Skill Match
Smile
in an Intelligent Learning Environment

BETA VERSION OF

THE SMILE MODEL

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THE BETA VERSION OF THE SMILE MODEL

Taking into account what has already been reported in the other WP2 outputs, the beta version of the SMILE model, based on the "Conf4People" model and on the use of some of the tools from the "TaiLENT" platform of the CONFORM partner, implemented with the contribution of the partnership, not only with the linguistic adaptation of the Self-Assessments (see in detail what is reported in the document WP2 SMILE - DRAFT OF THE ANALYSIS MODEL), but also of the feedback and observations collected during the workshops carried out by the partners in their national reference contexts and of the mapping of the educational resources to be connected to the recommendation system, represents an advanced human resources management system based on the competence-based approach, designed to respond to the specific training needs of organizations in general, but with a particular focus on Higher Education Institution, for the assessment and development of the skills needed to face the challenges of the digital age, sustainability and internationalization.

This model stands out for its ability to map, monitor and improve skills at an individual level, and to provide targeted and personalized training recommendations, not only to meet the immediate needs of organizations, but also to ensure continuous and resilient preparation to face future challenges and market evolutions.

Adopting a competence-based approach, influencing every phase of the training process, allows HEIs to map, monitor and improve their student' skills in a targeted and personalized way, rather than relying on generic solutions that may not effectively respond to individual needs.

In a context where digitalization, sustainability and internationalization are key factors for competitiveness and growth, the adoption of the SMILE Model helps to identify and address individual skill gaps, promoting learning solutions capable of filling these gaps.

The connected "TaiLENT" platform, which supports the application of the SMILE Model with its tools, thanks to its compatibility with multiple devices (PC, Smartphone and Tablet), allows flexible access to each user at any time and place, thus increasing the effectiveness of the training process. In particular:

- students can access the use of "recommended" learning materials in response to the gaps identified in relation to the skills analysed with the self-assessments assigned by the organisation to which they belong;
- HR function managers and/or training experts have the opportunity to:
    - **monitor student training activities**, checking progress in skills and using advanced functions for analyzing data relating to individual skills.
    - **have a flexible and customized system** thanks to which it is possible to automatically generate, with the support of generative Artificial Intelligence:
        . self-assessment questions and related answers aimed at analyzing and evaluating the skills possessed by one's own students in relation to those specific to each professional profile selected by the platform for the European Classification of Skills/Competences, Qualifications and Occupations (ESCO), which maps skills in a homogeneous and recognized way at European level;
        . hetero-evaluation questionnaires to detect the level of possession at individual level of their own dependent staff of digital, green, entrepreneurial skills and skills related to specific soft and hard skills, contextualized to the specific organizational, production and distribution characteristics of the organization.
        The panel of questions and related answers auto-generated by AI based on the various documents made available by the organization itself (e.g.: work procedures, manuals, promotional-communication documents, etc.), allow to detect the level of possession and exercise of those skills that respond to the actual business needs and to the reference market context of the organization in continuous evolution, so as to be able to respond promptly and in a targeted and personalized way with training interventions capable of filling the gaps that have emerged.
    - **use the monitoring and reporting functions**, which allow you to consult or download reports that provide useful information to make informed decisions.

The SMILE model, as defined in its beta version, which may be integrated with contributions from learning mobility and the experimental activity foreseen by WP4, is therefore configured as an innovative tool,

capable of responding to the needs of SMEs to improve human resources management and promote the continuous development of skills.

Its competence-based approach allows to quickly identify and fill the gaps detected, allowing organizations to remain competitive and ready to face global challenges in a rapidly evolving market, in which digital and green skills are increasingly central, as well as soft and hard skills such as negotiation, communication, collaboration, time management, project management and goal orientation.

Thanks to the AI-Based technological support of the "TaiLENT" platform, with the use of some of its tools and the recommendation system, the model is able to provide tailor-made solutions, which favor the integration of human resources in the growth and sustainability strategy of HEIs, promoting innovation and long-term resilience.

The SMILE Model and the Use of Artificial Intelligence

The SMILE model, integrated with the TaiLENT platform, emerges as an advanced and strategic solution designed to address the challenges that organizations and especially HEIs must face in a constantly evolving global context.

Digitalization, environmental sustainability and internationalization are now crucial factors for the competitiveness and sustainability of organizations in general and HEIs in particular.

The SMILE model fits perfectly into this scenario, highlighting the importance of a competence-based approach enhanced by the use of artificial intelligence (AI).

Artificial intelligence not only offers HEIs a competitive advantage, but it revolutionizes the way in which training and human resources development processes are managed, allowing them to anticipate future skill needs and proactively respond to market challenges.

AI acts as a predictive engine for analyzing existing skills and forecasting future skills, not just by collecting data about students and their current performance, but by helping to analyze emerging trends to identify the skills that will become crucial in the future.

This allows HEIs to strategically design and plan the development of their students, adopting an approach to the use of the different types of training resources available that is not only reactive, limited to filling the gaps related to the gaps identified by the analysis of existing skills, but also proactive, to prepare for future challenges, promoting the acquisition and/or consolidation and/or development of new skills needed to face technological changes, sustainability challenges and the evolution of internationalization.

Thanks to the use of AI, the SMILE model is therefore also able to propose training solutions that anticipate needs before they become problematic, thus improving the effectiveness and efficiency of the training process. In other words, thanks to the use of artificial intelligence, the SMILE model allows for a continuous and dynamic assessment of individual skills, monitoring progress and promptly detecting skill gaps.

The use of the "TaiLENT" platform tools, based on ML algorithms and generative Artificial Intelligence, allows the processing of data collected through Self-Assessments and/or interviews and/or interviews supported by each student, to personalize the training response based on the actual individual needs that have emerged in relation to the skills gaps identified, specifically recommending a variety of educational resources, structured in interactive and multimedia modules, such as training video pills, narrative branching scenarios, edu-games, podcasts, case studies, webinars and other in-depth materials, both free and paid.

Using artificial intelligence, the model:

- it does not only facilitate the adoption of training responses consistent with immediate needs, making the training process flexible, dynamic and adaptive to the needs of each student, in order to guarantee experiential and sustainable learning;
- but it contributes to building a path of professional growth for human resources, promoting the development of the skills needed to prepare students to work in a constantly evolving context and to face future global challenges, in order to allow HEIs to have a long-term strategic vision, enhancing company competitiveness thanks to qualified human capital aligned with their strategies.

The TaiLENT platform thus becomes a powerful tool to support the SMILE model, which thanks to the strategic use of artificial intelligence allows HEIs to:

- have advanced predictive capabilities of the skills needed to address not only current challenges, but also anticipate and respond proactively to future ones, in a constantly evolving global context, characterized by rapid technological changes, environmental challenges and new internationalization dynamics, in order to effectively plan the development strategies of their human resources and at the same time support their competitiveness in the long term;
- promote a culture of continuous learning, organizational flexibility and business resilience, which are essential to optimize the human resources management process, aligned with the strategic objectives of the business and responsive to the dynamics of change;
- **plan proactively** their future, with a sharp focus on building an agile, resilient and well-prepared workforce to meet the challenges of the global market.

THE SKILLS EVALUATION PROCESS

The SMILE model stands out for its innovative and highly specialized approach to skills assessment, adopting a dual-level methodology that allows for an extremely detailed, dynamic and personalized measurement of each user's individual skills.

This approach represents one of the distinctive features of the model, giving it added value in terms of precision, adaptability and effectiveness. The model, applied to HEIs, directly addresses the need to develop targeted and strategic training solutions, aiming to optimize human resources through a continuous process of self-analysis, monitoring and improvement.

The approach is divided into two complementary phases:

- **Macro level aggregation**

  The first phase of the evaluation process focuses on the aggregation of the ratings provided by users for each skill being analyzed.

  In this phase, the system collects data from all questions related to a specific skill and aggregates them into an overall skill score. This score reflects the overall assessment of the skill in question, allowing for a clear and concise overview of the student's capabilities in relation to each skill domain.

  The macro aggregation:

  - reflects an student's overall ability in a specific area of expertise, such as digital, green, entrepreneurial or soft skills.
  - identifies the skills already developed and those that instead require targeted training interventions to fill the gaps identified.
  - specifically recommends educational resources and any operational tools created and/or researched online, to be used free of charge and/or for a fee, depending on the level of coverage of the specific competence detected
  - provides useful information to guide HR function managers and/or training experts in identifying targeted courses for their students to attend and/or training plans to be designed and delivered at company level, together with consultancy, coaching and project work activities.

  This phase is therefore essential to provide a clear and accessible vision of the training needs of each student, regardless of their position or level within the organization. The aggregate score allows you to define strategic priorities, assigning resources and learning tools more efficiently.

  Retention at the micro level: granular skills analysis

  The second phase of the evaluation process, the micro-level retention phase, is a key element that allows the SMILE model to be truly personalized and detailed.

  In addition to the global overview, the model maintains and analyzes the ratings of each individual application, allowing for a much deeper and more granular examination of the student's skills.

  At the micro level, the SMILE model:

  - identifies specific strengths and areas of weakness by examining each individual user's responses to each question related to a given skill.

- provides a detailed view of gaps that might not emerge in a global analysis. For example, while the aggregate score might suggest good digital skills, the micro analysis might reveal that the student needs to improve in specific areas, such as the use of advanced software or emerging technologies.
- allows for much more targeted and precise training intervention, since educational resources and recommendations are adapted to individual needs.

This in-depth analysis allows you to monitor individual skill development over time, contributing to continuous improvement of your workforce. In addition, micro-level retention makes it possible to monitor skill development on an ongoing basis, fueling a feedback loop that guides your training plan and adaptation to future challenges.

Ultimately, the SMILE model, thanks to its dual-level structure, allows to optimize the human resources management process, promoting a corporate culture based on continuous learning, constant improvement and resilient innovation.

The combination of macro aggregation and micro retention provides a multidimensional assessment of each student's skills, which not only ensures an accurate snapshot of current skills, but also facilitates the design of highly personalized training plans.

The ability to analyze skills not only at an aggregate level, but also on specific aspects of skills, offers a precise and complete picture of training needs, ensuring that each intervention is targeted and consistent with the strategic objectives of the organization.

Ultimately, thanks to its dual-level structure, the SMILE model optimizes the human resources management process, promoting a corporate culture that is based on continuous learning, constant improvement and resilient innovation.

This approach fosters a workforce capable of evolving over time, adapting to new challenges and contributing to business success in an ever-changing market context.

In this way, organizations can trigger innovations and quickly adapt to regulatory changes and market dynamics, maintaining competitiveness and developing highly qualified human capital.

How the SMILE model processes skills assessments

The SMILE model develops skills assessments through a structured and methodical process, which ensures an accurate, reliable and complete assessment of each student's capabilities.

The three phases of the evaluation process

This process develops in three main phases:
- data collection,
- evaluation and scoring system,
- assignment of the level of competence.

1. Data collection

Data collection is the fundamental starting point for an accurate and structured assessment of skills.

Users are invited to complete a structured questionnaire, customized for each specific skill to be assessed. Each question in the questionnaire is designed to explore various aspects of the skill in question, ensuring a comprehensive and multidimensional assessment.

The answers provided are recorded in a structured dataset, which includes skill categories, unique identifiers for each question and the related scores, ranging from 1 to 4.

This data is stored in a management system that allows consistency between assessments. The structured responses are then analyzed through an automated data extraction pipeline, which performs a preliminary analysis of the responses, stores them, and connects them to predefined assessment parameters. This process ensures that every aspect of the skill is explored, maintaining integrity and consistency in the data flow.

2. Evaluation system and score calculation

The rating system, designed to ensure the reliability and accuracy of the results, assigns a predefined rating value (between 1 and 4) based on the users' responses, where the value:

- 1 corresponds to the basic level of competence management
- 2 corresponds to the intermediate level of competence management
- 3 corresponds to the advanced level of competence management
- 4 corresponds to the highly specialized level of competence management

These values are aggregated and analyzed to determine an overall score for the specific skill, providing a complete and accurate view of the skill level.

The assessment methodology adopted captures both the depth and breadth of expertise.

This approach ensures that each dimension of the competency is adequately assessed, preventing a single competency area from disproportionately impacting the overall result. Aggregate scores are used to calculate both cumulative ratings (the total sum of responses) and mean ratings (the average of scores across all competency questions). This dual approach allows for an overall assessment that takes into account all relevant aspects of the competency, without neglecting any detail.

To ensure accuracy and reliability, each skill is assessed through multiple related questions, thus reducing bias resulting from individual responses.

The model validates the consistency of the assessment, ensuring that outliers or inconsistencies are flagged for further review.

3. Assigning the level of competence

Once the scores have been aggregated and analyzed, the model moves to the skill level assignment phase, which occurs through two complementary approaches: aggregate scores and average rating.

In particular:

- **Aggregate scores**

  The system collects individual ratings for each question and adds them together to obtain an overall score. This score reflects the overall level of competence demonstrated by the user, taking into account all areas of the competence. The summation ensures that all dimensions of the competence are considered, without a single question excessively influencing the final score. The summation of all the answers allows the system to have a holistic view of the competence, avoiding distortions that could arise from single answers.

- **Average rating:**

  In addition to the sum of the scores, the system also calculates the average rating of the answers for each skill, averaging the scores obtained on all the questions.

  The average rating plays a crucial role in providing a more balanced view of the user's competence. It ensures that the overall rating is not influenced by extreme values (both high and low), reducing the risk of distortions resulting from particularly excellent or insufficient responses.

  The average provides a balanced view that takes into account strengths and areas for improvement, allowing you to get an accurate picture of your overall capabilities.

  The average rating also helps to ensure consistency control, monitoring that the user's performance is stable and consistent across the different questions, preventing the system from relying on an exceptionally high or low answer that does not reflect the real level of competence. Furthermore, this granularity allows the system to produce personalized training recommendations based on a finer and more detailed assessment of the skills, addressing training interventions precisely.

The cumulative score formula

The cumulative score formula represents the initial process of aggregating the answers provided by the user for each of the questions related to the specific skill being assessed. The cumulative score is obtained by adding the individual ratings, each of which is expressed with a value ranging from 1 to 4, where 1

represents a low rating and 4 a high rating. The total sum of these ratings provides the overall score, which reflects the level of competence demonstrated by the user with respect to the questions submitted.

Adding together all individual responses allows us to determine an overall level of competence, which represents the user's performance across all the assessment areas analyzed.

The sum of the answers helps to visualize, in a quantified way, the overall level of competence of the user with respect to a given skill.

The average score formula

The average score is calculated to obtain a more balanced and uniform assessment of the skills, considering not only the sum of the answers, but also the total number of questions.

This approach helps mitigate the impact of any outliers (very high or very low) that might distort the overall competency assessment.

The average score provides a more accurate and consistent view of the user's abilities, reflecting the general trend of their answers and offering a clear and precise assessment, useful for guiding training recommendations. Averaging the answers helps to prevent a particularly low or high answer from excessively influencing the final score, ensuring that the result represents the actual skills more fairly.

In this way, the analysis provides a balanced measure of areas of strength and weakness, supporting the design of personalized and targeted training paths for each student.

The integrated approach, which combines sum and average, offers both an overall vision and a more in-depth reading of specific areas of expertise, improving the quality of the training process and contributing to the continuous improvement of human resources within HEIs.

Furthermore, this calculation methodology is perfectly suited to a dynamic and personalized learning context, where artificial intelligence can analyze data and suggest proactive training solutions.

Thanks to the personalization of training paths, HEIs can face the challenges of the future with a workforce prepared and ready to respond to the rapid evolutions of the global market.

Determining the levels of competence

Once the total and average scores of the assessments have been calculated, these are mapped onto the predefined competence levels using well-defined reference thresholds.

The entire mapping process is based on a clear and transparent criterion that allows each user to be placed in one of the following levels of competence, so that it is possible to have a precise and measurable vision of their abilities, as well as the areas that need improvement and development. The mapping of the levels of competence is structured as follows:

- **Base (1-25 points):** the individual demonstrates a basic understanding of the skill in question, but has considerable room for improvement. The skills acquired are still very preliminary and require considerable development to reach an adequate level of functionality. Users in this range require intense and targeted training support to become familiar with the fundamental aspects of the skill, understanding the main concepts and basic applications. This level represents the starting point of the learning and development path.

- **Intermediate (26-50 points):** the individual has reached a level of functional competence. Although the individual has a working understanding of the competence, there is still significant room for improvement. This level reflects an ability to apply the competence in practical situations, but with room for growth in both quality and breadth. The individual is ready to tackle more complex tasks and requires training and support to both consolidate acquired skills and deepen advanced knowledge.

- **Advanced (51-75 points):** The individual has excellent application skills, demonstrating solid expertise in real-world scenarios, and is able to solve complex problems with in-depth understanding of the subject matter, performing high-quality tasks in various work contexts. He or she is able to operate autonomously and tackle more challenging situations with a good level of independence. However,

even at this stage there are opportunities to further refine skills and tackle more complex and innovative scenarios. Training for an advanced user focuses on refinement, leadership, and innovation.

- **Specialized (76-100 points):** the individual has a total mastery of the competence. Users in this range are considered experts, with the ability to apply the skills acquired in complex and innovative contexts, anticipating future needs and contributing significantly to the development and improvement of business processes. Their experience is broad and consolidated, and they are able to solve complex problems with creative and strategic solutions. At this level, users are ready to become leaders and share their expertise with other team members, playing key roles in innovation and business strategy.

Each level of proficiency is accompanied by a detailed description that outlines the skills and abilities expected for each level.

This description serves as a clear guide for the user, helping them to better understand their current position, the type of skills they possess, and areas for improvement.

The competency descriptions for each level provide a comprehensive view of the required skills, expected behaviors, and practical applications of the competencies, making the assessment and development process highly transparent and action-oriented.

Additionally, each skill level provides an overview of development opportunities that could be undertaken for continuous improvement. This approach helps users not only understand where they are in their learning journey, but also clearly plan next steps to advance to the next level, fostering a continuous cycle of skill improvement and adaptation to market challenges.

Skills mapping not only provides a clear view of each individual's current position, but also serves as a strategic tool for human resources management. Thanks to this methodology, HEIs can make accurate assessments of their student' skills and identify in a timely manner the areas that require targeted training interventions. Furthermore, mapping allows to align training with business strategies, ensuring that human resources development is always in tune with the emerging needs of the organization and with the transformations of the global context.

Finally, the competency mapping process supports a corporate culture oriented towards continuous learning, where each student has the opportunity to constantly evolve, overcoming their own challenges and adapting to new business and technological dynamics. In this way, the SMILE model allows not only to improve individual skills, but also to enhance the overall resilience of the organization, preparing it to successfully face future challenges.

The evaluations of the individual questions

A distinctive and highly strategic aspect of the SMILE model is its ability to maintain assessments at the level of a single question, going beyond the overall aggregation of scores. This approach provides a much more detailed and granular analysis of individual skills, allowing for a complete and precise picture of the areas in which each user excels and those in which, instead, they need improvement.

The resulting in-depth study is essential to ensure a targeted training path, adapted to the specific and constantly evolving needs of the individual and the organization.

By maintaining and saving the ratings of individual questions, the SMILE model is able to provide valuable information that allows you to:

- **Identify strengths and weaknesses within a specific skill**
  With visibility into the ratings for each question, the system allows you to map in detail where an student excels against the required skills, as well as areas that need development. For example, if an student scored highly on "time management" but lower on "task prioritization," this could indicate the need for training interventions focused on the ability to manage priorities. In another example, a strong score on "interpersonal communication" but weak on "public speaking" could suggest the opportunity to implement targeted training activities to develop that skill in public settings. In this way, the proposed

training not only addresses immediate gaps, but also aims to strengthen areas of excellence to further optimize overall performance.

- **Enable accurate tracking of progress over time**
  The ability to track individual responses to each question provides a dynamic and ongoing view of skill development.
  The platform can monitor specific progress over time, clearly highlighting improvements achieved after targeted training interventions and comparing current performance with previous ones. This approach allows for assessments and adaptation of the training plan to emerging needs, improving the effectiveness of invested resources and optimizing learning times.
  For example, if an student scores higher in the relevant section after targeted training on "persuasive communication," this will confirm the effectiveness of the training intervention. Likewise, monitoring specific skills can also reveal areas where interventions may need to be adjusted or an alternative training approach.

Maintaining assessments at the individual question level allows the SMILE model to further personalize the learning path for each student.

This granular, detailed approach not only helps identify areas for improvement but also maximize strengths. The personalization of the training process, based on specific assessments, makes the training intervention highly relevant and immediately applicable to the actual needs of users.

In practice, the model provides HEIs with a tool that allows them to minimize waste related to generic training courses, focusing exactly on the skills that need to be developed.

Furthermore, continuous feedback from individual application evaluations allows HR functions to accurately monitor overall skill performance.

This continuous monitoring guarantees an always updated vision and allows to adapt the corporate training policies to the technological, organizational and market evolutions. In this way, the SMILE model creates a virtuous cycle of continuous learning, in which each step of the individual is monitored, supported and optimized through personalized training resources.

Personalized Training Recommendations

The recommendation system of the "TaiLENT" platform connects the level of competence assigned to the user as a result of the results of the Self-Assessments and/or Interviews/conversations carried out, to the most relevant and specific educational resources for each area of competence.

Each skill is associated with a large repertoire of training resources.

These resources come from training repositories that have been carefully selected by the project partners, ensuring that the recommendations are in line with the European reference frameworks and the six key competences identified for the development of HEIs.

The recommendation algorithm is based on the user's skill level to precisely and specifically select the most suitable learning materials. Each self- or other evaluation made by the user is used to generate targeted and personalized training suggestions that reflect the specific skill development needs of the individual. For example:

- **Low ratings** (beginning or basic levels) will activate suggestions for introductory level training resources, to fill gaps in basic skills.
- **High ratings** (advanced levels) will instead suggest advanced resources, with the aim of further refining the skills acquired and supporting the user in continuing his professional development path.

Educational resources are available in both English and the national languages of users, thus ensuring better accessibility and greater understanding of the content by an international and multilingual audience.

Recommendations are highly personalized, as they are generated based on specific skill gaps identified for each user.

This approach allows you to optimize the training process, ensuring that users receive training content exactly in line with the areas in which they need improvement, thus promoting targeted and effective learning.

REST API for Skills Assessment and Recommendation System

The SMILE model and the related "TaiLENT" platform, for the assessment of skills and the recommendation system, use the REST (Representational State Transfer) API interface, which allows communication between computer systems through HTTP requests.

In other words, a REST API is a set of guidelines on how to design an interface to allow different applications to interact with each other, transmitting and receiving data in a standardized and efficient way. APIs (Application Programming Interfaces) are mechanisms that allow different software to "talk" to each other. An API is a contract that establishes how an application (called a "client") can request services or data from another application (called a "server"). APIs are tools that facilitate access to resources and data by users, while maintaining control over how and who can access them, thus ensuring security and management of access rights.

REST APIs work via HTTP requests that carry information between clients and servers.

Once the request is received, the server returns a response containing the requested data (or an error message, if something went wrong).

To be considered RESTful, an API must follow some guidelines:

- **Stateless**: each request is independent of the others. No information is retained between requests, making each interaction autonomous.
- **Resource identification**: each element of the system (for example, a product or a user) must be identifiable through a URI (Uniform Resource Identifier).
- **Self-descriptive messages**: Each API response must include information that explains how to interpret and use the returned data.
- **HATEOAS (Hypermedia as the Engine of Application State)**: A resource should provide links to other available actions, allowing the client to dynamically explore the system.

Adopting a REST API has several advantages, including:

1. **Simplicity and efficiency**: Unlike other more complex technologies, REST is a set of guidelines that are easy to implement and understand, reducing complexity in design and use.
2. **Scalability and performance**: Due to its stateless nature, the REST API can handle a large number of requests simultaneously, making it ideal for large-scale applications or systems like the Internet of Things (IoT).
3. **Flexibility**: Not being tied to a specific protocol like SOAP (Simple Object Access Protocol), REST can be implemented with different technologies, such as JSON or XML, and can easily integrate with other systems, making it particularly useful for modern web applications and for managing mobile services.
4. **Mobile Compatibility**: They are particularly suitable for supporting mobile devices, as they allow for lightweight and fast data transmission, which is necessary for applications operating in resource-limited environments.
5. **Interoperability**: The ability to interact via JSON and HTTP standards allows the system to be compatible with different platforms and applications, increasing the possibilities of implementation in various business contexts.

A REST API is a powerful and flexible tool that allows applications to interact with data and resources in a standardized and highly efficient way.

In the context of the SMILE model, the API handles the following main operations:

- **Skills assessment**:
  - Users fill out self-assessment questionnaires through the dedicated interface created on the platform. Once completed, the data is sent to the REST API in JSON format

- The API, using the default assessment model, calculates the overall and average score for each skill by aggregating the answers. The answers are then mapped to the predefined skill levels (Basic, Intermediate, Advanced, Specialized) and the result is returned to the client in JSON format.
- The API also allows you to return more detailed information about individual answers, to provide an in-depth assessment. This includes the score for each individual question and an analysis that highlights the skills to strengthen or improve.
- **Training recommendation system:**
  - The REST API provides personalized recommendations for each user, capable of filling the skills gaps that emerged from the assessments carried out, offering training video pills, video tutorials, narrative branching scenarios, edu-games, case studies and other educational resources.
  - The API can respond to the development needs of skills related to digital, green, entrepreneurial and specific soft/hard skills, ensuring that each training response is tailored to each student.
  - The recommendation API is activated based on the data sent by the client, returning a list of educational contents sorted by relevance to the detected skill gap.

Scalability and Continuous Improvement of the SMILE Model

The SMILE model, integrated with the TaiLENT platform, is designed to effectively and continuously respond to the training challenges of SMEs, ensuring scalability that allows the seamless integration of new skills and the constant updating of training recommendations in line with the evolution of the market and global trends.

Scalability ensures that as new skills are added or business needs change, the assessment system can easily expand, while maintaining consistency and effectiveness in recommendations. This allows HEIs to be constantly aligned with emerging training needs, which not only address current gaps, but also prepare in advance for future challenges related to technology, sustainability and internationalization.

Example of application in the context of a skills assessment

Let's imagine that a student is being evaluated on his/her Communication skills.

Following the administration of a structured questionnaire, the platform collects the responses and calculates the cumulative and average score:

- **Questions and ratings**:
  - "How effectively do you express ideas in a team context?" → Rating: 4/4
  - "Do you adapt your communication style to different audiences?" → Rating: 3/4
  - "How often do you seek feedback to improve communication?" → Rating: 2/4
- **Cumulative score:** $4 + 3 + 2 = 9$
- **Average score**: $9 / 3 = 3.0$

With these assessments, the system classifies the user in the intermediate level of competence, indicating that, although he or she has good skills in group communication, there are areas to develop, such as adapting the style to the audience and seeking feedback.

Once the level of competence is determined, the system generates personalized training recommendations to help the user improve his/her communication performance.

For example, if your score is low in the feedback search, the platform suggests specific courses that address this area, such as:

- **Assertive communication courses**.
- **Constructive Feedback Exercises**.
- **Webinars and case studies** on improving feedback and adapting the message to the audience.

The recommendations are not limited to these contents, but also include a long-term development plan, based on emerging skills, such as technology management and sustainability, which are crucial for the future of the market and HEIs.

In relation to the skills related to specific soft / hard skills, in addition to the training recommendations, the platform provides an in-depth description of the capabilities that a student should have at each skill level.

For example, for an intermediate level of communication, the following might be stated:

"The user has a solid understanding of the dynamics of communication, but for significant growth, it would be useful to develop advanced skills in adapting the message to different types of audiences and in valuing the feedback received. The user should focus on creating measurable communication objectives and using the right tools to monitor the effectiveness of communication actions."

To encourage continuous improvement, the platform suggests training activities such as:

1. Deepen your understanding of current customer characteristics to refine your communications with your audience.
2. Create clearer, more measurable communication goals to optimize effectiveness.
3. Learn to enhance brand resources, aligning them with customer expectations.
4. Strengthen the ability to coordinate internal and external collaborators for more fluid and integrated communication.
5. Explore the use of analytics tools to monitor the effectiveness of communications efforts and proactively adapt strategies.

The reporting system

The reporting system provides users with detailed feedback on the results of their assessments. This report summarizes the most relevant information, allowing users to get a clear and understandable overview of their competence status and the areas they should focus on for improvement.

In particular, the reporting system is able to provide:

- an in-depth analysis of the user's skill level based on the scores obtained, with a clear description of the skills and competences related to the assigned level;
- a summary of the scores obtained in relation to the questions assessed, which helps to monitor progress and evaluate the user's overall performance;
- evidence of specific suggestions recommended for the overall development of skills, based on the scores obtained and the gaps identified;
- evidence for each question of recommended suggestions aimed at addressing the identified areas of weakness and helping the user to strengthen their skills.

The report generated by the system allows you to easily understand the position of each user, allowing you to make informed decisions on how to improve your skills.