

# AI4AL

## Matching Tool

### Narrative report of the Creation process

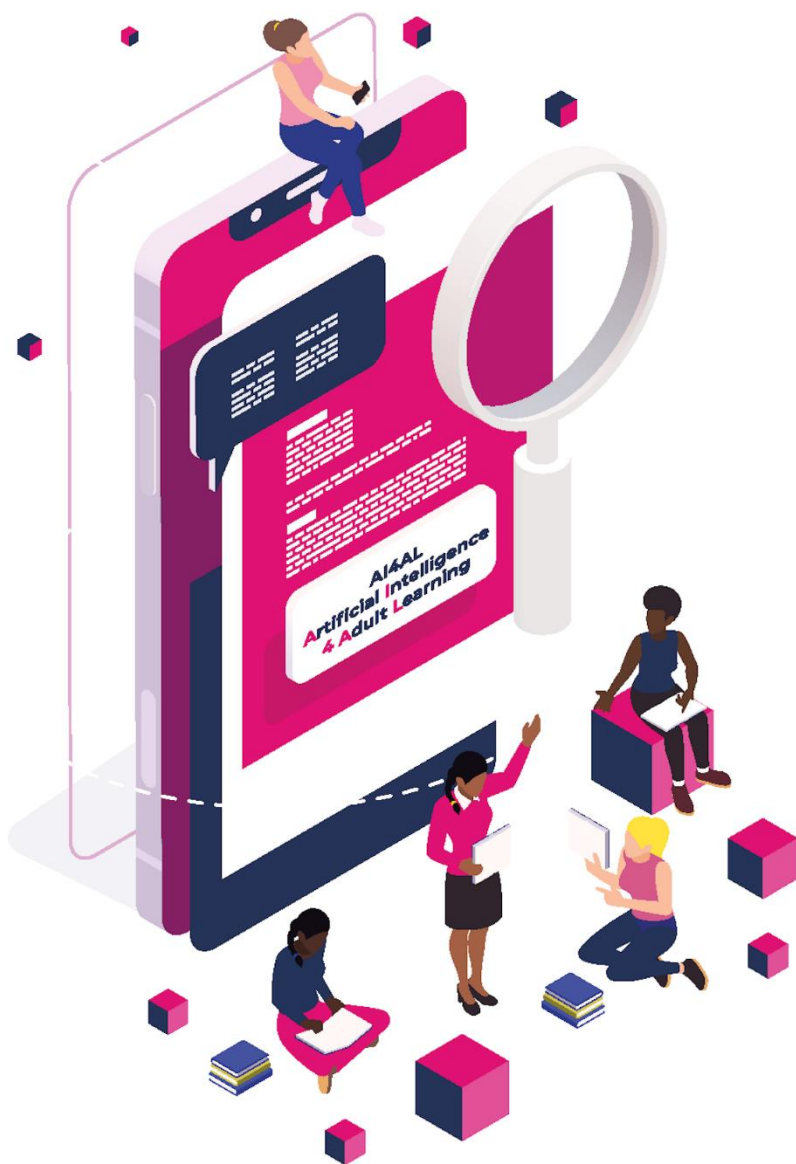
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Artificial Intelligence 4 Adult Learning

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## Disclaimer

This report and the AI4AL Matching Tool are consistent with data protection laws under the GDPR. The rights of use and consent are secured for all pictures used in the Matching Tool under our responsibility.

The Matching Tool will receive continuous minor improvements for the duration of the project, as well as ongoing maintenance and support for the agreed runtime after the project’s end.





## 1. Introduction

The **Artificial Intelligence for Adult Learning (AI4AL)** project is a forward-looking initiative funded under the Erasmus+ Programme, aiming to revolutionize adult education through the integration of artificial intelligence (AI) technologies. In a world increasingly shaped by digital transformation, adult learning providers face both challenges and opportunities in enhancing accessibility, personalization, and efficiency. AI4AL seeks to address these demands by fostering a conscious and informed adoption of AI in adult education. By empowering educators with innovative tools and methodologies, the project aims to demystify AI, promote trust in its applications, and enhance the quality of adult learning experiences across Europe.

The project is built on three pillars: developing a participatory methodology for AI adoption, creating an AI-powered matching tool to link skills assessment with tailored learning opportunities, and equipping educators with the necessary training to integrate AI solutions into their practices. These objectives align closely with European Union priorities, including digital transformation, inclusion, and the enhancement of lifelong learning opportunities. With the involvement of key partners from diverse sectors—ranging from education associations to technology developers—the project is positioned to make a meaningful impact at both local and transnational levels.

A cornerstone of the AI4AL initiative is the development of the **AI4AL Matching Tool**, an innovative solution designed to address a critical gap in adult learning: the ability to effectively connect learners' assessed needs with personalized learning opportunities. The original idea for the tool emerged from a shared recognition among educators and technologists of the potential for AI to streamline the process of designing and delivering customized learning paths. Traditional methods of identifying and addressing learners' digital skill gaps often rely on fragmented and time-intensive approaches, leaving many adult learners underserved or excluded from meaningful opportunities.

The Matching Tool leverages AI to address these challenges by automating and refining the alignment between learners' digital competencies, as assessed through self-evaluation, and available educational resources such as micro-credentials and modular courses. Drawing on frameworks like DigComp and ESCO (European Skills, Competences, Qualifications and Occupations), the tool ensures that the recommendations are both comprehensive and tailored to individual needs. The result is a system that not only accelerates the matching process but also improves its accuracy, creating more impactful learning pathways for adults, particularly those from marginalized or disadvantaged backgrounds.

What sets the AI4AL Matching Tool apart is its participatory development process. The tool has been designed collaboratively, involving educators, learners, and technical experts at every stage. This inclusive approach ensures that the tool is not only functional but also resonates with its end-users, addressing real-world challenges faced by adult educators and learners. By integrating the expertise of educators, the tool avoids biases in data collection and interpretation, creating a reliable and equitable resource.





Ultimately, the AI4AL Matching Tool embodies the broader vision of the project: to empower adult educators and learners to harness the transformative potential of AI in ways that are accessible, ethical, and impactful. Through this tool, AI4AL aims to set a new standard for integrating technology into adult education, fostering a culture of lifelong learning that is inclusive, responsive, and future-ready.

## 2. Testing and Feedback

As part of its mission to integrate artificial intelligence into adult learning, the AI4AL project embarked on an ambitious journey to develop the AI4AL Matching Tool — a cutting-edge, AI-powered solution designed to assist adult educators in matching learners with the most suitable training opportunities. The tool’s development was primarily led by SkillLab, who started the process on the basis of their core technology. From the start of the AI4AL Matching Tool development in 2023 to its finalisation in 2024, the tool has gone through different iterations which were then tested and improved based on the valuable feedback. Before reaching the current version of the tool, a total of three different versions were put to the test. The development timeline in Figure 1 illustrates the processes, tests and iterations the tool went through till its official release.

### 2.1 Tool Versions

#### Version 1: The “Raw” Tool

The initial or “raw” version of the tool was ready for testing in April 2023. This version was based on an early configuration of SkillLab’s core technology and only contained the learners application with an AI whose recommender and matching function was not yet trained on specific data from the adult education space. This version was tested by 10 adult educators, the so-called Beta Tutors, and developed further based on their feedback, as is demonstrated in more detail in chapter 2.2.

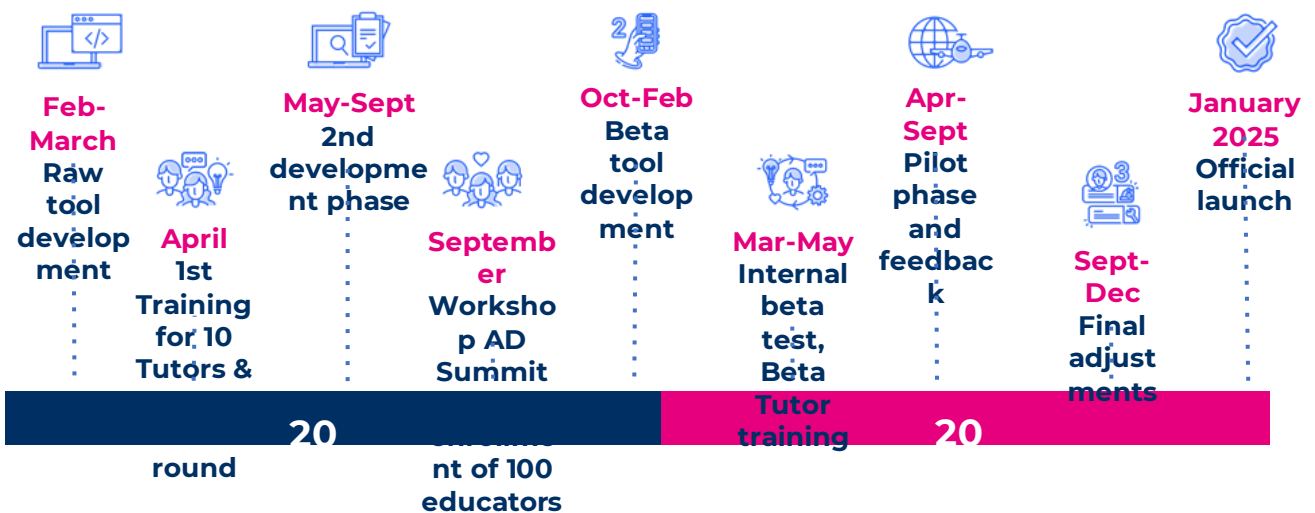


Figure 1: AI4AL Matching Tool Development Timeline





## Version 2: Lite Tool

The second version of the tool consisted of a “lite” version of the learners application (without the career feature), based on the first testing feedback. Instead, it included a new portal for educators to monitor the learners’ skills data and skills assessment progress. A test was done using this version for a group of adult educators during a workshop at the All Digital Summit 2023 in Croatia (see chapter 2.3), resulting in feedback that showed a preference for keeping the career feature for learners.

## Version 3: Beta Tool

Based on the previous workshops and feedback, the beta version of the tool was developed. This encompasses the learners’ application with improved career features and the educators’ portal. The beta version was then put to test with more than 90 educators during the pilot phase (see chapter 2.4).

## Version 4: Final Tool

Based on the feedback from the pilot phase, further improvements were made, resulting in the final version of the AI4AL Matching Tool for the official launch. A big part of this last improvement phase focused on data privacy through the implementation of different access levels (see chapter 3.1 for more information).

## 2.2 First Beta Tutors’ Input

The first “raw” version of the tool was demonstrated and tested by 10 Beta Tutors from 6 countries during the first training in Amsterdam from 19 to 21 April 2023. At this point, the tool only consisted of the learner application. The Beta Tutors were introduced to the initial version of the Matching Tool in order to test its interface and to access the user experience, as well as to train the AI on the relevant data from the Beta Tutors in order to better adapt its recommender function to the target group.

This training session resulted in the following initial input from the Beta Tutors:

- Develop an educator portal to complete the experience of the target group.
- Narrow down the subject/occupation fields available in the matching tool to focus only on those relevant to adult learning. Initially, there was also a discussion about the relevance of career characteristics for the target group.
- Improve the performance of the AI-based skills recommender in the tool.
- To focus more on the life experience feature (previously called other experience) and improve its flow due to its relevance to the target group.
- Use the AI4AL brand colours for the matching tool.
- Make the tool more user-friendly in general.

## 2.3 All Digital Summit Workshops 2023 and 2024

The Matching Tool was also tested with different groups of adult educators at both All Digital Summits in Croatia and in Madrid. The first workshop took place during the All Digital Summit on September 26th, 2023, in Zagreb, Croatia. Based on partial feedback from the first Beta Tutor training, a simpler lite version of the Matching Tool was used and tested at this event. This version of the tool focused only on the learner's skills





assessment and CV building, removing the career feature completely for easier use and navigation.

The newly developed educator portal was also presented to the session participants for the first time. After exploring the educator portal, the participants agreed that the career feature should be reinstated in the learner app. They agreed that this feature would benefit learners even more, despite the longer time it takes them to complete the process in the application. In addition, the career feature allows adult educators to be more creative in their use of the tool with their learners. Based on both the feedback from the Beta Tutor training and the first All Digital Summit workshop, the career feature was added again but narrowed down to selected career fields and occupations, which were identified as especially relevant to the adult education sector, during a separate workshop between the AI4AL project partners.

The second All Digital Summit workshop was held October 17th, 2024, in Madrid. Here, a version of the tool based on the first round of feedback from the pilot phase was presented together with the AI4AL Engagement Kit. Participants were invited to test the tool, present their first impressions, potential use cases, and give feedback for the last round of improvements before the tool's official release.

## 2.4 Pilot Phase

Following extensive development and iterative refinement led by SkillLab, the tool had to go through a consistent piloting effort. This phase marked a significant milestone in validating the tool's potential to transform the adult education landscape.

The initial development of the Matching Tool began in February 2023, resulting in an early version that was rigorously tested by a select group of educators. Feedback gathered during these initial trials, alongside insights from the tool's demonstration at the All Digital Summit in Croatia, was instrumental in shaping its functionality and design. These iterative improvements culminated in a refined beta version, which incorporated valuable updates such as a targeted focus on relevant fields of adult education and the introduction of an educator portal to support educators in tracking and managing learner progress.

The beta phase pilot, launched in March 2024, engaged over 90 adult educators across partner countries. A comprehensive training session prepared a core group of beta tutors to cascade their expertise and introduce the tool to their peers. This phase also featured extensive feedback collection, including step-by-step user guides, interviews, and real-world testing scenarios. The feedback was integral to adapting the tool to the needs of educators and learners, ensuring it met its goal of facilitating personalized, effective, and accessible learning pathways.

As we present the results of this pilot phase, we celebrate the collaborative effort that has brought the AI4AL Matching Tool closer to its final version—ready to redefine the future of adult learning.





## Feedback

During the pilot phase we received 23 feedback forms from participating learners and 24 feedback forms from educators. See Table 1 for the number of feedback we received per country/language:

	Germany	Romania	Spain	Italy	Switzerland	Various countries (English speaking)
Learners	14	4	3	0	2	0
Educators	2	3	4	5	9	1

Table 1: Feedback per country/language

The feedback from both learners and trainers was overwhelmingly positive. Only some minor constructive feedback was given to improve elements of some features.

Learners participating in the pilot especially appreciated the skills assessment and the CV generator feature of the Matching Tool. However, opinions on the career exploration feature varied between countries. The main constructive feedback on the career feature was the difficulty of finding a career match. To address this issue, further improvements to the career recommender were made. Additionally, the selection of available careers and occupations was further adjusted to allow for more variety and accuracy in the career matches.

Similarly, the educators appreciated the CV generator feature and the general usability of the learner application. They also commented positively on the educator portal and its ability to invite multiple learners and monitor their progress. The need to improve the career feature was also expressed by some educators, who made a strong case for the improvement mentioned above. There were also some suggestions to improve the translation or localisation of the Matching Tool, which is further addressed in chapter 3.

The most important feedback from educators was their concern about the data privacy for the learners. The version used in the pilot did not restrict the teacher's view of the learner profile to their own students, but instead allowed all teachers of an institution to see all students who had signed-up under their institution. Although a temporary solution was used to ensure the necessary level of data privacy during the pilot, this solution was not sustainable for the long-term implementation of the tool. Therefore, during the last big development phase before the official launch, we implemented a new access level system to limit the teacher's view to their own students only, which is described in more detail in chapter 3.1.

## Use Cases

The creation of use case scenarios is an essential step in demonstrating the practical applications of tools like the AI4AL Matching Tool. Use cases provide structured examples that guide users in harnessing the full potential of such tools, offering







actionable insights and fostering innovation in real-world contexts. By grounding abstract functionalities in relatable scenarios, they bridge the gap between theory and practice, making advanced tools accessible and impactful for diverse audiences.

To this end, we developed three dynamic use cases tailored to showcase the AI4AL Matching Tool's versatility. The first use case explores how the tool supports learners and educators in analyzing skills and shaping personalized learning pathways, fostering both self-awareness and curriculum alignment. The second highlights its application in modernizing job coaching, enabling streamlined career discussions and AI-powered solutions like multilingual CV generation. The third demonstrates the tool's capability to build micro-credentials, using aggregated data and the ESCO taxonomy to address specific skill gaps and promote lifelong learning.

Namely:

1. **Exploring Skills and Shaping Learning:** The tool fosters skill reflection and personalized learning by helping educators analyze learner data to design relevant curricula ([full access](#)).
2. **Modernizing Job Coaching:** Job coaches streamline career discussions and skill mapping using multilingual, AI-powered CV creation tools ([full access](#)).
3. **Building Micro-Credentials:** Educators create tailored micro-credentials using aggregated learner data and the ESCO taxonomy ([full access](#)).

Beyond these examples, the true power of the AI4AL platform lies in its flexibility. Users of our wiki are encouraged to create their own scenarios, expanding the horizons of how this tool can be applied. This collaborative approach ensures that the AI4AL Matching Tool evolves with its community, unlocking endless possibilities for education and career development.

### 3. Development and Adjustments

The AI4AL Matching Tool underwent a series of adjustments and developments throughout the project. The adjustments were made based on the feedback received from the Beta Tutor training, the All Digital Summit workshops, and the pilot phase with more than 90 educators. Below is a more detailed overview of the adjustments made to optimise the matching tool for the final launch:

#### Determining Needed Features

The first version of the tool focused mainly on the assessment of learners' skills. Therefore, the educators portal was added only at a later stage, at the request of the Beta Tutors, in order to monitor the outcome of the learners' skills assessments. From here on, the matching tool consisted of two parts: The learner application and the educator portal.

During the first Beta Tutor training, there were mixed opinions on the time necessary to complete the process in the application. Some tutors doubted the necessity and relevance of the career feature for two reasons: Firstly, many of the career fields are not relevant to adult educators and make it seem as if the tool is tailored primarily to





vocational education. Secondly, the careers feature means more work for adult educators to explain the careers recommended to learners based on their skills. It is also more time consuming and potentially confusing for the learner when using the application. Following this feedback, the tool was adapted to make it lighter without the career feature (lite version).

However, testing the tool with more adult educators at the All Digital Summit in Croatia showed that most educators had positive opinions about the career feature. This test result and feedback motivated us to continue with the original full version of the matching tool with an improved career feature and a selection of specific career fields deemed relevant for the adult education space.

### **Careers Selection (Workshop)**

In order to enhance the functionality of the career feature of the Matching Tool, a workshop session was held during the Transnational Partner Meeting (TPM) during November 2023 in Frankfurt, Germany. All AI4AL partners participated in a thorough review of a list of career fields and occupations provided by ESCO, with the objective of identifying the most relevant field and occupations for the adult education space. Furthermore, five of the most relevant occupations were identified for each selected career field. The outcome of this workshop was employed to modify the career taxonomy in the matching tool with the objective of enhancing its usability for the target group.

However, this action revealed a limitation that became evident during the pilot phase. The restricted range of career options made it more challenging for learners to identify a suitable match. Following the collection of feedback from the pilot phase and a comprehensive review of this topic, the decision was taken to maintain the selection at the career field level and to make all occupations under each selected career field available in the tool.

### **AI4AL Design (Whitelabeling)**

After initial testing with the beta tutor, it was agreed that the AI4AL design should be incorporated into the Matching Tool to brand its identity as a product of the project. The white-labelling includes several components, ranging from adding the AI4AL logo, changing the interface colours to the AI4AL brand colours, and adding the link to the project website in email templates. The AI4AL logo and colours are also used in all documentation downloaded from the corresponding tool.

### **Language: Translation and Localisation**

From the beginning, the matching tool was intended to be accessible in all languages spoken by all AI4AL partners, namely English, German, Italian, Romanian, Spanish, and French. Moreover, the matching tool is accessible in several other EU languages and languages commonly used by migrant communities in Europe (which constitutes a portion of our target group), including Ukrainian and Arabic. With the exception of the skills and careers information, which were derived directly from ESCO, the initial translation of the tool was conducted using an automated translation tool in combination with input from the SkillLab team. The translation and localisation process was overseen by all partners throughout the project, with regular updates provided on its progress.





The preliminary feedback on the translation aspect during the testing and pilot phases indicated that the quality of the translation was adequate for the launch.

Nonetheless, a degree of prioritisation was necessary with regard to the localisation process, given the constraints of time and the comparative effort required to implement this improvement in the context of the limited feedback received. As a consequence of the aforementioned constraints, the localisation of the educational degree selection in the skills assessment feature of the learners' application was deprioritised. Given the potential for learners to come from any country in the world, it would be impractical to include all educational degrees available on a global level. It was therefore decided that the most common educational degrees in Europe should be the sole focus, with educators providing assistance to learners in identifying the most closely aligned option to their educational degree.

### **Ongoing Improvements of the Recommender**

The recurring feedback from the various testing sessions was about the AI-powered skills and career recommendations in the tool. Among the feedback was a suggestion to make the recommendation more accurate from the start. This means that the AI needs to learn about a user's background and information more quickly in order to provide much more accurate recommendations from the start. After some improvements to the logic and code, the current version of the matching tool can provide better recommendations to users. A certain number of skills to choose from is also set to give learners a sense of security when completing the skills assessment. As of now, they need to select 10 skills for the AI to learn about them and make more accurate recommendations.

### **Improvement on Life Experience Flow and Language**

In response to feedback about placing more emphasis on the non-occupational and -educational experiences, improvements have been made on the life experience feature. The name of this feature has been changed from "other experiences" to "life experiences" to reflect its equal importance to work and education experiences. In addition, the assessment flow for life experiences is slightly different from the normal flow for work and educational experiences. Instead of asking learners to select the skills immediately, a pre-selected skill was presented for them to review first. This allows learners to find the skills faster, which was quite challenging to do for informal experiences, as revealed during some tests and pilot sessions.

### **Link to Project Website**

Adding a link between the matching tool and the AI4AL project website was the final development related to the branding and white-labelling of the tool. The feedback came from internal testing with partners, where it was agreed that educators and learners should be able to learn more about the project providing the tool from the tool itself. It also links the tool to the rest of the support packages for educators and learners available on the website. This link is placed under the profile page section of the learner application.

### **Theory of Change**

As a final touch, SkillLab's Theory of Change was implemented in the tool in form of two questionnaires, surveying learners on their relationship with and awareness of their skills and career plans. This allows assessing the tool's impact on its users in the context of career and education orientation, as well as general confidence and



awareness of users' own experiences, skills, competencies and knowledge, enabling further improvements in the long run.

### 3.1 Data Privacy: Access Levels

As mentioned in chapter 2.4, in preparation of the pilot phase a bigger concern around sufficient data privacy and adherence to the General Data Protection Regulation (GDPR) became apparent. What looked like a minor adjustment from the outside, turned out to be a bigger development phase on the backend side of the Matching Tool. In the educator portal, all educators of the specific portal have access to the data of learners who have been invited to the portal.

For the pilot, this access was resolved by limiting the tool to one portal per institution, thus only allowing for educators of the same institution to access data of the institution's students. Additionally, Data Processing Agreements were signed with all parties acting as administrators and thus data controllers during the pilot. While satisfying basic GDPR needs, this temporary solution was neither sustainable (as the portal management from SkillLab's side would become too complex for the official launch in the long run) nor optimal in terms of GDPR compliance.

As a result, the backend set-up of the tool was improved by adding a new access level specifically for the educators' access. This level now allows for educators to only see the data of the learners they have personally invited or have been assigned to by an administrator. This allows for a further restriction of data access to the necessary level: Educators can only access their own students' data instead of that of all of an institution's registered students in the application. As shown in Figure 2, this changed how the tool is set up to begin with, as well the way it is administered, also resulting in the registration process now in place for the AI4AL Matching Tool.

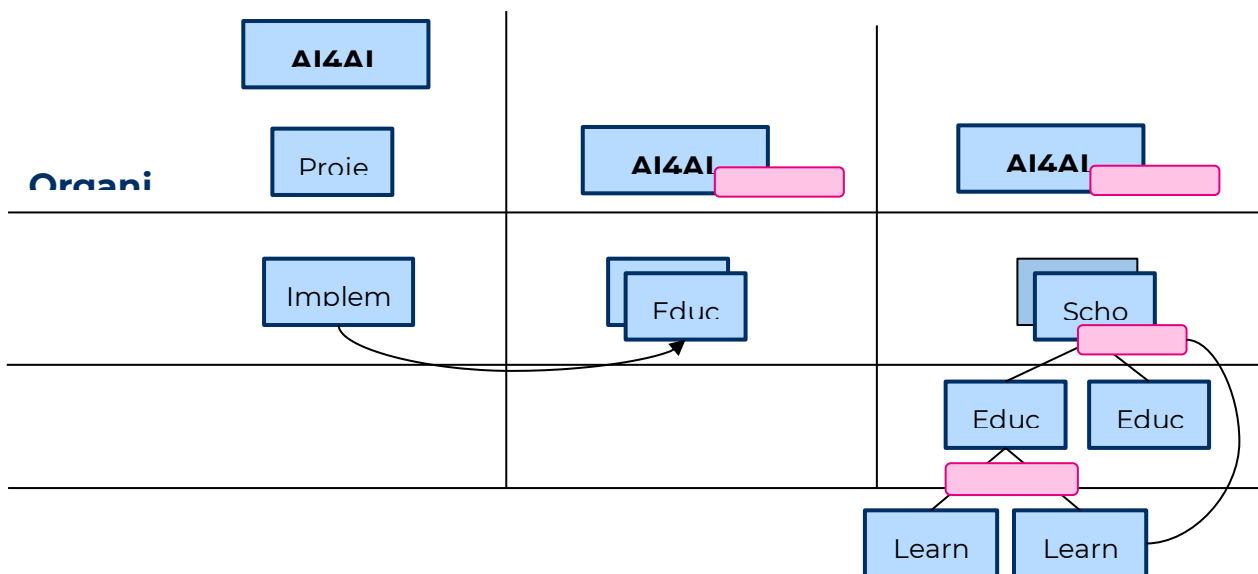


Figure 2: Access Level Evolution



## 3.2 Registration Process

For the official launch of the tool, a specific registration process is in place. Since the educators and their institutions will be handling the private data of the learners, a specific set-up as well as a specific Data Processing Agreement (DPA) has to be in place for every implementation of the Matching Tool to assure sufficient data protection in compliance with the GDPR. To assure this, educators or their institutions' representatives can register for the tool via a registration form. SkillLab will then process the registration and contact the institution for the signing of the DPA. This will clarify the extent of data access granted to the institutions and educators, as well as the specifics of the data processing done on SkillLab's part as the technology provider.

After the DPA is signed, SkillLab will create a dedicated Matching Tool portal for the institution, who can then invite their educators and learners to use the respective applications. This way, SkillLab will remain as the technology support throughout the AI4AL Matching Tool's runtime while the institutions administer their own portals after their portal has been created. This allows for both the necessary security measures, as well as a free creation of different use cases on the side of the educators.

To get started with the AI4AL Matching Tool, [register here](#).

## 4. Conclusion

In order to develop the AI4AL Matching Tool, the support and input from all the educators, learners, and technical experts has been extremely valuable from the start. This collaborative and inclusive process has enabled a design that is both practical and aligned with user needs. The understanding of real-world challenges faced by adult educators and learners has grown throughout the project and with it every iteration of the Matching Tool. The contributions from educators across Europe have resulted in a tool that is both effective and equitable. By incorporating their insights, the tool minimizes biases in data collection and analysis, offering a dependable and fair resource.

Based on all of this, the final AI4AL Matching Tool now consists of the following components:

- **User App:** A mobile application designed for learners to assess their skills, explore selected career paths, and download personalized CVs.
- **Educator Portal:** A comprehensive portal for educators to manage user profiles, create groups, monitor progress, and use the generated skills profiles to create personalized recommendations and learning paths.

Additionally, AI4AL offers further results which compliment the tool and enhance educators' proficiency when working with both the AI4AL Matching Tool and AI in general in the adult education space:

- **The AI4AL Engagement Kit** ([full access](#))
  - A **Methodological Guide** describing the rules of engagement of educators and learners in the process of adopting AI-based technologies, as well as information materials about the fundamental concepts of AI.





- A **Scenario Repository** offering practical examples in form of use cases derived from the Matching Tool piloting phase, as well as allowing for future examples to be added by educators.
- **The Self-paced Training Path:** A 30 hours self-paced online course equipping educators and professionals with the knowledge and skills they need to effectively integrate AI into their teaching methodologies ([full access](#)).

The overwhelmingly positive feedback from the final testing phase during the pilot adds to our confidence in what has been developed over two years of fruitful collaboration. At its core, the AI4AL Matching Tool reflects the project's overarching mission: empowering adult educators and learners to leverage AI's transformative potential in ethical, accessible, and meaningful ways. With this innovation, AI4AL aims to redefine how technology supports adult education, cultivating an inclusive, adaptive, and forward-thinking culture of lifelong learning.





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