potent motivators in a digital career is seeing someone "like them."

## 4.2 Rural Youth

- Low-tech, offline, or hybrid solutions
- Local language integration and community role models

Rural youth frequently struggle with infrastructure-related difficulties, such as poor access to the internet, limited educational possibilities, and a lack of exposure to digital literacy.

What to do:

- Provide offline or low-tech options. Accessibility can be improved by phone-based materials, printable worksheets, and interactive exercises like writing prompts on paper prior to converting them digitally.
- Make use of regional terminology, dialect, and analogies in conversations and example prompts. This improves understanding and strengthens connections.
- To increase confidence and relevance in delivery, include community members as co-facilitators, such as local educators, librarians, or youth leaders.

## 4.3 Migrant and Refugee Youth

- Language scaffolding and trauma-informed practices
- Using storytelling and media to bridge cultural narratives

Youth who are migrants, refugees, or stateless may find it difficult to fully participate due to psychological stress, mobility, and interrupted schooling. They might also struggle with language and be unaccustomed to formal educational settings.

What to do:

- To facilitate comprehension, utilize language scaffolding strategies such as visuals, subtitles, and detailed instructions.
- Adopt trauma-informed practices, like setting clear expectations, avoiding high-pressure activities, and promoting safety and choice in participation.
- Utilize the use of digital media and narrative. Refugee young people can employ story-based prompts to creatively explore identity, migration experiences, or future aspirations.

## 4.4 Youth with Disabilities

- Universal Design for Learning (UDL) in AI instruction
- Assistive technology and sensory-sensitive design

Young people with disabilities often encounter learning environments that don't account for different sensory, cognitive, or physical needs. Digital tools may not be accessible by default.

What to do:

- Use Universal Design for Learning (UDL) principles by providing information in a variety of media (text, audio, and visual) and enabling multiple approaches to task completion.
- Include assistive technology such as keyboard navigation shortcuts, text-to-speech programs, and screen readers.
- Develop sensory sensitivity by letting students set the pace and avoiding excessive material.

## 4.5 LGBTQIA+ Youth

- Safe learning spaces and inclusive examples in projects
- Visibility, language respect, and pronoun use in training content

In educational environments, LGBTQIA+ youth may experience discomfort, prejudice, or invisibility. Creating settings that are affirming and inclusive is essential to their involvement.

What to do:

- Provide respectful, welcoming environments where learners can express themselves freely. Using appropriate pronouns, gender-neutral language, and desired identities is an essential component of this.
- Integrate queer-inclusive material into case studies and examples. For example, prompts that explore themes of diversity, identity, or societal equity.
- Make LGBTQIA+ creators, activists, or technologists more visible when referencing AI's impact on society.



## 5. Tools for Inclusive and Adaptable Delivery

Creating an inclusive PES (Prompt Engineering Skills) education involves more than simply covering the subject matter; it also includes how it is delivered. Young individuals learn effectively when they feel seen, engaged, and supported. In order to assist educators, youth workers, and trainers in providing PES training in a way that is adaptable, youth-centered, and sensitive to a variety of learner needs, this chapter provides useful methods and tools.

### 5.1 Modular Learning Design and Personalization

Not all students progress at the same rate, and not all groups begin at the exact same stage. PES education can be divided into smaller, more manageable parts by employing a modular learning structure. These sections can be combined, matched, and modified according to the learning environment, learners' interests, and level.

#### Key practices:

- Design sessions as standalone modules (e.g., Intro to Prompts, Prompt Ethics, Image-Based Prompts), so learners can enter at different points or revisit topics as needed.
- Enable personalized educational pathways; some learners can go straight to creative applications, while others might require more time to learn basic digital skills.
- Use flexible methods to monitor progress, such as group reflections, prompt-based mini-projects, and self-assessments, by establishing clear learning objectives for every module.

### 5.2 Co-creation with Youth Advisory Groups

Particularly in the field of technology, young people offer important perspectives on what works and what doesn't. Involving them in the development of educational resources, formats, and examples is known as co-creation.

How to do it:

- Form a small advisory group for young people prior to starting the course. Simply their lived experience is required for this, and it can be done informally without the need for technical knowledge.
- Propose that young people evaluate draft materials, offer ideas for culturally relevant subjects, or even co-create example prompts.
- Include the views of young people in assessment and feedback procedures to make sure their recommendations influence next advancements.

Co-creation not only makes the training more relatable but also increases ownership and motivation among participants.

## 6. Inclusive Teaching Practices for Prompt Engineering Skills Facilitators

Delivering inclusive PES (Prompt Engineering Skills) education extends beyond the content or structure; it's about how facilitators present themselves in the learning space. The mindset, attitudes, and communication style of a facilitator play a critical role in creating environments where all youth feel safe, respected, and supported. This chapter outlines key practices for facilitators who want to build trust, reduce barriers, and promote full participation across diverse youth groups.

### 6.1 Cultural Sensitivity and Anti-Bias Training

Facilitators bring their own assumptions and cultural perspectives into the learning space, often without realizing it. In diverse groups, this can unintentionally create exclusion or discomfort. Building cultural sensitivity and undergoing anti-bias training can help educators recognize and interrupt these patterns.

Tips for practice:

- Reflect on your own biases and assumptions about gender, ability, ethnicity, or technology use.
- Avoid generalizations (e.g., assuming all youth are digitally fluent or uninterested in tech).
- Be mindful of culturally loaded terms, metaphors, or humor that may not translate well across groups.
- Include multiple perspectives in case studies or AI scenarios to reflect the diversity of experience.

Training in inclusive pedagogy and anti-discrimination can significantly enhance your ability to create welcoming and respectful learning environments.

### 6.2 Empathy and Youth-Centered Communication

Effective facilitators listen as much as they teach. Empathy is the ability to understand and respond to learners' feelings and perspectives, which is essential when working with young people from diverse backgrounds.

What this looks like in practice:

- Use open-ended questions and active listening techniques to invite feedback and ideas.
- Validate learners' contributions and allow space for hesitation or uncertainty, especially when trying something new like prompt writing.
- Be flexible in expectations. If a learner struggles with digital access or confidence, offer alternatives or extra time.
- Frame mistakes as learning opportunities rather than failures.

A supportive tone and flexible approach can help build the trust learners need to take creative and intellectual risks.

### **6.3 Building Trust and Belonging in Group Settings**

Many youth, especially those from marginalized backgrounds, have had negative experiences with formal education. Creating a sense of psychological safety is key to helping them re-engage with learning.

How to foster belonging:

- Set group agreements at the beginning of the course (e.g., respect, non-judgment, confidentiality).
- Encourage peer support and collaboration through group activities, shared projects, or co-creation sessions.
- Recognize and celebrate diverse contributions, not just technical ability, but also creativity, leadership, and curiosity.
- Be consistent and approachable. Regular check-ins, encouragement, and respectful correction go a long way in building mutual trust.

When learners feel that they belong and are respected for who they are, they are more likely to stay engaged, take initiative, and develop deeper confidence in their skills.

## **7. Conclusion and Call to Action**

Delivering Prompt Engineering Skills (PES) education in an inclusive, accessible, and relevant way is not just a matter of good teaching; it's a commitment to equity, empowerment, and digital justice. As artificial intelligence becomes increasingly embedded in everyday life, we must ensure that all young people, regardless of background, identity, or circumstance, have the tools and support they need to participate fully and confidently in shaping the digital world.

## 7.1 Summary of Key Adaptation Strategies

Throughout this framework, we've explored how PES education can be customized to meet the needs of diverse youth groups by:

- Identifying core and flexible elements of the curriculum.
- Conducting needs assessments through youth consultations and digital readiness checks.
- Adapting language, tone, and examples to reflect learners' cultural, social, and linguistic realities.
- Designing with inclusion in mind across gender, ability, geography, migration status, and more.
- Applying inclusive teaching strategies that foster empathy, trust, and belonging.

Together, these approaches offer a pathway toward truly inclusive AI education that values every learner's voice.

## 7.2 Risks of Exclusion in AI Education and How to Avoid Them

If we fail to design PES education inclusively, we risk reinforcing the very inequalities that AI has the potential to solve. Marginalized youth may continue to be excluded from digital spaces due to:

- Language barriers and inaccessible platforms,
- Cultural or gender-based stereotypes,
- Lack of digital infrastructure or connectivity,
- Educational content that ignores their lived experiences.

To avoid these risks, educators and institutions must:

- Prioritize access in both online and offline formats,
- Train facilitators in cultural sensitivity and adaptive methods,
- Actively seek out and respond to youth feedback,
- Design content that is representative, relatable, and responsive.

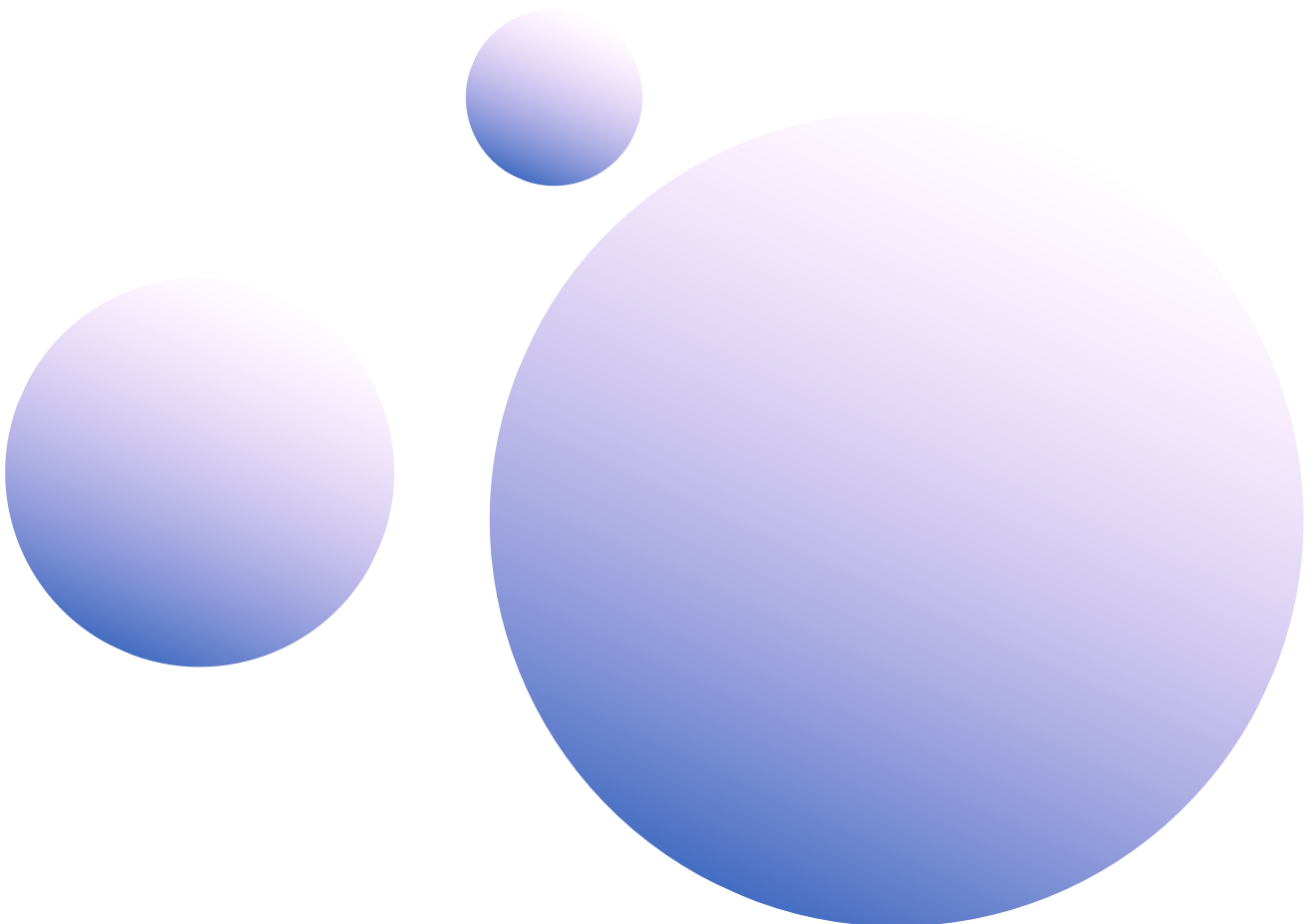
## 7.3 Moving from "Access" to "True Participation"

Inclusion means more than simply offering a seat at the table. True participation involves agency, creativity, and the opportunity to shape one's own learning journey. PES education should be a space where young people feel empowered to:



- Ask questions
- Try, fail, and try again,
- Express their identities,
- Connect their learning to real-world change.

This shift from passive access to active participation requires a mindset of co-creation, trust-building, and openness to learning from youth, not just about them.



# Conclusion

As artificial intelligence becomes a defining force in the 21st-century economy, education must shift to not only equip youth with technical skills but also to empower them with the **ethical understanding, adaptability, and creativity** needed to thrive. The Prompt Engineering Skills (PES) presented in this framework represents a vital response to the growing need for modern, learner-centered approaches. Within the scope of this project, PES aims to develop key competencies in young people through inclusive, engaging, and innovative teaching methods that support active learning, critical thinking, and the practical application of knowledge.

By promoting education that is tailored to individual needs and accessible to all, Prompt Engineering Skills (PES) directly contributes to improving the employability of young people—particularly those in the NEET category (not in employment, education, or training) and persons with disabilities. The strategy supports their integration into the labor market by fostering transversal skills, personal autonomy, and the ability to adapt to current labor market demands, while also encouraging social inclusion and equal opportunities.

- In Part 1, the framework established the importance of Prompt Engineering Skills (PES) as a foundation for youth development, employability, and inclusion. In a world where AI impacts every sector, PES ensures that education systems are responsive to both technological change and social equity.
- In Part 2, we explored how Prompt Engineering Skills (PES) can be embedded in non-formal learning (NFL) and project-based learning (PBL)—creating accessible, modular, and experiential opportunities for all youth, especially those furthest from traditional academic paths.

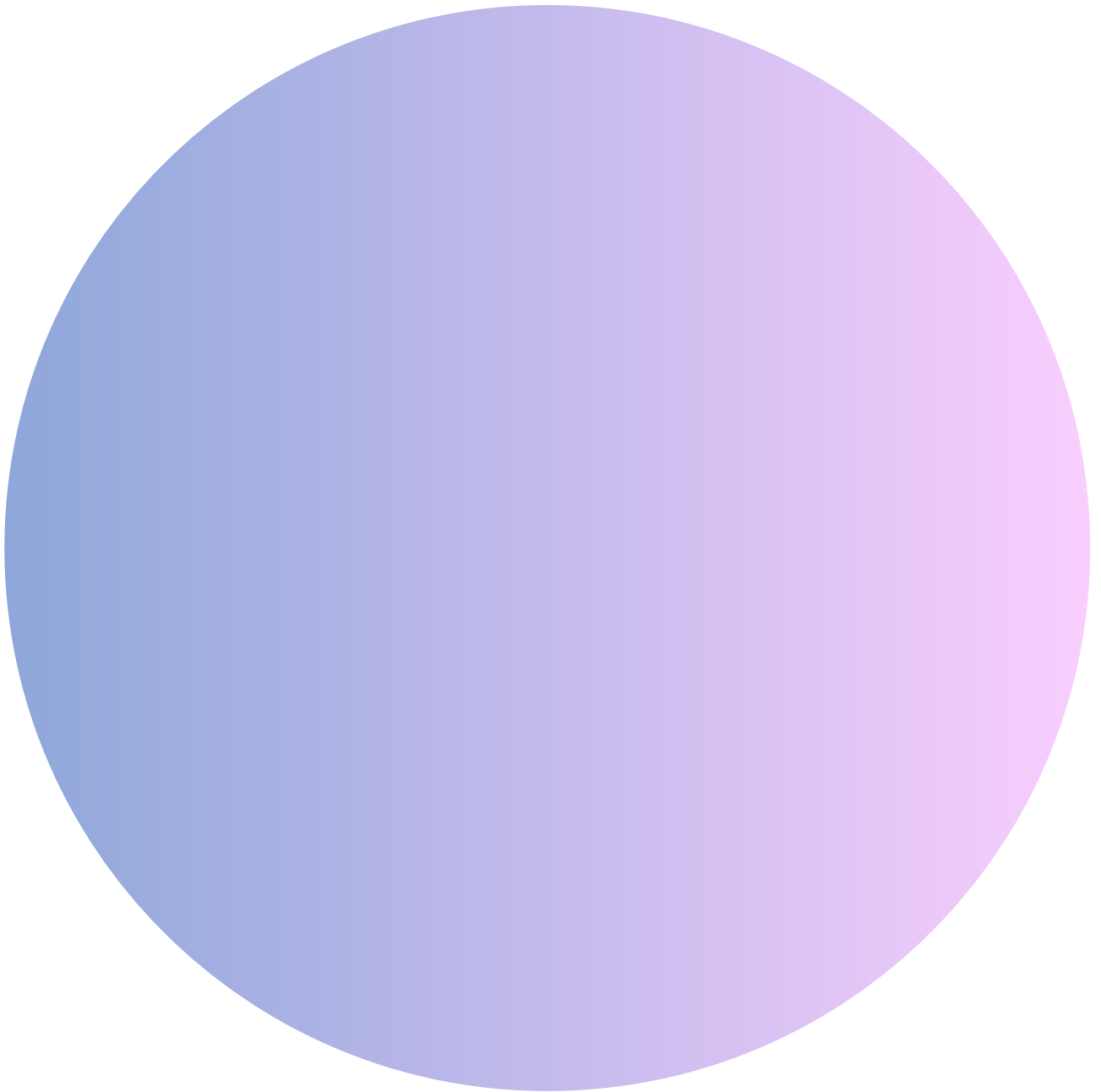
- In Part 3, the framework emphasized the power of media tools—humor, visuals, and storytelling—to increase engagement and cognitive retention. These approaches are critical when teaching abstract topics like AI, especially to learners with diverse literacy levels and learning styles.
- In Part 4, we addressed the importance of customizing Prompt Engineering Skills (PES) for different youth groups. Inclusive AI education must respond to the needs of marginalized, rural, migrant, neurodiverse, and gender-diverse youth, ensuring that all learners see themselves reflected in the content, format, and values of the learning process.

Together, these principles support a powerful vision: a future where education is not merely a means of transmitting knowledge, but a platform for equity, autonomy, and innovation. In this vision, the Prompt Engineering Skills becomes a bridge to employability and social inclusion, offering young people—especially those in the NEET category and persons with disabilities—the opportunity to actively and consciously participate in shaping an intelligent, ethical, and equitable society.

By investing in flexible, engaging, and inclusive pedagogical strategies, this project does more than teach skills—it amplifies youth voices, democratizes access to opportunity, and lays the groundwork for a future in which all young people can thrive in the age of AI.

This is not just a framework. It is a commitment—to inclusion, to relevance, and to youth empowerment through purposeful, future-facing education.

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