SKIPPER
SKILLS PORTFOLIO OF PERSONAL DEVELOPMENT

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WP2 Research Report

Background research and development of supporting materials

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EXECUTIVE SUMMARY

This research report is the first output of the Erasmus+ project Skills Portfolio of Personal Development (SKIPPER). The project aims to create a skills portfolio passport for higher education students in Europe, recognising skills developed through curricular and extracurricular activities. The SKIPPER project has four objectives, including assessing the gap between university-developed competencies and labour market expectations, establishing a Skills Matrix, developing a Skills Portfolio, and devising a Skills Passport.

This research report serves three objectives: identifying relevant skills, conducting a literature review on skills gaps, and proposing an assessment matrix and prototype of an app passport. The report also summarizes findings from focus groups with students and provides chapters on country introductions, methodology, literature review, matrix and passport prototype, and focus group findings.

First, the literature review focused on various sources, including institutions like the European Union and CEDEFOP, desk research on student/graduate competencies and labour market requirements, previous Erasmus+ projects, and scientific literature. The review resulted in a short list of skills and competencies, which were further categorized into 10 main categories and 31 sub-categories. The 10 main categories are: flexibility, leadership and organizational category, personal, decision making, ways to create, collaboration, networking and communication, thinking, values, digital category.

Second, eight focus groups in Hungary, Poland and Slovenia that in total included 54 participants listed mainly learning paths for the next categories: Collaboration, Decisions, Digital skills, Flexible, Network + Communication, Personal, Thinking, Values, Ways to create. The proposed learning paths varied from developing categories through experiences in sports and dealing with inconveniences and changes in schedule, acquired through participation in several different organizations, through various means such as games, travel, student jobs and some were associated with artistic endeavours and even watching tutorials on YouTube.

Third, participant of the focus groups advised that an app that could track level of skills shall have skills-tracking features of the app but have concerns about self-assessment bias and validation. They want a career-oriented and user-friendly app that promotes self-improvement and provides personalized feedback. Users also expect detailed skills analysis, CV integration, chatbot features, and a job matching system. Engagement features like achievement badges and social media integration are also desired.

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INTRODUCTION

This Research report is the first intellectual output of the Erasmus+ project Skills Portfolio of Personal Development (SKIPPER). The aim of the project is to create a skills portfolio passport in the form of diploma supplement for higher education students in Europe that will contain and recognize skills developed with both curricular and extracurricular activities. In order to achieve this aim, the first intellectual work package (WP2 in the project) “Background research and development of supporting materials” was intended to provide a valuable and necessary input for the other two intellectual work packages (WP3 and WP4).

There are four participating countries in the project: Hungary, the Netherlands, Poland and Slovenia with five participating institutions: University of Pannonia (coordinator, Hungary), Wrocław University of Economics and Business (Poland), Menat BV. (the Netherlands), Learning Innovation (Hungary), University of Ljubljana (Slovenia). Although all participating countries are European Union member states and with the Bologna reform harmonized education systems, they can differ with respect to curriculums and focuses on specific skills development. In addition, the countries differ with respect to education and training investments and policies and labour market conditions, including the employment and unemployment rate, job vacancies and demand for specific skills (see Chapter 1). Therefore, the inclusion of four countries will result in more comprehensive understanding and will offer comparative analysis as well.

The SKIPPER project has 4 objectives:

1. Assessing the gap between the competencies/skills developed by higher education institutions and the skills expectations of the labour market.
2. Establishing a Skills Matrix containing the key skills required from graduates, identified by desk research and stakeholder feedback.
3. Developing a Skills Portfolio, a gamified digital tool incorporating curricular and extra-curricular learning pathways that contribute to students' skills development
4. Devising a Skills Passport based on the Skills Portfolio, serving as a diploma supplement to graduates, providing an objective depiction of their skills.

The Research report has three objectives. First it identifies the relevant skills developed by higher education institutions and with extracurricular activities of students and the skills expectations of the labour market. This was done by extensive and systematic literature review conducted by all participating partners and the process is described in Chapter 2. Since during the literature review, the partners identified different skills, knowledge, abilities and attitudes as well as already competences and since all are of particular importance on the labour market, the SKIPPER project names these all together as categories. Therefore, this Research report introduces the term that is going to be used in the project consistently. The categories identified were: **flexibility, leadership and organization, personal development,**

decision making, ways to create, collaboration, communication and networking, thinking and reasoning, integrity, digital proficiency[1].

Second, this Research report provides i) a description of each category and provides ii) a short literature review on the identified gaps between category and the demands on the labour market, iii) possible measurements and iv) learning paths to get/develop that category. The literature review is organised by categories, however some sub-categories refer to competencies which are combination of knowledge, skills, abilities, and attitudes that enable individuals to perform tasks or activities effectively in a specific context or domain.

Third, the Research report proposes a categories' assessment matrix that in order to assess and evaluate particular category. The matrix proposes sub-categories (three to four of each category) with statements at three different levels (that mimic EQF levels and requirements). In addition it proposes a prototype of a SKIPPER Passport that could visualize format and content would be welcome by students and accepted by the labour market.

Forth, the Research report summarizes findings of eight focus groups conducted with students in Hungary, Poland and Slovenia in May and June 2023. The purpose was to discuss the possible learning paths of particular categories and to get feedback on the proposed prototype of a SKIPPER Passport.

This research report is structured as follows. The first chapter introduces the countries participating in the project in terms of skills mismatches and skills requirements and highlights the needs of this project (needs analysis). The second chapter describes the methodology for desk research conducted in order to identify the list of relevant categories and the procedure for the identification of the short list of categories. The third chapter provides a short literature review on each category. The fourth chapter presents the matrix and the prototype of the SKIPPER passport. The fifth chapter provides findings from the focus groups.

1. NEEDS ANALYSIS

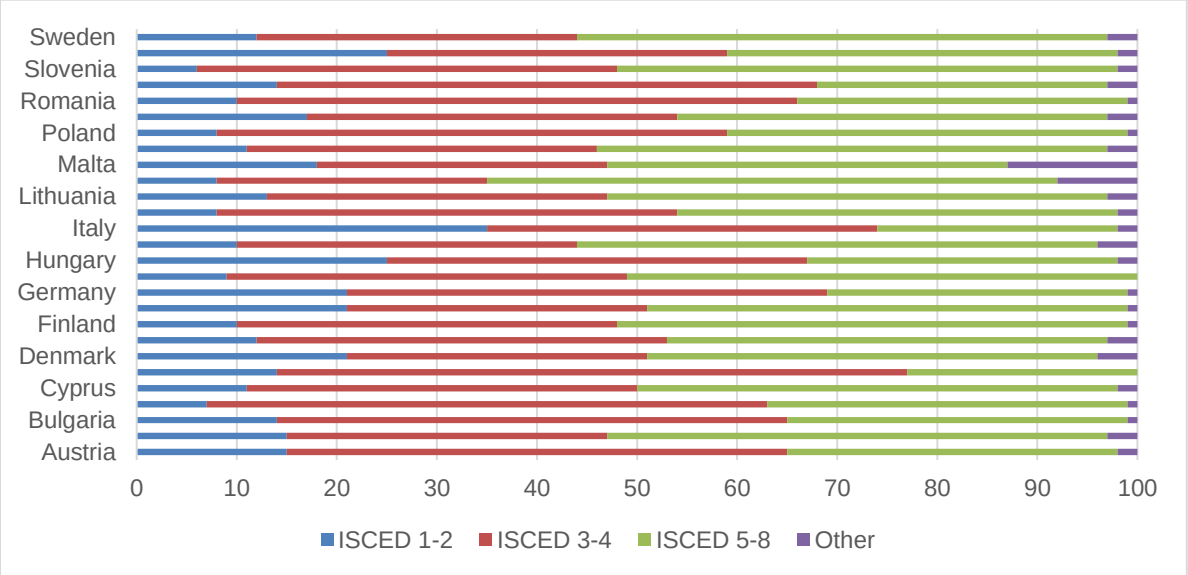
Investigation of skills development, skills activation and skills matching is important from micro (individual) and national (macro) view. Such investigation provides a foundation for self-awareness, career planning, professional growth, and effective teamwork. It empowers individuals to make informed decisions, bridge skill gaps, and pursue opportunities for personal and professional advancement. From the macro view investigation on skills is important in order to support effective workforce planning, economic competitiveness, education and training policies, labour market regulations, social inclusion policies, and evidence-based policymaking. It enables governments to address skill gaps, enhance the employability of their citizens, and drive sustainable economic and social development.

However, the European Union countries differ with respect to the qualifications needed for a job. Based on CEDEFOP European skills and jobs survey conducted in 2022, about half of

[1] The categories were slightly changed due to the review received and in order to further align with the existing terminology.

the jobs require tertiary education in the Netherlands (51 %) and Slovenia (50 %), whereas in Poland 40 per cent and in Hungary 31 % (see Figure 1).

Figure 1: Qualification needed for job, 2022



Source: CEDEFOP (2023).

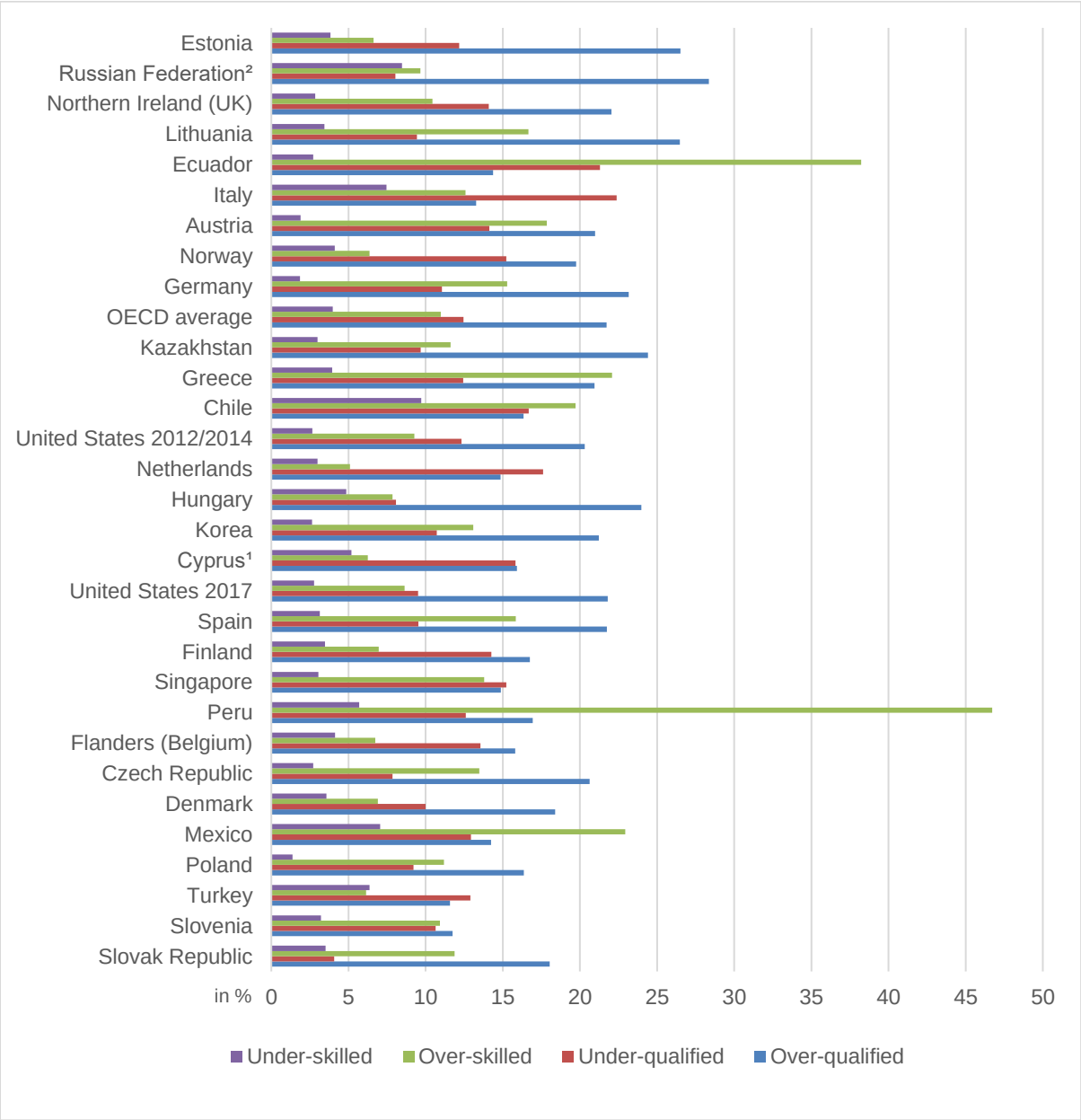
However, technological advancements (for example automation, digitalisation and artificial intelligence) have changed the skills needs and requirements on the labour market. Although educational institutions tried to adapt to the changing needs of the labour market, they were often outpaced by the technological change which resulted in the skills gap and mismatch of skills possessed by the individuals (the labour force) and the need on the labour market. There are of course others trends that contributed to the increasing skills mismatch on the labour market. For example, aging population where generational shifts can bring differences in skill preferences and expectations. In addition, globalization has increased competition in the labour market, requiring workers to possess internationally relevant skills. Changes in global supply chains and market dynamics can create skill gaps as companies seek employees with cross-cultural competencies and foreign language proficiencies, especially in countries that more heavily rely on international trade.

On the other hand, the number of available jobs in a particular field or industry can be less of the supply resulting in overqualification, especially in highly competitive sectors or during periods of economic downturn. With increased educational attainment in European Union, the incidence of overqualification has arisen as well. As OECD stresses ensuring a good match at the aggregate level between the skills acquired in education and on the job and those required in the labour market is essential if countries as well as individuals want to make the most of their investments in human capital and in turn increase the productivity (OECD, 2019). Figure 2 present the extent of three different types of mismatches: qualification mismatches and in particular over-qualification (workers' educational attainment levels are higher than required for their jobs) and under-qualification (workers' educational attainment levels are higher than required for their jobs), skills mismatches and in particular over-skilled (skills levels

that are higher than required for their jobs) and under-skilled (skills levels that are higher than required for their jobs).

For example, the share of over-qualified in Slovenia (11.75%), the Netherlands (14.85%) and Poland (16.37%) is below OECD average (21.73%), whereas the share of over-qualified in Hungary exceeds the OECD average (23.99%). However, the over-skilled in Hungary account to 7.9 percent, below OECD average of 10.99 percent. The share of under-skilled is much lower in the OECD countries (3.98 %) as well as in Poland (1.38 %), Slovenia (3.21 %) and the Netherlands (3%). In Hungary, again exceeds the OECD average and accounts to 4.86 percent.

Figure 2: Percentage of mismatched workers, by type of mismatch

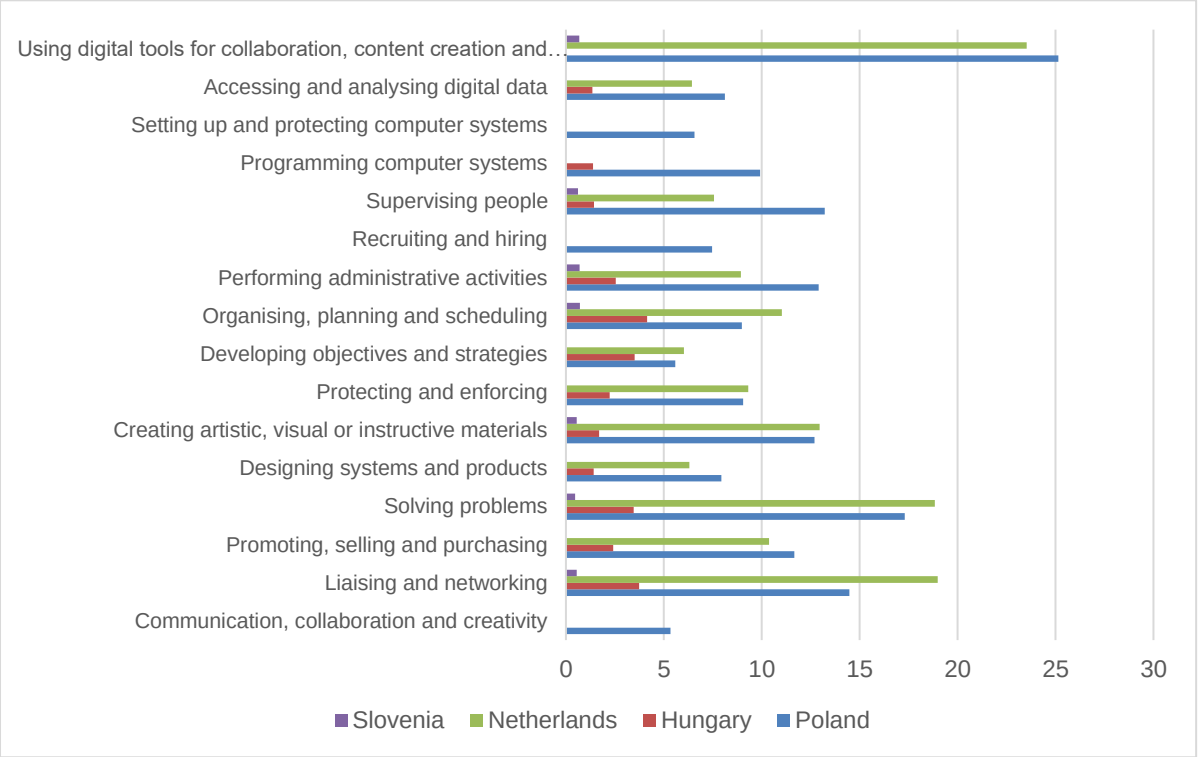


Source: OECD (2019).

In order to address skills mismatches and the changing needs of the labour market in 2016 the European Commission launched European Skills Agenda as a five-year plan to help individuals and businesses develop more and better skills and to put them to use. One important focus of the European Skills Agenda are actions to ensure that people have the right skills for jobs. In 2020 a European Skills Agenda for Sustainable Competitiveness, Social Fairness And Resilience was adopted where mapping of each individual's skill set, delivering targeted training which meets specific up- and reskilling needs, and helping the individual find a job in demand on the labour market. In addition, the European Skills Agenda highlighted the importance of the development of skills for jobs based on sound skills intelligence and modern and dynamic education and training provision that links directly with labour market and societal needs as well as to empower people to build up their skills by developing innovative tools, making learning pathways more flexible and accessible.

In order to shed some light on the skill needs CEDEFOP based on European skills and jobs survey also reports most requested skills in job ads in 2022 which are presented in Table 3. Especially in the Netherlands and in Poland using digital tools for collaboration, content creation and problem solving was the most requested (out of measured) skills, followed by solving problems and liaising and networking. In Hungary and especially in Slovenia the share of online job ads that included measured skill requested is much lower, however again in Hungary, the most requested skills in online jobs in 2022 were using digital tools for collaboration, content creation and problem solving followed by organising, planning and scheduling. The later was the most requested skill in job ads in 2022 also in Slovenia.

Figure 3: Most requested skills in online job ads in Netherlands in Skills in 2022



Source: CEDEFOP (2023).

In **Hungary**, the skill-based education is still lagging behind the Western-European practice. Recent studies show that the average problem solving, critical thinking and social skills are weak in the population between the ages of 18 and 35. Also there is a growing demand in networking and IT skills that are traditionally low in Hungary despite the fact that there are several successful start-ups based in the Budapest area. The problem of shifting the higher education's focus from lexical and fact-based education to competence development is still making changes difficult, particularly when the Hungarian higher educational sphere is undergoing the deepest reform in history, changing the financial and control bodies and structure.

The Netherlands, known for its strong education system and highly skilled workforce, also faces challenges related to skill gaps. The main reason for skills shortage is that the expected inflow of graduates is too low to meet the demand of the labour market. Educational institutions, employers, employees, the so-called Top-Sectors, and regional and central government have agreed on a national Technology Pact in order to find ways to satisfy the need for (highly skilled) technologists on the Dutch labour market (CEDEFOP, 2016). However, The Netherlands ranks among the top of EU countries with the largest share of inhabitants who are proficient in using the internet, computers and software (digital skills) (CBS, 2022).

Poland is one of the leading European countries in terms of the level of education of its inhabitants. The share of people aged 25-64 who completed at least secondary education was 93.2% in 2020, with the average of 79.0% for European Union countries (Statistics Poland, 2021). However, employers keep talking about the mismatch between the competences of school graduates and current needs. According to the results of employer research, it is possible to indicate competences that are important regardless of the position or profession (Narodowe Centrum Badań i Rozwoju, 2019, Polska Agencja Rozwoju Przedsiębiorczości, 2022). These are: teamwork, willingness to learn, communicativeness, creativity and, above all, attitude towards work. For most employers, these "soft" skills are of key importance. Professional competences can be improved during work, but without openness to change and willingness to learn, this process is much more difficult. It is also worth emphasizing the need for competences resulting from technological and socio-economic changes (Jakóbczyk, 2023). Due to globalisation, digitalisation and demographic change Polish workplaces and society will need to the skills in order to accommodate the demand of the labor market (OECD, 2019). These include more well-rounded set of skills, including cognitive, social and emotional, and job-specific skills as well as people's skills.

Slovenia lacks a comprehensive and coordinated mechanism for anticipating skill needs. Various exercises take place, with a focus on skill assessment and anticipation, however are not coordinated and interconnected. In 2020, the Ministry of Labour, Family and Social Affairs and Equal Opportunities was engaged in revisiting the skills anticipation and matching infrastructure in the country, as part of the Career Platform project. The goal is implementing a set of comprehensive and coordinated activities supporting labour market outcomes and skill development. Several Competence Centres for Human Resources Development (KOC) programmes have been launched by the Slovene Human Resource Development and

Scholarship Fund to promote the delivery of adequate training and counselling activities to employees, based on the identification of training/skills needs. The lack of adequate employees or knowledge remains the most common problem in the digitalization of business operations in Slovenia. In the case of digital transformation, the use of technologies changes the company's operations and thereby helps to reduce costs, increase productivity, etc. 36% of companies with 10 or more employees and the self-employed (60% in 2021) faced a lack of adequate staff or knowledge (34% of small, 45% of medium-sized and 55% of large companies) (SORS, 2023).

The project caters to the needs of three important shareholders: students, companies and educational institutions. **Students** lack assessment of their skills and competences developed up until they enter the labour market. The SKIPPER therefore acts a tool to assess student skills and competences (categories) in order for students to gain a clear understanding of their strengths and areas for development, thereby fostering a more targeted approach to their personal and professional growth. Such assessments can pinpoint specific categories that are highly sought after by employers, ensuring that students can align their learning objectives with market demands. Additionally, a well-defined skills profile empowers students to effectively articulate their abilities in job applications and interviews, enhancing their employability.

When **companies** seek workers at the labour market, there is information asymmetry about skills and competences of potential candidates. SKIPPER can therefore act as a tool for companies as well by giving more information about the potential candidates and by that streamlining the recruitment process, reducing time and resources spent on identifying suitable candidates. Companies could match job requirements with a particular skill sets, ensuring a better fit between the employee's capabilities and the role's demands. This alignment increases the likelihood of higher job performance and employee retention, ultimately boosting organizational productivity. Furthermore, it allows companies to anticipate and invest in necessary training and development from the outset, fostering a workforce that is both skilled and adaptable to future industry shifts.

Moreover, skills assessments can serve as critical feedback mechanisms for **educational institutions**, enabling them to tailor curriculum and teaching methodologies to bridge any identified skill gaps. This alignment of academic offerings with the evolving needs of the workforce is essential for maintaining the relevance and rigor of educational programs. They ensure that the emergent workforce is adaptable, equipped with a robust skill set that includes not only field specific (and technical) expertise but also soft skills. Therefore, in the SKIPPER project the need to address and assess also categories such as personal development and integrity.

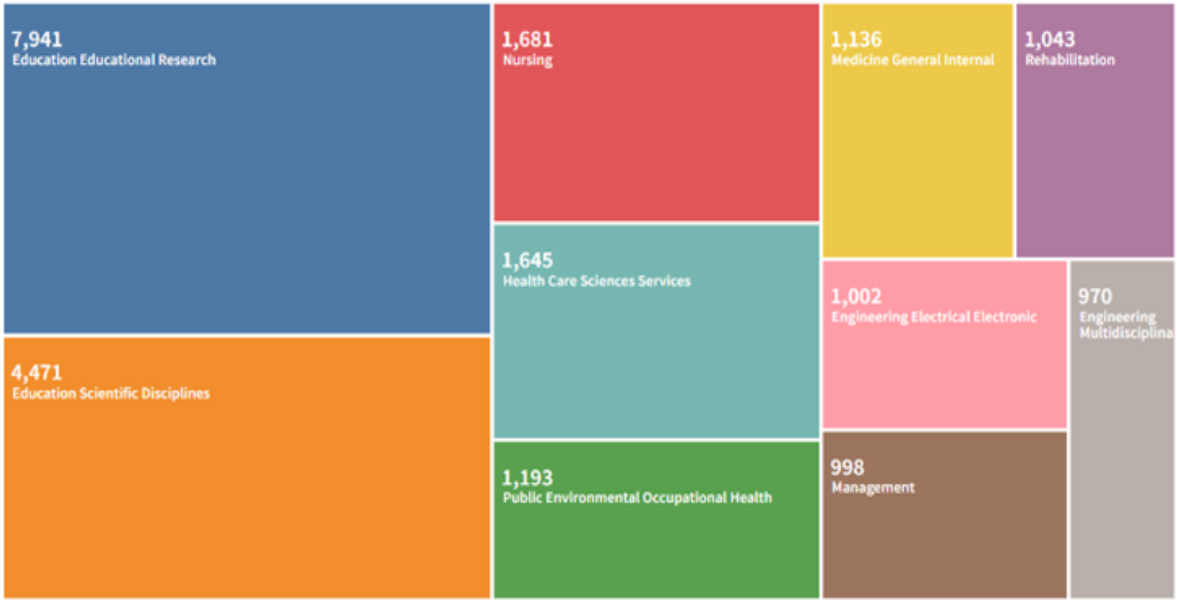
2. METHODOLOGY FOR IDENTIFICATION OF SKIPPER LIST OF CATEGORIES

Identification of the relevant skills and competencies that should be included in the SKIPPER Passport is one of the most important decisions in the project. Therefore, an extensive literature review was conducted by all participating partners with the focus on:

1. Competencies and skills recognized from institutions such as European Union, CEDEFOP, National Association of Colleagues and Employees, US Department of Education, World Economic Forum;
2. Desk research should focus on competencies and skills of students/graduates that are gained during and outside of the education process and what is required on the labour market. The objective is to find relevant review articles that identify skills and competences.
3. Competences and skills framework from projects previous Erasmus+ projects, projects partner institutions participated in and possible relevant national projects.
4. Scientific literature review based on papers included in Web of Science and focusing on competence demand and mismatch, gap analysis, needs analysis of target groups in the EU countries (especially, but not limited to partner countries), existing skill portfolios, best practices of companies and universities in the field of non-formal education and competence development, learning path development and measurement, competence models and similar.

The scientific literature review was done on February 4, 2023 by searching the Web of Science with the next particular phrase “graduate skills” (33,062 results), “skills gap” (19,225 results), “employability skills” (3,473 results). Results included many science categories and Figure 1 is as an example of results for graduate skills by science categories. In order to limit the literature review on the papers related to the project topic, review was limited to the next science categories; Education Educational Research, Education Scientific Disciplines, Management, Multidisciplinary Sciences, Social Sciences Interdisciplinary, Business, Economics, Industrial Relations Labour, Behavioural Sciences, Sociology. After the restriction on science categories, another restriction was made for the review articles and a narrower topics that include: Education Educational Research, Management, Education scientific disciplines, Industrial Relations Labor, Social Science Interdisciplinary, Business, Economics. This resulted in 36 paper on “graduate skills”, 127 results on “skills gap” and 35 results on “employability skills”.

Figure 4: Search results for "graduate skills" by science category



Source: Web of Science, February 4, 2023.

Based on the literature review conducted by each partner (and focusing on the 4 sources of data described above) provided a short list of possible skills and competencies that should be included in the project. Together, the partners provided 403 competence elements that were iterated in a multiple-round process. A revision of the list was conducted by each partner independently and at a partners' meeting. The list of all proposed skills and competencies was slotted into different categories of skills and competencies. For example, in the category "Thinking" there were skills and competencies included such as systematic thinking, critical thinking and problem solving, logical and critical thinking, IT skills (basic and advanced), analytical skills (problem solving, searching for information), entrepreneurship competencies, ability to apply theory into practice, applied academic skills.

The desk research also identified skills, knowledge, attitudes and abilities as well as some personal traits and already competences. Therefore, these all together are called categories in SKIPPER project. To note, a competence can be defined as a combination of knowledge, skills, abilities, and attitudes that enable individuals to perform tasks or activities effectively in a specific context or domain. Whereas, skills refer to specific learned abilities or expertise that enable individuals to perform specific tasks or activities. They are typically acquired through training, practice, and experience (OpenAI, 2023).

Categories were discussed and amended in order to arrive at 10 categories where each category would include 3 subcategories. A full agreement was reached for the next 10 categories: **flexibility, leadership and organisation, personal development, decision making, ways to create, collaboration, communication and networking, thinking and reasoning, integrity, digital proficiency.** The term category was used in order to acknowledge the inclusion of competencies and skills in each category. Figure 5 presents the ten categories and 30 sub-categories.

Figure 5: SKIPPER Categories and sub-categories

Category	Sub-category 1	Sub-category 2	Sub-category 3
Flexible	Flexibility	Adaptability	Resilience
Leadership and organisation	Leadership	Organisation (other-oriented)	Self-management
Personal	Learning skills	Self-reflection	Openness
Decision making	Decision-making skills	Independent working	Situational adaptability
Ways to create	Creativeness	Proactivness	Innovativeness
Collaboration	Teamworking	Working in a diverse team	Presenting and public speaking
Communication and networking	Assertive communication	Networking	Intercultural
Thinking and reasoning	Critical thinking	Problem solving	Analytic and logical thinking
Integrity	Responsible	Ethical	Trustworthy
Digital proficiency	Advanced computer handling	Collaborating in digital environment	Programming

For each of the categories and subcategories literature review included: definition, gaps, measurement tools as well as possible learning paths to develop categories. The notion of a "gap" in personal competencies typically refers to a discrepancy between the desired level of competence and the current level of competence an individual possesses. It suggests an area for improvement or development in one's skills, knowledge, attitudes, or behaviours. Measurement tools are tools that can assess the possession or level of one's skills, knowledge, attitudes, or behaviours in general may vary from self-assessment tools that are used by individuals to reflect on their skills, knowledge, attitudes, or behaviours and rate their proficiency in different areas. These tools often involve questionnaires as do also competency, knowledge, attitudes or behaviour-based Interviews where responses are evaluated against predefined competency criteria to determine the level of proficiency. Another measurement tool are behavioural observations, assessment centres, psychometric tests and portfolio assessment. The latter is of particular interest for the SKIPPER project since a portfolio assessment involves compiling evidence of an individual's work, projects, and achievements that demonstrate their competences. Portfolios can include documentation, reports, samples of work, certifications, or testimonials that showcase the individual's skills, knowledge, attitudes, or behaviours.

3. SKIPPER LIST OF CATEGORIES

3.1 FLEXIBILITY

Flexibility category consists of three sub-categories: flexibility, adaptability and resilience.

3.1.1 Flexibility

Based on the Cambridge Dictionary, the term flexibility refers to the ability to adjust to the current situation, to change rapidly (Cambridge Dictionary, 2023), construct many innovative ideas for the given circumstances and set new aims (Meintjes, 2015). Flexibility is a very significant skill in the 21st century in order to reflect on the dynamically changing environment. The skill encompasses many elements such as the speed and quality of the reflection and has an impact on the performance, both in the individual life as well as in the work life (Bhattacharya, Gibson, & Doty, 2005). Flexibility is connected to the thinking therefore many authors put emphasis on problem solving and flexible thinking, which contains open-mindedness, adaptation to the changes, adaptability to handle uncertainty as well as acceptance (Pulakos et al. 2000, Barak, & Levenberg, 2016):

- Adaptability: The ability to quickly adjust to new conditions, changes in the environment, or different ways of doing things.
- Open-mindedness: Being open to new ideas and willing to change pre-existing notions when given new information.
- Problem-solving: The ability to identify and implement new or unusual solutions when traditional ones do not work.
- Resilience: Being able to deal with setbacks, criticism, and rejection, and to bounce back quickly from them.
- Ability to handle uncertainty: This involves being comfortable with ambiguity and being able to make decisions without having all the details.

Sub-category gaps. To identify flexibility gaps, it's important to examine both personal and organizational aspects. On the personal level, there might be individuals who find it hard to adjust to change, sticking to the known rather than welcoming the new. This can also be seen in a resistance to new ideas, reflecting an inability to shift viewpoints when confronted with fresh information. Similarly, struggles with multitasking may indicate a lack of flexibility, as this skill requires managing multiple tasks or projects simultaneously. Moreover, individuals who find uncertainty difficult to handle or who are unable to make decisions in ambiguous circumstances may be revealing a gap in flexibility. Finally, those who do not show resilience, finding it tough to recover from setbacks, may also have a deficiency in flexibility (Armenakis, Bedeian, 1999).

Sub-category measurement. Various measurement tools highlight the close relationship between flexibility and adaptability. Martin and Rubin (1995) created a cognitive flexibility scale that includes "willingness to adjust to specific situations" as a key aspect. This scale also

covers elements such as recognizing alternative options in any given situation and having confidence in one's flexibility. However, it fails to incorporate two crucial components of contemporary flexible thinking: open-mindedness and acceptance of technology (Spiro et al., 2007; OECD, 2013). To address this, a more recent scale called I-ADAPT was developed by Ployhart and Bliese (2006) to assess and define adaptability. This scale measures how well individuals respond to changes in their environment. The researchers summarized adaptive performance into four main areas: dealing with stressful events, responding to organizational changes, selecting effective strategies, and task performance (Ployhart & Bliese, 2006). The I-ADAPT scale comprises eight dimensions: cultural, learning, creativity, crisis, work stress, physical, uncertainty, and interpersonal. In this study, relevant items from the I-ADAPT scale were included and slightly modified to reflect the third aspect of flexible thinking in the context of learning (Barak & Levenberg, 2016).

Learning paths. Based on the literature, flexibility is an essential skill, however at the same time it is complex that contributes to the adaptation, the speed of decisions in new situations or the open mindedness. Furthermore, the successful elaboration of the flexibility skill can contribute to personal success. According to the literature developing this skill can happen by experimentation in real context, by role play techniques (Englehardt & Simmons, 2002) by teamwork and project-based tasks which can results new hardly replicable skills (Beltrán-Martín & Roca-Puig, 2013). The dynamic new environment and heterogeneous collaborations can contribute to the improvement of personal flexibility. Flexibility can be learned with the help of different strategies which include new situations with the aim to trigger the individual's knowledge flow from a previous action to the new situation. The occurring barriers can hinder the skill of flexibility, so a flexible thinking is significant in order to get new perspectives and to create new ideas and strategies. That is why in order to develop the flexibility of someone coping with a mixture of tasks, new requirement adaptation to the new projects, individually and in a group can support the process (Meintjes, 2015).

3.1.2 Adaptability

Adaptability is a crucial trait that makes the individual able to cope with uncertain circumstances and demanding situations. Based on the literature, adaptability can be defined as the competency to control the understanding, the emotions and the attitude towards new, unknown situations (Martin, 2012). This includes the ability to adapt and cope with uncertain circumstances well, deal effectively with the emotions and behaviours related to the unfamiliar situations. Unpredictable events allow the individuals to remain open minded to the change with quick assessment of new complex circumstances in order to formulate appropriate responses. This support the flexibility and embracement of new ideas (Martin, 2017). Adaptability contains three distinct elements the „cognitive, behavioural and emotional dimensions". The cognitive element refers to the ability to realize the context, make own thought differently as usual and change one's mind. Behaviours recall the actions with the motivation to manage the encountered situation. Emotional dimension means limit the negative feelings by rising the positivity to hopefully face with the unpredictable events and challenges (Granziera, Colli, & Martin, 2019). This regulation process can support the achievement of the tasks (Tommaso, Sella, Meneghetti, & Cona, 2023).

Sub-category measurement. While the adaptability is becoming even more significant due to the changing global environment, it is necessary to take into consideration the measurement aspects. Adaptability is an essential skill in personal and business life to accept the nature of a changing environment, reflect adequately to it and create a balanced performance (Hamtiaux, Houssemand, & Vrignaud, 2013). Based on the work of Oprins, Bosch and Venrooij (2018), good predictors are the cognitive flexibility to solve the unpredictable events on a flexible manner, to understand what is happening and find suitable solution as well as personal traits are essential elements to measure the adaptability skills, which means one's open mindedness to the uncertain situations.

Learning paths. Based on the publications, it is clearly visible, there are many techniques to contribute to the development of adaptation skills. Adaptability can be improved by practicing at institutional context and from real life experiences (Oprins, Bosch & Venrooij, 2018). Scenario-based learning, role plays contribute to the development of adaptability by developing the skills of critical reflection, self-awareness (Granziera, Colli, & Martin, 2019). Important to train creativity, analytical thinking skills, learning skills by brainstorming, reframing, data analyzation, hypothesis creation, (Renzulli, 2020). According to the Yale University (2023), quick reflection to the changing environment is crucial and personal awareness is part of the adaptation process by noticing the roles, the responsibilities, the personal influence and what can be regulated.

3.1.2 Resilience

Resilience is a concept that is characterized by its dynamic nature (Rutter, 2013). Many definitions of resilience highlight its ability to overcome stress, adversity, or demonstrate relative resistance to environmental risks (Bowes & Jaffee, 2013). A broader perspective views resilience as the capacity of a dynamic system to withstand or recover from significant challenges that threaten its stability, viability, or development (Sapienza & Masten, 2011). Rutter (2006) used the term resilience to describe the phenomenon where certain individuals exhibit positive psychological outcomes despite experiencing risk factors that would typically lead to serious negative consequences. In essence, resilience involves the interaction between significant risk experiences and a relatively positive psychological outcome (Rutter, 2006). Resiliency can also be understood as protective or positive processes that mitigate negative outcomes in the face of risk (Greenberg, 2006).

Thanks to the systemic approach to resilience, the concept of resilience has been de-emphasised in the context of crisis management, which has made it possible to talk about resilience not only in specific life situations, but also in more generally, but also in relation to specific areas and groups (Patakfalvi-Czirják et al., 2018). This is how we can arrive at the concept of educational resilience (academic resilience), which focuses specifically on the ways in which individual success in educational settings can be achieved (Martin and Marsh, 2006, Kóródi, Szabó, 2019).

Starting from the concept of academic resilience, researchers propose to identify factors that may contribute to the disadvantaged pupils to achieve good academic performance. However, if we want to get a complete picture of an individual's resilience, it would be useful to assess

risk factors, positive adaptation and protective factors together (Tudor and Spray, 2017). In this interpretative framework, risk factors include those factors whose presence may lead to negative outcomes. Examples include low socioeconomic status or parental illness (Garmezy and Masten, 1986). Positive adaptation refers to the process whereby an individual's performance reaches or exceeds the level expected on the basis of the risk factors (Luthar et al., 2000). Protective factors represent the broadest set of variables measured, encompassing a range of factors that promote student achievement and balanced school performance (Kóródi, Szabó, 2019).

Sub-category gaps. Process-oriented research, while aiming for completeness, does not measure resilience directly, but rather infers the presence of resilience from the characteristics of students who perform well despite risk factors. In this approach, protective factors are treated as mediating factors. Research that focuses on individual characteristics uses group comparison methods to identify differences between resilient and non-resilient learners and to distinguish between resilient and non-resilient learners. and average-situated, successful students (Finn and Rock, 1997, Kóródi, Szabó, 2019).

Sub-category measurement. Several questionnaires have also been developed to measure academic resilience, but different definitions and operationalisation issues raise the question of whether the same construct is actually measured by the multiple instruments. As with theoretical frameworks, there is a tendency to confuse different concepts in the measurement instruments, most notably with regard to resilience and coping. The best-known measurement tools are linked to the research and concept of Martin and his colleagues (2008) (Kóródi, Szabó, 2019).

Skinner, Pitzer, and Steele (2013) developed the Multidimensional Measure of Coping questionnaire to examine adaptive and maladaptive coping strategies in a school situation. In the theoretical framework, they refer to the dynamics between commitment, emotional readiness, coping, and the subsequent renewed commitment as motivational resilience, where commitment serves as the resource that can assist the learner in adaptively coping with difficulties and returning to the task (Skinner and Pitzer, 2012). Due to the general nature of the situations presented in the questionnaire, it is suitable for assessing a wide age range (Kóródi, Szabó, 2019).

Learning paths. In the international literature, preventive and intervention programs most often aim to develop factors that directly influence resilience, such as problem-solving ability, the development of positive attitudes towards failures, learning and social skills, and they strive to reduce the emergence of risk factors (social-emotional problems, drug use, violence, etc.) (Silliman, 2004; Hart and Heaver, 2013). On the other hand, they also strive to strengthen protective factors on an individual level (e.g., self-assessment, goal-setting), social level (acceptance, development of social skills), and community level (e.g., increasing school attachment) (Tudor and Spray, 2017).

3.2 LEADERSHIP AND ORGANISATION

Leadership and organisation category consist of three sub-categories: leadership, organisation (other-oriented), self-management.

3.2.1 Leadership

One can find different definitions of *leadership*; Rost (1991) examined works spanning from 1900 to 1990 and discovered more than 200 different definitions for leadership. Definitions can be sorted by time periods. For example, in the first three decades of the 20th century leadership was defined in the context of control and centralisation of power with a common theme of domination. From the 1990s into the 21st century, leadership is seen as a process in which an individual has an impact over a group of individuals to achieve a common goal. This definition includes a process, influence, a group, and a common goal. Leadership being defined as a process highlights the importance of a transactional event between the leader and the followers, rather than a trait or characteristic that the leader possesses. Moreover, leadership does not exist without the leader exercising influence over the followers. Also, a group is needed for leadership to take place, while a common goal indicates that the leader and followers have a mutual purpose. Nonetheless, scholars agree that leadership is a complex concept, thus, it is challenging to find its common definition (Northouse, 2018).

Sub-category gaps. The leadership gap can be defined as how well-matched current leadership is with what is expected to be imperative for future leadership. The gap can stem either from an absence of expertise of the required abilities, or from a lack of focus on crucial competencies (Center for Creative Leadership, 2022). Analysis of the skill gap for business graduates from the banking industry in Pakistan examined gaps in mean scores on the skills expected by managers and possessed by graduates. For leadership skills, the mean for expected skills is 4.02, while the actual mean for observed skills is 3.31. Leadership is considered as an essential skill for graduates to obtain employment and to perform well (Abbasi et al., 2018). Deloitte (2016) discovered that leadership ranked as the second most important agenda among senior executives and HR leaders worldwide, after receiving more than 7,000 responses to their survey. The traditional pyramid-shaped leadership development model does not fulfil the demands of business and the pace of change. Thus, leaders are not produced fast enough. Only 7 percent of respondents reported that their firms have sped up leadership programs for Millennials, and almost a quarter of them have no leadership programs in place. More scientific and systematic ways for recognising, evaluating, and developing leaders are needed. This process needs to begin at the earlier stages of leaders' careers, including teaching senior leaders to undertake new roles to make way for younger leaders (Deloitte, 2016).

Sub-category measurement. There are several approaches to leadership, such as trait, skills, behavioural, situational, transformational, and adaptive approach. Each approach can be measured with the help of a questionnaire, skills inventory (the latter measures technical, human, and conceptual skills), or self-assessment. As an example, a leadership trait questionnaire includes statements regarding self-confidence, determination, and diligence (among others) and measures personal characteristics of leadership. It is completed by the

leader and five people that are familiar with the leader and the scoring rank offers insights into whether one has certain characteristics that are essential for leadership (Northouse, 2018).

Learning paths include participating in programs that teach leadership skills from a general self-help orientation. As there are several approaches to leadership various leadership development programs targeting specific approaches can be undertaken. As an example, skills inventory can represent a template for the design of leadership development programs. One first completes a questionnaire to assess its own behaviour and then uses the results to improve overall leadership behaviour. Moreover, path-goal theory examines how leaders motivate followers to achieve a common goal (Northouse, 2018). Phillips & Phillips (2016) developed an exercise that helps to understand the path-goal behaviours and offers practice modelling each behaviour by creating explicit sample statements for different leadership situations.

3.2.2 Organisation (other-oriented)

Organisation competencies are held by those who are able to work under pressure, to work independently and with attention to detail (García-Aracil & Van der Velden, 2008). Organisational skills are the ability to organise, plan, and prioritise tasks. Terminology used by the reviewed studies includes: ability to organise and plan, priority setting, ability to use and manage resources, time, money, materials, and human resources (García-Álvarez et al., 2022). Planning and organizing is the ability to collect, analyse and organize information (Osmani et al., 2017).

Sub-category gaps. The results provide strong support for the assumption that the match between individual human capital competencies and the characteristics of the job does matter. We observe that organizational competencies had a negative effect on income; this might indicate that these competencies are not rewarded in the first years of professional careers; but have a positive effect on job satisfaction (García-Aracil & Van der Velden, 2008).

As practitioners look for instructional approaches that offer flexibility, personalization, effectiveness and affordability, there has been a growing interest in innovative digital tools that can better facilitate personalized learning (Beetham & Sharpe, 2013). One innovation gaining recognition is Open Digital Badges (ODB), which are also known in higher education as micro-credentials (Denny, 2013; Garrick et al., 2017). However, ODB have the potential to realize learning roles beyond that of alternative credentials, becoming a disruptive innovation that can bring an alternative approach to learning that is more affordable, accessible and personalized in higher education (Randall et al., 2013). One way to expand their impact is to integrate goal setting with ODBs. It has been found that goal setting could significantly impact learning performance (Locke & Latham, 2002). Researchers foresee the potentials of using ODBs to facilitate student goal setting but have not provided much empirical evidence (Cheng et al., 2018, 2020).

Sub-category measurement. For example (García-Aracil & Van der Velden, 2008) asked graduates to indicate on an ordered scale ranking from 1 (not at all) to 5 (to a very great extent), the strength of a given competence (the acquired level of competence) at time of

graduation: working under pressure, accuracy, attention to detail, time management, working independently and power of concentration.

Learning paths. Digital badges have been used as an online representation for accomplishments, skills, or awards. According to Gibson et al. (2013), a digital badge is "a representation of an accomplishment, interest or affiliation that is visual, available online, and contains metadata including links that help explain the context meaning, process and result of an activity" (p. 405). Open digital badges are data rich digital badges that are sharable within an open network of organizations and individuals supported by an agreed open infrastructure (Grant, 2016). Initiated by Mozilla and the MacArthur foundation, the open infrastructure is a series of agreed upon standards that define how each badge should be created, what information the badge should contain, and how it should be stored and shared (Casilli & Hickey, 2016). Each badge is embedded with metadata that contains content about the target skills or knowledge, the criteria for accomplishing that skill or knowledge, and links to evidence showing why the badge was earned (Goligoski, 2012). Many researchers have argued that ODB are useful for goal setting in the field of education (e.g., Antin & Churchill, 2011; McDaniel & Fanfarelli, 2016; Randall et al., 2013). ODB could both support extrinsic goal setting and help realize intrinsic goals. Furthermore, they can structure the meeting of meaningful sub-goals as a way of managing the goal setting process (Cheng et al., 2018).

3.2.3 Self-management

Self and time management is the ability to organize oneself and one's time effectively (Azevedo et al., 2012). Time management can be defined as behaviours that aim to achieve an effective use of time whilst conducting certain goal-directed activities (Claessens et al., 2007). Self-management is the ability to organize oneself and the team, while time-management is the ability to organize one's (and team's) time effectively (Osmani et al., 2017). Self-management skills are the essential skills that allow graduates to manage themselves and to operate self-sufficiently in their professional and personal lives. It is a key dimension, as it allows graduates to adapt to the socio-professional world and to make decisions throughout their lives. It underscores the need for university graduates to approach employability for boundary less careers in the face of the complexity of the modern job market and social environment. It also highlights the importance of "professional identity", which is the way in which individuals are seen, and the way in which they see themselves, in social and professional settings. This dimension corresponds to a person's ability to learn to learn, and it is one of the weak points in the educational offerings of Higher education institutions, which could use their institutional policies to articulate experiences that show that learning is a continual, life-long path (García-Álvarez et al., 2022). Self-Management Skills are capacities used to effectively pursue goals and complete tasks (Soto et al., 2022).

Self-management skills include (García-Álvarez et al., 2022): problem-solving skills, flexibility and adaptability skills, analytical skills, life-long learning skills, critical thinking skills, information management skills, organisational skills, time management skills, decision-making skills, positive attitude and motivation, ability to apply theory into practice, ability to work independently, emotional intelligence, career management skills, multidisciplinary knowledge, multitasking.

Sub-category gaps. By examining the means and within-country rankings, it is possible to see that graduates consistently received the highest ratings in teamwork and relationship building, followed by self and time management and communication. While these three competencies were mentioned as among the most valuable and most relevant for business graduates, the mean values revealed a clear gap between what is required and the level of preparation of business graduates (Azevedo et al., 2012). Planning was identified to be an important aspect of time management; time management research on detailed aspects of planning such as prioritising and planning alternative tasks in case the original plan could not be executed (e.g. due to work interruptions or the unavailability of information) would have seemed logical, yet it appears that such research has not yet been done. Also, although some authors have suggested that good planners can be poor at managing time while performing their planned work (Eilam & Aharon, 2003), this topic has not been researched thoroughly. People might overestimate the time required to complete a task as a safe estimation strategy. Overestimating time may be a means of controlling time and avoiding stress because they allow enough time for tasks to be completed (Burt & Kemp, 1994).

Sub-category measurement. There can be several different measurements for measuring self-management. For example (Soto et al., 2022) instructed participants to rate how easy or hard it was for them to perform each behaviour well, on a 5-point difficulty scale ranging from 1 =very hard to 5 =very easy. Behaviour included self-management skills: Task management, responsibility management, organizational skills, time management, detail management, goal regulation, rule-following skill, decision-making skill, capacity for consistency.

Learning paths. Work-integrated programs (Ibrahim & Jaafar, 2017) and the training company (Edeling & Pilz, 2016), 3D simulation learning environment and digital games (Cela-Ranilla et al., 2014), good and well-organized teaching (Boahin & Hofman, 2013) and various active learning methods, such as project-based learning (Chiang & Lee, 2016), problem-based learning (Akcay, 2009), flipped classroom (Guo, 2019). Peer assessment, feedback, general study guidance, and portfolio (Li et al., 2019) or other reflection tasks (Ruge & Mccormack, 2017). Some studies showed that different kinds of work-integrated learning environments enhanced the learning of generic skills (Jackson, 2013).

3.3 PERSONAL DEVELOPMENT

There are three sub-categories in personal development category: learning skills, self-reflection, openness.

3.3.1 Learning skill

Learning skills correspond to openness to lifelong development, openness to constant development and easy adaptation to changes (Mentz, de Beer & Bailey, 2019). There are several key elements of learning skills – openness to development, learning process

management and the ability to learn and to face new ideas, while applying them effectively and immediately. Moreover, the speed and flexibility of learning as well as being able to comprehend situations and acquire new knowledge and skills represent important factors. Furthermore, it is important to include this ability into the daily routine, to open your mind (Dweck, 2016) and face the innovations rapidly. “Learning to learn” competences refer to the ability to organize one’s own learning process, including effective management of time and information, both individually and in groups. They also describe the awareness of one’s own learning process and needs in this respect, as well as the ability to identify available opportunities and overcome obstacles in order to make the learning process successful. These skills also refer to acquiring, processing, and learning new things, and also searching for and using tips. The ability to learn allows people to make use of their prior learning and life experience and use their knowledge and skills in a variety of contexts (Recommendation of the European Parliament and of the Council, 2006).

Sub-category gaps. According to McKinsey & Company (2021) a substantial majority of companies globally, accounting for 87 percent, acknowledge that they are either currently facing a skills gap or anticipate encountering one in the coming years. Thus, can argue that openness to lifelong learning is essential. As an example, employers are persistently struggling to fill positions that demand specialized skills, particularly in technology. Simultaneously, businesses are showing considerable efforts to enhance their existing workforce. There seems to be a potential avenue to address both of these predicaments simultaneously – companies can invest in upskilling and reskilling initiatives for their employees through dynamic learning and development programs, as it offers a way to not only bridge the skills gap but also contribute to boosting employee retention rates. The gap that arises from emerging technologies, signifies the disparity between the competencies that employers require to maintain competitiveness in today's economy and the current skill set possessed by their workforce. Thus, upskilling represents the solution to tackling the skills gap, attracting, and retaining exceptional employees, and enabling companies to accomplish more (Perna, 2023). One can thus conclude that gaps in lifelong learning can be displayed in mismatches between skills that are required to meet new challenges and existing skills possessed by the workforce. Undeniably, to overcome this skills gap, workforce needs to be open to lifelong learning.

Sub-category measurement. In order to understand lifelong learning, one needs to be able to measure its features. Yet, measuring something as broad as this proves to be exceptionally challenging. Nevertheless, efforts have been undertaken to gauge lifelong learning or concepts associated with it (Meerah et al., 2011). As an example, Crick, Broadfoot & Claxton (2004) assess lifelong learning using a lengthy questionnaire known as Effective Lifelong Learning Inventory (ELLI). The ELLI tool encompasses seven distinct domains: changing and learning, critical curiosity, meaning making, dependence and fragility, creativity, learning relationship, and strategic awareness. However, the ELLI questionnaire is extensive and wide-ranging in its scope. Also, it was primarily designed to evaluate lifelong learning aspects in school-going children and not among university students (Meerah et al., 2011). Kirby et al. (2010) introduce a brief lifelong learning questionnaire, which has been tailored for application in higher education institutions. Meerah et al. (2011) utilize this questionnaire to evaluate the levels of lifelong learning among university students in Malaysia. The questionnaire comprises

14 items that gauge five attributes associated with lifelong learners (goal setting, application of knowledge and skills, self-direction, and evaluation, locating information and adaptable learning strategies). Participants were tasked with providing their responses on a five-point Likert scale, spanning from -2 (strongly disagree) to +2 (strongly agree). Statements include: “I prefer to have others plan my learning”; “I am able to impose meaning upon what others see as disorder and I often find it difficult to locate information when I need it”.

Learning paths. Learning to obtain learning skills involves an initial step of obtaining fundamental basics such as literacy, numeracy, and ICT skills, which represent the basis for further learning. Building upon these foundational skills, individuals should be capable of accessing, obtaining, processing, and incorporating new knowledge and abilities. This demands effective managing of one's own learning journey, career path, and work patterns. Particularly important are traits such as perseverance in learning, maintaining concentration over extended periods, and critically analysing the goals and objectives of learning. Individuals should be able to allocate personal time for self-directed learning with discipline, while also participating in collaborative learning settings, benefiting from a diverse group, and sharing their own insights. It's important for individuals to arrange their own learning, assess their own progress, and seek guidance, information, and assistance when appropriate. Moreover, a positive mindset encompasses the enthusiasm and self-assurance to engage in continuous learning throughout one's life. A problem-solving attitude is not only advantageous for the learning process itself, but also supports an individual's capacity to navigate challenges and adapt to change. The inclination to apply past learning and life encounters, along with the curiosity to identify opportunities for learning and its application across various life situations, constitute essential components of a positive attitude (Recommendation of the European Parliament and of the Council, 2006).

3.3.2 Self-reflection

Self-reflection as a competency is closely related to critical thinking, while both skills belong to reflective competence cluster. Accordingly, reflective competence as a skill encompasses both the inclination and capability to reflect, i.e., being capable to question oneself and others with the intent of fostering growth. Additionally, it involves identifying the foundational patterns of behaviour, thought processes, and values. This skill also involves evaluating the implications of these elements for making informed decisions and acting (Ehlers, 2020, p. 91). Both critical thinking and self-reflection competences enable a shift in perspectives. Self-reflection competence enables individuals to detach their awareness from their own self and, concurrently, to challenge and alter viewpoints of established facts (Ehlers, 2020, p. 68).

Sub-category gaps. Research has shown that school performance is linked to various social and emotional factors, encompassing self-awareness, self-management, social awareness, and responsible decision-making. Nonetheless, there's a scarcity of experimental studies conducted in school settings that explore the connection between these factors and academic performance, and the findings have been inconsistent (Feron & Schils, 2020). Therefore, Feron & Schils (2020) use a randomized field experiment to whether self-reflection on school behaviour of underperforming secondary school students affected their school performance

(measured by grade point average or GPA), school engagement, and self-concept. The results show that students with higher levels of school motivation were around 29% more likely to comply. Students who reported stronger self-concepts regarding school tasks were approximately 17% less likely to comply. However, the treatment has not yielded significant effects on students' GPA, school motivation, hours dedicated to homework, or self-concept in relation to school tasks. Additionally, self-monitoring activities in work environments affect decision making, learning behaviour, strategy use, and learning motivation. Nevertheless, in most professional settings, there is typically only a restricted support for self-monitoring activities. Opportuneness for self-assessment and self-reflection might be few as it is complex to define individualized competency standards that match the workplace reality (van Loon, 2018).

Sub-category measurement. Undoubtedly, a critical, and reflective attitude is needed for students to be prepared for social and business demands when entering the labour market. Critical, reflective, and responsible self-evaluation processes help to develop such an attitude. Nonetheless, as these have both personal and highly subjective nature, these processes are difficult both to measure and assess. In order to encourage reflective learning a system that evaluates such a process is needed. The main receivers of the teaching-learning process are students, while the latter need to be prepared to listen to the guidance, to reflect about their conduct and to evaluate and value what they have achieved (Cambra-Fierro & Cambra-Berdún, 2007). A scale proposed by Cambra-Fierro & Cambra-Berdún (2007) measures the students' reflective capacity, while it assesses the tutorial guidance received and the extent to which this self-evaluation and reflection process brings better students' academic results. It also includes aspects that relate to the students' motivation, responsibility, and their own self-concept. Statements test students' responsibility and motivation with respect to teaching-learning process and include the following statements: "In general, I consider that I am responsible for my acts"; "I generally know what is right and what is wrong"; "I know what I want to achieve in this stage of my education". Next, the scale for self-concept involves three items and measures the concept that the students have about themselves, while self-evaluation scale consists of two items, and it assesses the students' level of familiarity with the self-evaluation concept itself. The scale also includes measuring the results and the satisfaction that is perceived by the students when they participated in self-evaluation processes.

Learning paths. One of the learning tools that promote self-reflection are reflection journals (Lew & Schmidt, 2011). Reflection journal writing is believed to empower students to critically assess their learning processes and behaviours, and to understand their capacity in order to refine their learning strategies (Gleaves, Walker & Grey, 2008). While employed across diverse courses, reflection journals essentially entail written accounts that students create while pondering about various learned concepts, critical incidents encountered during learning, or interactions with peers and educators. This practice spans over time and is aimed at gaining insights into someone's own learning experience (Thorpe, 2004). Moreover, the literature provides evidence that students, irrespective of their areas of study, demonstrate enhancements in their learning abilities – specifically, in their self-reflection skills – as a result of maintaining journal entries. Additionally, Lew & Schmidt (2011) show that engaging in self-reflection does result in enhancements in academic performance, albeit to a limited extent.

Also, another method is problem-based learning (PBL) which is characterized by the collaborative engagement of students in small groups. The learning process focuses on students' specific field of study, while there is a considerable emphasis on self-directed learning. In PBL, students acquire knowledge by actively resolving challenges and reflecting on their experiences (Hmelo-Silver, 2004).

3.3.3 Openness

Openness (to experience) is a part of a widely used framework for personality assessment known as the »Big Five« model. Besides openness, the model identifies the following traits: conscientiousness, extraversion, agreeableness, and neuroticism (Goldberg, 1992; Chmielewski & Morgan, 2013). Individuals characterized as open to experience typically possess a vivid imagination, demonstrate curiosity and have an open-minded attitude (Bakker & de Vreese, 2016). Openness pertains to an individual's receptiveness to new ideas, imagination, creativity, and insight. More open minded people tend to be inclined toward variety, seek new encounters, and demonstrate curiosity and perceptiveness. Another perspective on openness involves unshackling any preconceived ideas, fostering curiosity, and extending limits to embrace change and new experiences. In essence, when discussing openness, one refers to being open to new experiences and embracing various encounters. Openness to experience essentially echoes the concept of openness but remains rooted in the same foundational principles discussed above. Being open to change, welcoming new experiences, and possessing the ability to think creatively and unconventionally are all features of this personality trait (Johns, 2023). Moreover, McCrae (1993) measures openness to experience by measuring six aspects. Accordingly, individuals can be relatively open or closed to (i) fantasy, (ii) aesthetics, (iii) feelings, (iv) actions, (v) ideas and (vi) values – the Revised NEO Personality Inventory. These six facets covary to define a broad dimension of the openness.

Sub-category gaps. Scherer & Gustafsson (2015) offer evidence on students' willingness to participate in problem-solving, which is a motivating factor for learning processes. Specifically, they examine the effectiveness of various models in explaining the structure of students' openness and perseverance as indicators of their eagerness to engage in problem-solving across countries and the correlation with students' performance in innovative problem-solving. Openness is defined as the general eagerness to engage in problem solving that is based on self-beliefs, employment, and personality, whilst being an important determinant of creative processes. Utilizing the Programme for International Student Assessment (PISA) 2012 datasets from Australia, Norway, and Singapore, they discover the highest levels of perseverance in Singapore and the lowest levels in Norway. On the other hand, Norwegian students exhibited the greatest degree of openness, while Australian students displayed a moderate level, and Singaporean students demonstrated the lowest level (Scherer & Gustafsson, 2015). Accordingly, throughout the majority of the 20th century, psychologists believed that personality was shaped by social experiences, arising from the language and cultural norms of their society, thus personality traits vary across different cultures. Moreover, personality traits can differ between older generations and younger as the former grew up in

a different world, thus facing different life experience. Another view is that openness and its facets are strongly heritable (McCrae & Greenberg, 2014).

Sub-category measurement. Over the past few decades, the five-factor model of personality has emerged as the most extensively examined and highly esteemed model for personality traits. Although there is general consensus in most research regarding the characteristics of the initial four factors, the characterization of the fifth factor – openness to experience – has sparked controversy whether to employ a lexical approach, which is derived from language frequency within the lexicon of a particular language or a questionnaire-based approach to assess the openness (McElroy & Dowd, 2023). Thus, openness can be assessed through self-report questionnaires. The latter encompass a series of statements. Individuals are required to select the response that best mirrors their level of agreement or disagreement with each statement. The statements are carefully crafted to prompt thoughtful consideration, and participants rate them on a scale ranging from 1 (strongly disagree) to 5 (strongly agree). Some examples of these statements include: “I'm good at coming up with new ideas”; “I often think about the deeper meaning of things”; “I'm curious about how things work”, “I enjoy thinking about theoretical ideas”, “I have an active imagination”, “I appreciate being around diverse groups of people” (Johns, 2023). Moreover, the 12-item openness scale in the NEO-Five Factor Inventory can be used to measure openness to experience (Leung & Chiu, 2008). Undoubtedly, openness is observable as it becomes evident through individuals' actions and their spoken interactions (McCrae & Greenberg, 2014).

Learning paths. Following the definition of openness provided by McCrae & Greenberg (2014) where observability, universality, stability, and heritability represent the main properties of openness, one can argue that openness as a personality trait depends upon the social experience and is strongly heritable. However, people’s experience play a pivotal role in influencing the expression of personality traits. Several attempts have been undertaken to experimentally modify levels of openness. For instance, Jackson et al. (2012) engaged older adults in 16 weeks of inductive reasoning exercises and puzzle-solving, resulting in a modest increase (approximately one-quarter standard deviation) in their openness to ideas scores. Additionally, according to Leung & Chiu (2008) a learning environment that provides multicultural opportunities and encourages openness would be particularly favourable for fostering the growth of creative potential.

3.4 DECISION-MAKING

In the professional world, decision-making skills are essential for success. Graduates with weak decision-making skills may struggle to assess risks, identify opportunities, and make informed choices in their careers. Poor decision-making can lead to missed opportunities, ineffective problem-solving, and compromised performance, which can negatively impact career growth and advancement.

Decision category consist of three sub-categories: decision-making skills, independent working, situational adaptability.

3.4.1 Decision-making skills

Decision-making skill involves various factors such as intelligence, motivation, emotion regulation, experience, decisional styles and strategies, and leadership effectiveness. Bruine de Bruin et al. (2020) suggests that decision-making competence encompasses not only fluid intelligence but also motivation, emotion regulation, and experience.

Sub-category measurement. Since decision-making is not a basic human skill, but the result of the interplay of several skills, a different strategy was used. To define decision-making, we used the database created by Columbia University. The Decision Making Individual Differences Inventory (DMIDI) is a catalogue of over 200 individual difference measures commonly used in judgment and decision-making research. It contains measures about decision style and approach. Measures of decision style assess the ways in which individuals approach decision making, or thinking more generally (e.g., whether individuals adopt a rigorous analytic style or a gut-based experiential style). Measures of decision approach assess individuals' management of the decision process, both pre- and post-decision (e.g., indecision, regret). Decision-making is also possible to measure with ability tests. While questionnaires can provide valuable insights into individuals' self-perceptions and attitudes towards decision-making, they may not be the most effective method for measuring decision-making skills. Tests provide a more objective and standardized way to measure decision-making skills. They typically involve structured scenarios or tasks that require individuals to make decisions under specific conditions. Test items can be designed to assess various aspects of decision-making, such as problem analysis, information evaluation, risk assessment, and alternative selection. The scoring of test responses can be based on predetermined criteria, reducing potential bias and subjectivity.

Decision-making skills sub-category gaps. The NACE Job Outlook Report consistently highlighted the importance of "decision-making skills" as one of the critical attributes that employers seek in recent college graduates (NACE Job Outlook Report, 2021). Nutt (2019) explored the significance of effective decision-making skills in the workplace and their impact on business outcomes. Reports like the World Economic Forum's Global Competitiveness Report often mention the importance of decision-making skills for the competitiveness of individuals and nations (WEF, 2020).

Learning paths. Developing effective decision-making skills is a continuous process that involves both theoretical knowledge and practical experience. Learning paths include: case studies and simulations, since learning through case studies and simulations allows individuals to apply decision-making principles to real or simulated scenarios. Analysing past decision-making cases, both successful and unsuccessful, helps learners understand the complexities and challenges associated with decision-making. Also, mentoring and coaching by seeking guidance from experienced mentors or coaches can accelerate the development of decision-making skills. Mentors can share their practical experiences, provide advice, and offer insights into decision-making processes. Coaches can provide personalized feedback, facilitate self-reflection, and help individuals develop strategies to overcome decision-making challenges. Developing also ethical decision-making skills is crucial for making responsible

choices. Exploring ethical frameworks, moral reasoning, and case studies can help individuals consider ethical implications, values, and potential consequences in their decision-making processes.

3.4.2 Independent working

Independent working is an ability to work independently and encompasses self-directed learning and the effective organization of educational activities. Jurakulovich (2021) emphasises that independent work is a crucial aspect of students' learning activities and plays a significant role in their cognitive and learning processes. Independent work is seen as a form of educational activity that fosters students' readiness for self-development and adaptation in a changing educational and professional environment (Ibragimova et al. 2022). It involves the organization and management of one's own learning, including goal-setting, planning, and self-evaluation.

Sub-category gaps. The World Economic Forum's Global Competitiveness Report consistently highlighted the role of decision-making skills in a country's economic competitiveness (WEF, 2020). The NACE Job Outlook Report consistently emphasized "decision-making skills" as a critical attribute employers seek in recent college graduates (NACE Job Outlook Report, 2021). Independence is related to a sub-category of the Five-Factor Model of human personality (Big 5), and the key elements were identified based on research relevant to emotional stability.

Sub-category measurement. Roseveare (2006) proposes an "independence index" as a diagnostic tool to assess isolated functioning ability, which includes factors such as self-efficacy, social independence, functional independence, and anxiety.
Learning paths. Barreiro (2018) evaluates the role of independent work in cognitive development and teaching results, finding that well-guided and controlled independent work promotes independence and positive outcomes.

3.4.3 Situational adaptability

According to Luo et al. (2018) situational adaptability skill refers to an individual's ability, skill, disposition, willingness, and/or motivation to change or fit different task, social, or environmental features. It is considered a key source of mental resources and is especially important for new employees facing a new environment. The papers emphasize that in the increasingly changing nature of modern organizations, employees need to constantly improve their ability to adapt.

Situational adaptability sub-category gaps. The NACE Job Outlook Report often lists "adaptability and flexibility" as important qualities sought by employers when hiring recent college graduates (NACE Job outlook Report, 2021). Gervais and Sherman (2020) explored the role of adaptability in career success and found that adaptability is a key factor. The World Economic Forum's Global Competitiveness Report has consistently stressed the significance of adaptability and the ability to respond to changing situations for national competitiveness (WEF, 2020).

Sub-category measurement. When measuring situational adaptability, it's important to consider that it's a multifaceted skill that encompasses various dimensions, including emotional intelligence, cognitive flexibility, problem-solving, and communication. Therefore, a holistic approach that combines multiplte assessment methods is often the most effective way to evaluate this crucial competence. Assessment tools include Structured Behavioural Interviews, assessment centers, Psychometric Tests, 360-Degree Feedback, Role-Playing and Simulations. For example, Grim (2010) developed an Adaptability Situational Judgment Test (ASJT) to measure individual adaptability in applied settings. The ASJT showed criterion-related and nomological validity, indicating its potential as a practical and valid selection and assessment instrument for adaptability.

Learning paths. Johnstone (2021) found a positive relationship between mindfulness and individual adaptability in dynamic work contexts, specifically in dimensions such as work-stress adaptability, uncertainty adaptability, crisis adaptability, creative problem-solving adaptability, and learning adaptability.

3.5 WAYS TO CREATE

The category ways to create consists of three sub-categories: creativeness, proactiveness and innovativeness.

Jonathan Schooler, PhD, a professor of psychological and brain sciences at the University of California, Santa Barbara defines creativity as: “Creativity is at the core of innovation. We rely on innovation for advancing humanity, as well as for pleasure and entertainment”.

Adam Green, PhD, cognitive neuroscientist at Georgetown University and founder of the Society for the Neuroscience of Creativity adds that creativity underlies so much of what humans value and defines creativity as follows:

“The standard definition, that creativity is novel and useful, is a description of a product, by looking inward, we can see the process in action and start to identify the characteristics of creative thought. Neuroimaging is helping to shift the focus from creative product to creative process.”

Sub-category gaps. Whilst creativity is important in problem solving processes, the demand for innovation and proactivity is also getting higher by the year in work environments. Especially the sudden impact of COVID-19 pandemic drew attention to proactive working methods, such as preventing failures and making measures in advance. Innovativity also played a part because in most cases, companies and social systems had to improvise and make use of existing tech and hardware to cope with the situation. These competences are not emphasized in higher education, not to mention secondary education.

Anna Abraham, PhD, the E. Paul Torrance Professor and director of the Torrance Center for Creativity and Talent Development at the University of Georgia highlights, that the best predictor of creativity is openness to new experiences, creative people have the kind of curiosity that draws them toward learning new things and experiencing the world in new ways. And this is true across different age groups.

Learning Paths. John Kounios, PhD, is a professor of psychology at Drexel University in Philadelphia says that creativity isn't something that comes magically. It's a skill, and as with any new skill, the more you practice, the better you get. John Cleese, famous comedian argues that creativity is not a different skill, but a way of work and this means that everyone is capable of it. Thus this is not a scientific fact, the approach is useful for a learning path in the cases of proactivity and innovativity as well.

3.6 COLLABORATION

Collaboration category consists of three sub-categories: teamworking, working in a diverse team and presenting and public speaking.

These skills refer to the ability to convey information (orally and in writing) clearly and transparently, to listen to others and to understand their needs. They describe the ability to flexibly adapt the form of communication to different audiences. They indicate the ability to create an atmosphere of openness, striving for agreement by working out solutions that are satisfactory to each of the parties involved. On this basis, it is possible to draw conclusions about the person's ability to establish positive relationships with others, the awareness of his/her own role and the impact of actions taken on the team's overall performance. Interpersonal skills manifest themselves in activities that improve and facilitate the achievement of common goals through the sharing of knowledge, experience and information. They include elements such as providing support, being open to other people's ideas, opinions and feelings, and being able to put the group's decisions before one's own interests. Collaboration competence refers to the ability to effectively work and communicate with others towards a common goal (Lasater & Stiles, 2019). It involves skills such as active listening, clear and respectful communication, empathy, problem-solving, flexibility, and the ability to contribute and receive feedback. Collaboration competence is essential in diverse settings, including work environments, teams, projects, and partnerships, as it promotes synergy, productivity, innovation, and positive relationships among individuals or groups.

3.6.1 Teamworking

Teamwork skills are defined as social competencies that enhance an individual's ability to cooperate and collaborate with other team members to complete team tasks and goals (Noe, 2017). Teamworking is the ability of team members to work together, anticipate each other's needs, inspire confidence, and communicate effectively (Siskel & Flexman, 1962). It is a skill in which team members have information about each other's strengths and weaknesses (Alexander & Cooper-land, 1965). Morgan and colleagues (1986) identified seven key

dimensions of teamwork, namely: Giving suggestions or criticisms, Cooperation, Communication, Team spirit and morale, Adaptability, Coordination, and Acceptance of suggestions or criticism.

Sub-category gaps. The central concern revolves around the prevailing pedagogical practice in which students are primarily subjected to a didactic discourse on team dynamics and the determinants of team effectiveness. Subsequently, these students are assembled into teams for project-based endeavours without a deliberate focus on how to be a team player and fostering the refinement of teamwork skills (McKendall, 2000; Marasi, 2019). There is a limited integration of collaboration competencies into educational curricula and professional development programs. Collaboration skills are not always explicitly taught or emphasized in academic or professional settings. As a result, individuals may enter the workforce without the necessary competencies to effectively collaborate and work in teams. Additionally, the global nature of work and the rise of remote collaboration present new challenges. Collaborating across different time zones, cultures, and virtual platforms requires additional competencies, such as intercultural communication, virtual collaboration skills, and the ability to navigate diverse perspectives (Swartz, Barbosa, & Crawford, 2019).

Sub-category measurements. Lower and colleagues (2017) developed the scale that measures perceptions of teamwork skills in young people. Itt consists of 10 items rated on a Likert scale with five response options. Responses range from totally disagree" (1) to totally agree" (5). Sample item is “I trust in my ability to work as part of a team”.

Learning paths. Faculty can enhance students' understanding of team dynamics through a multifaceted approach that includes hands-on preparation, exploration of team development processes, analysis of team member interactions, and deliberate promotion of teamwork skills (Knott & Kayes, 2012). The didactic framework of adventure learning, consistent with the interpersonal paradigm articulated by Beer (1976), embodies a pedagogical method supported by a theoretical foundation, empirical practice, and iterative refinement (Veletsianos & Kleanthous, 2009). Following Beer's (1976) interpersonal framework, teambuilding training utilizes the modality of adventure learning by employing improvisational exercises that require on-the-spot responses and critical cognitive engagement for completion. Fifteen teambuilding exercises, adapted from the work of Gee and Gee (2011), include fostering a comprehensive understanding of teams and their developmental trajectories, promoting cohesion within the classroom team (and subsequently the student teams for the training project), and cultivating students' teamwork skills within the classroom (Marasi, 2019).

3.6.2 Working in a diverse team

The broad definition of diversity postulated earlier illustrates that diversity can occur on any possible dimension that can lead people to perceive another person as different (Homan & Greer, 2013). Working in a diverse team (e.g. multicultural, multigenerational) means to be open to other cultures and to alter the communication style (Hofstede, 2011) and to be aware of the diversity. Interpersonal skills when working in a diverse team consisting of members from different cultures, generations and possibly with disabilities, as well as displaying appropriate attitudes in this respect. Key element: Generational diversity; Functional diversity;

Cultural diversity (Plummer, 2018). Intercultural competence refers to the ability to identify cultural conditions and the impact they have on perception, judgement and action (Meyer, 2016). It is understood as the ability to change perspectives, shape interactions and perform professional tasks in a multicultural environment in a way that avoids misunderstandings and conflicts. This competence manifests itself in the acceptance and respect for cultural differences, the ability to apply cultural norms flexibly and to adapt one's own way of acting to achieve goals.

Sub-category gaps. Starke-Meyerring (2007) pointed out the difficulty of making students aware of their own cultural knowledge boundaries in traditional classroom settings and emphasised the benefits of experiential learning (Swartz, Barbosa, & Crawford, 2019).

Sub-category measurements. In general, researchers have relied on two paradigms to understand the impact of diversity in teams. The first is a factor-based approach that identifies and measures types of diversity. These factor-based approaches generally fall into two categories: Two-factor approaches, in which diversity is coded into two main types (e.g., visible— - i.e., easily detectable — and not visible), and multifactorial approaches, which attempt to create exhaustive and mutually exclusive categories. The second approach is based on proportions, or the ratio of minority to majority members. This is a more general approach that views types of diversity as interchangeable and focuses on proportion size as a variable of interest (Mannix & Neale, 2005).

Learning paths. For teams to master the art of dialogue, individuals must be able to manage their mental models through reflection and develop the ability to inquire (Senge, 1990). In addition, dialogue is key to helping teams develop an understanding of individual and team diversity issues (Nafukho, 2008). Empirical findings show that empathy helps to reduce differences between outgroup and ingroup members and underscore that the mere presence of interaction and shared characteristics is not sufficient to overcome apparent inequalities. Consequently, in human resource development (HRD), targeted pedagogical interventions can be strategically designed to include a component involving role-play scenarios or similar interactive exercises. These pedagogical aspects are designed to promote the acquisition of skills that enable individuals to skillfully incorporate alternative perspectives into their cognitive repertoire (Yeager & Nafukho, 2012). Furthermore, Globally networked learning environments (GNLEs) engage all participating students in intercultural exchange, especially those who do not have the opportunity to spend a semester abroad, with the goal of developing their intercultural competence (Zhu, Gareis, Bazzoni, & Rolland, 2005). By engaging students in collaborative projects in global classrooms, also known as Collaborative Online International Learning (COIL), instructors aim to teach intercultural competencies necessary not only for their professional development but also for their personal development, for example, by reducing ethnocentrism and promoting civic engagement (Starke-Meyerring, 2010; Swartz, Barbosa, & Crawford, 2019).

3.6.3 Presenting and public speaking

Public speaking is a process of creating and conveying messages to the audience (Wrench et al., 2012). It has, as a form of communication skill, pervaded today's learning environment (Ibrahi et al., 2022). Public speaking competence is directly related with communication strategies employed by learners. According to Mitchell and Myles (1998), less competent learners utilise communication strategies to prevent impending communicative breakdowns and maintain interaction during oral exchanges. Presentation skills are considered successful communicative goals (Kim, 2006; Evans, 2013). Rosenzweig (2021) described presentations as the tool to relay topics to audiences through a slide show, a demonstration, a lecture, or speech where presenters use words and pictures.

Sub-category gaps. Even if the path to developing oral presentation skills is known, teaching and assessing them is a time-consuming activity (Chan, 2011). Faced with this dilemma, Griffith and Care (2014) come to terms not only with regard to oral presentation skills but also with regard to the teaching and assessment of most "21st century" skills. Current feedback and assessment practices, while correct, are not scalable or feasible to conduct in regular classrooms, and that "new forms of data collection had to be developed and methods of analysing these new forms of data had to be identified and tested" (Ochoa & Dominiguez, 2020).

Sub-category measurements. Presentation Evaluation Scale (PES; Kazu 1996) is a measure developed for the purpose of evaluating skills and consists of the categories: preparation, communication, interaction, method and assessment. The different skills of those who makes presentation in each category are measured. Each category of PES is scored with 20 points and the students' presentation skills are calculated with 100 points by summing the points of the categories (Ozdemir & Tekin, 2016).

Learning paths. Through the act of observation, learners gain access to various examples of oral presentations and subsequently refine their presentation skills to align more effectively with established examples or benchmarks (Sadler, 1989). A critical factor in this process is the availability of examples or benchmarks of high presentation quality. Typically, in live case studies, students meet in groups or classes led by a leader from the collaborating institution. The presentation skills of this leader become the benchmark for student performance. In addition, during the course of the project, students present their discoveries to an audience of peers, faculty, and professionals to solicit feedback. These instances of intrinsic and extrinsic feedback facilitate critical evaluation and recalibration of their presentation skills, culminating in the enhancement of presentation skills within a productive self-regulated learning dynamic (Winne, 2004). Comparable to conventional written cases, live cases require the refinement of a range of written and oral communication skills such as articulation, attentive listening, question formulation, discussion, and composition. The experiential aspects of active listening and the application of analytical acumen under the constraints of real-time discourse, whether interacting with industry professionals or peers, create a conducive environment for refining oral communication skills (Mauffette-Leenders et al., 2000; Cummins & Johnson, 2021).

3.7 COMMUNICATION AND NETWORKING

Communication and networking category consists of three sub-categories: assertive communication, networking and intercultural competencies.

3.7.1 Assertive communication

Assertive communication has been defined as "the ability to speak and interact in a manner that considers and respects the rights and opinions of others while also standing up for your rights, needs, and personal boundaries" (Pipas & Jaradat, 2010, pp. 649). It involves effectively conveying one's desires, boundaries, and viewpoints without resorting to aggression, passivity, or manipulation (Alberti & Emmons, 2008; Murphy & Rutherford, 2015; Lapidus, 2016). Key elements of assertive communication are active listening (Khanna, 2020), expressing oneself with confidence (Connelly & Rotella, 1991; Mansour et al., 2020; Adib-Hajbaghery & Lotfi, 2018), mastery of assertiveness techniques (Murphy & Rutherford, 2015) and persuasion (Conger, 1998).

Sub-category gaps. Parray & Kumar (2016) examined the assertiveness level of undergraduate students from India, studying Bachelor of Arts, Science and Commerce. The results showed that among 100 respondents, 11 were 'situationally non-assertive', 35 'Somewhat assertive', 45 'Assertive', and 9 were 'probably aggressive'. Ibrahim & Rajab (2013) examined level of assertiveness among 229 Malaysian public university students and find that 95,2% of students in the sample exhibited high level of assertiveness. Erbay & Akçay (2013) examined assertiveness skill of social work students from Turkey and found that 19,2% of students in the sample were shy, 78,3% of students exhibit medium level of assertiveness and 2,5% exhibit high level of assertiveness.

Most frequently used assertiveness **measures** are Gambrill–Richey Assertiveness Inventory (Gambrill & Richey 1975) and Rathus Assertiveness Schedule (RAS) (Rathus, 1973).

Learning paths. To develop conceptual understanding of assertive communication one can attend courses such as Organizational behaviour and Effective communication as the latter usually cover topics on assertive communication. Also, reading books or articles on assertiveness to gain a solid foundation of knowledge is beneficial, along with exploration of online resources that explain assertiveness and provide practical tips. To practise assertive communication, one needs to engage in activities, such as presentations, role-plays, and joint group projects, which require students to deliberately practise active listening, persuasion, assertiveness techniques and develop confidence. One can engage in extra-curricular social activities which require practising assertive communication. Examples include organizing events, coaching others, resolving conflicts with others. To identify areas where one may struggle with assertiveness one needs to regularly reflect on its own assertive communication style and seek feedback from trusted individuals who can provide constructive criticism on how to improve assertiveness. Self-assessment instrument such as Rathus Assertiveness Schedule are also beneficial.

3.7.2 Networking

Networking skills are defined as the ability to create, develop, and use interpersonal relationships to enhance resource mobilization (Forret & Dougherty, 2004; Wolff & Moser, 2010). The ability to effectively networking can be a key mechanism for transforming the investment in social relationships into social capital, or the resources, information, and other expressive returns that people can access and mobilize within their social networks (Lin, 1999).

Sub-category gaps. The demographic variables of gender and socioeconomic status as well as the psychological variables of extraversion, self-esteem, and views toward workplace politics are usually correlated to networking activity. Several studies have revealed that these demographic and personal traits may affect people's capacity for and/or willingness to contact with those who may be able to help them in their employment or career (Forret & Dougherty, 2001).

Sub-category measurements. Networking skills are frequently assessed using a self-report methodology, which may induce bias due to replies that are socially acceptable (Gibson, Hardy & Buckley, 2014). Observer reports and biographical information can be used as alternatives to self-report, improving measurement objectivity (King & Bruner, 2000; Oh, Wang & Mount, 2010; Mumford, Barrett & Hester, 2012). Although concurrent designs are the most straightforward and popular, they only yield correlational data (Gibson, Hardy & Buckley, 2014). Longitudinal and retrospective designs provide more reliable data, nonetheless they also demand more resources to implement (Michael & Yukl, 1993; Wolff & Moser, 2009).

Learning paths. Networking can be taught through education (classes on interpersonal skills), training, and opportunities for practice and feedback. By learning how to approach others, introduce themselves, engage in small conversation, and give assistance, people can develop their networking abilities. These possibilities for skill development can improve people's networking skills and make them valuable partners in partnerships (de Janasz & Forret, 2008).

3.7.3 Intercultural competencies

The sub-category intercultural includes also foreign language. According to Lustig & Koester (2006), intercultural competence encompasses various elements, including knowledge, motivation, verbal and non-verbal communication skills, as well as appropriate and effective behaviours. Hiller & Wozniak (2009) further connect intercultural competence to characteristics such as tolerance for ambiguity, behavioural flexibility, communicative awareness, knowledge discovery, respect for others, and empathy. These dimensions encompass cognitive, emotional/attitudinal, and behavioural aspects. Bennett (2008) highlights the convergence among definitions, acknowledging that most scholars concur that intercultural competence involves a combination of cognitive, affective, and behavioural skills and traits that facilitate effective and suitable interactions across diverse cultural contexts.

Sub-measurement gaps. Research findings indicate that students attending international schools, including those following the IB curriculum, exhibit higher levels of intercultural understanding (Hayden & Wong, 1997), intercultural sensitivity (Straffon, 2003), and

international understanding (Hinrichs, 2003) compared to their counterparts in non-international schools. However, the empirical examination of the correlation between school diversity and intercultural understanding or competence remains insufficient. While school cultural diversity has the potential to foster students' intercultural capabilities, it does not guarantee automatic development. Studies reveal that students often restrict their interactions to peers from the same cultural background (Halualani et al., 2004; Volet & Ang, 1998) or a single cultural group (Halualani et al., 2004), suggesting that mere exposure to intercultural opportunities may not be enough.

Sub-category measurement. The Intercultural Development Inventory (IDI) (Hammer, Bennett & Wiseman, 2003) is commonly used by researchers and trainers to assess a person's experience of cultural differences. It originated from the Developmental Model of Intercultural Sensitivity (DMIS) (Bennett, 1993). The revised IDI consists of five factors representing increasing levels of intercultural sensitivity (Hammer, Bennett & Wiseman, 2003). The Behavioral Assessment Scale for Intercultural Competence (BASIC) (Koester & Olebe, 1988) measures intercultural communication competence behaviourally across eight domains (Lustig & Koester, 2006). The Cross-Cultural Adaptability Inventory (CCAI) (Kelley & Meyers, 1995) measures a person's ability to adapt to other cultures using 50 questions (Williams, 2005). While these scales provide quantitative measures, researchers advocate for qualitative methods such as observations, interviews, and portfolios to assess intercultural competence more deeply and authentically (Byram, 1997; Ingulsrud et al., 2002; Jacobson, Sleicher & Burke, 1999; Mendenhall et al., 2004). Portfolios serve as a relatively new method for demonstrating intercultural interaction and competence (Ingulsrud et al., 2002; Jacobson, Sleicher & Burke, 1999).

Learning paths. In schools, intercultural competence education is often integrated into subjects like foreign languages or social studies, although the extent of interculturality depends on the curriculum's orientation (Davies & Read, 2005). Intercultural competence can also be taught across various subjects as part of a school's mission. The potential for developing students' intercultural competence is theorized to be linked to attending culturally diverse schools (Hayden & Wong, 1997). Study abroad programs have been found to enhance intercultural understanding among university students, with the extent of change linked to students' goals and the duration of their stay (Kitsantas & Meyers, 2001; Medina-Lopez-Portillo, 2004; Olson & Kroeger, 2001).

3.8 THINKING AND REASONING

Thinking is a fundamental cognitive process that plays a crucial role in various taxonomies and frameworks within psychology and cognitive science. In the field of cognitive psychology, thinking is often categorized as a higher-order cognitive function alongside other mental processes such as perception, memory, and attention. Additionally, in the realm of decision-making, thinking is an integral component, as it involves the evaluation, analysis, and synthesis of information to make informed choices.

To define thinking, Cattell-Horn-Carroll (CHC) taxonomy was selected. The Cattell-Horn-Carroll (CHC) taxonomy is a widely recognized and comprehensive model that classifies

cognitive abilities. It provides a framework for understanding and assessing various cognitive processes, including thinking. Thinking, as a complex cognitive function, plays a significant role within this taxonomy. Thinking is an integral part of the CHC taxonomy as it cuts across various cognitive abilities. It relies on the integration and interaction of multiple cognitive processes to facilitate problem-solving, critical thinking, and decision-making. The CHC framework acknowledges the complexity and multidimensionality of thinking, highlighting its importance in cognitive functioning. As thinking is an ability, the best way to reliably measure it is with a test. Measuring thinking with a test can provide valuable insights into an individual's cognitive abilities, problem-solving skills, and critical thinking capacities. While there are various approaches to assessing thinking, developing a test that effectively measures these skills requires careful consideration of the test design, content validity, and scoring methods. The test design should reflect the nature of the thinking skills being measured. Multiple-choice questions, open-ended prompts, or scenario-based tasks can be used to assess different aspects of thinking. It is important to develop items that require higher-order thinking and go beyond simple recall or factual knowledge. The items should be challenging enough to differentiate between various levels of thinking abilities.

Thinking category consist of three sub-categories: **Critical thinking, problem solving, analytic and logical thinking**.

3.8.1 Critical thinking

Ennis (2016) suggests that critical thinking involves assessing statements and determining whether to accept or reject them. Bailin (1999) views critical thinking as a normative enterprise where appropriate criteria and standards are applied to what is said, done, or written. Dwyer (2014) describes critical thinking as a metacognitive process that involves purposeful, reflective judgment and promotes logical conclusions, good decision-making, and problem-solving. In summary, the papers collectively suggest that critical thinking involves assessing statements, applying criteria and standards, considering evidence, promoting clear communication, and engaging in reflective judgment.

Sub-category gaps. The employer survey conducted by the National Association of Colleges and Employers (NACE) found that "critical thinking/problem-solving" was one of the top skills employers sought in college graduates (NACE Job Outlook Report, 2021). The World Economic Forum's Global Competitiveness Report has consistently emphasized the importance of critical thinking skills for a country's economic competitiveness (WEF, 2020).

Sub-category measurement. Critical thinking is a vital skill in today's complex and rapidly changing world. It empowers individuals to analyse information, solve problems, make informed decisions, and navigate the challenges of an ever-evolving society. Tests are assessing a person's ability to analyse information, draw logical conclusions, and recognize assumptions, to measure critical thinking skills across various domains, including analysis, interpretation, inference, evaluation, and explanation.

Learning paths. Critical thinking can be improved by attending critical thinking workshops and training. Attending workshops or participating in training programs specifically focused on

critical thinking can provide structured guidance and skill development. These programs often include activities, exercises, and case studies that challenge individuals to think critically, analyse information, and make reasoned judgments. They can also introduce different thinking frameworks and techniques to enhance problem-solving abilities.

3.8.2 Problem solving

Rahman (2019) defines problem-solving as a cognitive process that involves systematic observation and critical thinking to find appropriate solutions or reach desired goals. Mourtos et al. (2004) focuses on engineering problem-solving and emphasizes the ability to identify and formulate problems. Setyawati et al. (2021) analyses problem-solving skills based on gender and identifies indicators such as defining the problem, exploring the issues, planning the solution, implementing the plan, and evaluating. However, it also suggests that problem-solving skills in the studied context are still low. Overall, problem-solving is as a process that requires observation, critical thinking, and the ability to identify and formulate problems.

Problem solving Sub-category gaps. The World Economic Forum's Global Competitiveness Report has consistently highlighted the significance of problem-solving skills for a nation's competitiveness (WEF, 2020). The Lumina Foundation's "A Stronger Nation" report (2017) stressed the importance of problem-solving skills as part of the broader set of essential learning outcomes for career readiness. The NACE Job Outlook Report consistently listed "problem-solving skills" as one of the top attributes employers seek in new college graduates (Nace Job outlook Report, 2021).

Sub-category measurement. Case-based assessments are often used in educational settings and professional evaluations. They can be administered as written assignments, oral presentations, or interactive simulations. Evaluators assess the quality of the problem-solving process, the appropriateness of proposed solutions, and the clarity of justifications. Individuals are required to gather relevant data or information within a case study. They need to sift through the provided information, recognizing key facts and disregarding irrelevant details. Test-takers are asked to propose potential solutions or strategies to address the identified problems. These solutions should be well-reasoned, practical, and considerate of the context presented in the case.

Learning paths. In order to improve in problem-solving several different approaches an be chosen. For example, Problem-based learning (PBL) which is an active learning approach that focuses on solving complex, real-world problems. In PBL, learners collaborate to define problems, conduct research, analyse information, and propose solutions. This method promotes critical thinking, as individuals must identify relevant information, evaluate evidence, and apply their knowledge to solve problems effectively. In addition, Inquiry-Based Learning which encourages curiosity, exploration, and independent thinking. It involves posing questions, investigating concepts, and seeking answers through research and experimentation. By engaging in inquiry-based learning, individuals develop skills in problem-solving, critical thinking, and self-directed learning. Teachers and mentors can guide the process by providing scaffolding and resources to support learners' inquiries. Also, collaborative learning environments foster critical thinking and social interaction. Group

discussions, team projects, and peer feedback provide opportunities for individuals to share perspectives, analyse different viewpoints, and develop reasoned arguments. Collaborative learning helps learners develop effective communication skills, consider diverse perspectives, and enhance their ability to work in teams.

3.8.3 Analytic and logical thinking

Qolfathiriyus et al. (2019) describe analytical thinking as the ability to understand, scrutinize, and break down facts in problem-solving, with characteristics including pre-analytical, partial-analytical, semi-analytical, and analytical thinking. They further note that analytical thinking is a thinking ability to help individuals in solving problems especially in mathematics. It is important for understanding the parts of situation, the ability to scrutinize and breakdown facts. Silva et al. (2021) suggest that logical thinking is the ability to solve difficulties using logical reasoning and is influenced by technological development.

Analytic and logical thinking Sub-category gaps. The World Economic Forum's Global Competitiveness Report has consistently highlighted the significance of analytical and logical thinking skills for a nation's competitiveness (WEF, 2020). Deming (2017) found that analytical and quantitative skills were highly valued in the job market and were associated with higher wages. The NACE Job Outlook Report consistently listed "analytical/quantitative skills" as one of the skills sought after by employers when hiring recent college graduates (NACE Job outlook Report, 2021).

Sub-category measurement. Measuring analytic and logical thinking skills involves assessing an individual's aptitude for structured and systematic reasoning, ability to understand and analyse complex relationships, structures, and rules. It involves solving logic puzzles and making inferences based on given information. measures a person's capacity to read, understand, and critically analyse dense texts, extract key information, discern the author's viewpoint, and evaluate a text's logical structure.

Learning paths. Başerer 2020 focuses on the level of logical thinking in individuals and finds that reading books daily is associated with higher logical thinking levels. Attridge et al. (2016) suggests that studying formal logic can improve logical reasoning skills, particularly for students with previous experience in logic. Dewantara and Ismaniar (2021) focuse on children aged 5-6 years and finds that the use of pop-up book media can enhance logical thinking abilities in this age group. Yuliana 2022 explores the impact of the guided inquiry learning model on logical thinking abilities and learning outcomes in science subjects, showing a significant positive effect.

3.9 INTEGRITY

In the category integrity there are three sub-categories responsible, ethical and trustworthy.

3.9.1 Responsible

Being responsible is an ability to take ownership of what you do in the workplace. Professionally define it, it could be said, responsibility is tenacity, dedication, and determination; willingness and ability to accept responsibility; commitment to the organization; sense of responsibility; capacity to become personally involved in the job (García-Álvarez et al., 2022). With another words, responsibility is the ability to identify and regulate one's own thoughts, feelings and behaviour along with a willingness to hold oneself accountable for the choices made and the social and personal outcomes generated from these choices (Mergler, 2007).

Sub-category gaps. Responsible is a competence that received a few amount of attention in literature, although, it is in the Top10 skills rated by employers. Its importance for employers lies in its relation to productivity: employers do believe, a responsible person promotes better productivity (García-Álvarez et al., 2022). Students' self-management skills – including responsibilities, being trustworthy and accountable – should be part of the HEI's educational programs (Bogdány et al., 2021). Still, KPMG measured gaps related to responsibility as the followings: aspirational gap between the candidates' perception of work profile and the reality of their work; lack of initiative to take up tasks outside their roles (KPMG, 2017).

Sub-category measurement. Being responisible is frequently measured using a self-report methodology – often as part of managerial or leadership skills - despite the fact that even self-reports and test scores represent the same constructs, there is no one-to-one correspondence between them (Wihlenda et al., 2023). According to a literature analysis, researchers found 4-7 points Likert scale as the most applied tool to measure skills in general (García-Álvarez et al., 2022). Mergler (2007) created a 30-item Personal Responsibility Questionnaire summarizing many relevant scales and literatures.

Learning paths. Wihlenda et al. (2023) found student initiatives as non-formal learning spaces to develop this skill since students take full responsibility over their learning projects. They also stated, that giving possibilities for higher education students to choose their learning goals and activities, so universities can think about promoting self-organized learning among students. Another informal way for development can be rotation of employees between jobs to make them understand of the roles and responsibilities of each role (Misko, 2008). Another studies emphasise importance of real life/real work experience in preparing university as an opportunity to develop series of skills (García-Álvarez et al., 2022; Abelha et al., 2020).

3.9.2 Ethical

Ethics are a set of beliefs and values that help individuals determine what actions are right or wrong based on their personal beliefs. Ethics incorporate principles and values that guide decision-making and treating people fairly and equitably. Business ethics are based on the core concepts of respect for people, the environment, and society. The principles of business

ethics emphasize the importance of honesty, integrity, and accountability in all interactions, considering the effects of decisions and actions on stakeholders, customers, suppliers, employees, competitors, the environment, and the community (Freeman, 1991).

Sub-category gaps. In their study, van Sand and Neck (2003) explore some of the causes of ethical gaps (by which they mean the lack of moral guidance from the organization to the individual, resulting in unethical behaviours), potential consequences of the ambiguities, and methods of bridging such gaps. Vasquez's (2022) study investigates university students' approach to evaluate and solve ethical dilemmas and the rationale behind this approach. In evaluating ethical dilemmas, students form judgments and recognize what is right or wrong in a given dilemma. However, in solving ethical dilemmas, their decisions may be congruent or incongruent with the judgment, thereby creating a gap between judgment and intention in cases of incongruency. The research also examines the rationale or motivations for why students cheat and plagiarize, and the contribution of personal and institutional characteristics as covariates. The findings reveal a gap between the judgment that evaluates an ethical dilemma and the intention to act to solve (by rewarding or punishing) such ethical dilemma.

Sub-category measurement. Holmes et al. (2012) measured ethical behaviour amongst undergraduate Commerce students at a New Zealand university. The 630 participating undergraduate students first completed a questionnaire on attitudes towards the tax system, which was followed by a simulation experiment requiring responses to hypothetical tax evasion decisions. Individual reward payments were contingent on the outcome of these tax evasion decisions. The questionnaire responses, indicating intended behaviour, were compared with the actual behaviour in the experiment. Vasquez's (2022) study uses a scenario-based 2 × 2 between-subjects experimental design, which is applied to 221 U.S.-based university students.

Learning paths. Ethics are generally taught in the family, through religious training in a special school, or through learning in the course of one's life (Sternberg, 2012). It is challenging (although certainly not impossible) to teach ethics directly in a secular school, because different religious, cultural, and other groups have somewhat different ideas about what is right and wrong under different circumstances. There are, however, core values that are common to almost all these religions and ethical systems that schools do teach and reinforce, for example, reciprocity (the golden rule), honesty, sincerity, compassion in the face of human suffering. In addition, many professions have codes of ethics that professionals are encouraged to follow, and sometimes, are bound to follow by contract or law. Research suggests that reflection is also critical to learning from past experiences (Kouchaki and Smith, 2020).

3.9.3 Trustworthy

Trustworthy incorporates key elements of behaviour such as integrity, honesty, loyalty and keeping promises. Integrity refers to the application of ethical principles and promoting ethics in the everyday life, while honesty is more focused on credibility. Loyalty is related to understanding the importance of commitment, and keeping promises is understood as respecting agreements and commitments in relationships. Trust provides information about

with whom we should share information, from whom we should accept information, and what consideration such information should be given (Carchiolo et al, 2010: 1893).

Sub-category gaps. Bogdány et al. (2021) assessed competency requirements of HR graduate students that the potential employers necessitate, and state that the development of willingness to take on responsibilities and challenges, the understanding of the implications of new information, dependability, commitment to do the job correctly and carefully, being trustworthy and accountable and paying attention to details should be an integral part of HR education.

Trust and trustworthy have traditionally been **measured** with attitude surveys, such as General Social Survey and World Values Survey (Ben-Ner and Halldorsson, 2010). Since the publication of Berg, Dickhaut, and McCabe (1995) economists have used the amount sent in the investment or trust game as a behavioural measure of trusting, and the amount or proportion returned as a measure of trustworthiness. Nevertheless, it has been understood that the amounts sent and returned may reflect more than just trusting and trustworthiness, respectively, and that these have many layers of meaning and possible interpretations (Cox, 2004).

Learning paths. Trustworthy is similar to ethics in this sense, it is generally taught in the family, through religious training in a special school, or through learning in the course of one's life (Sternberg, 2012).

3.10 DIGITAL PROFICIENCY

Category digital skills consist of advanced computer handling, collaborating in digital environment and programming.

3.10.1 Advanced computer handling

Advanced computer handling is connected to ICT (information, communications and technology) literacy. Computational thinking has become an important skill of computer literacy. Relatedly, computer programming learning can be regarded as a training process which can improve students' computational thinking skills. The latter can be defined as a fundamental ability that allows people to design and think while using the language of computation (Tsai, Wang & Hsu, 2018). Next, defining computer literacy has proven to be an elusive endeavour. Significant advances in computer technology have spawned six relative distinct perspectives on computer literacy: computer awareness, programming, evolving concept and planning, behavioural approach, reaction and process, and personal needs (Kay, 1992). Gilster (1997) defines digital literacy as an ability to understand and use information from various digital sources. Hence, digital literacy covers not only reading skills but also critical thinking skills that are needed to access the information. Finally, IT skills refer to the ability to use computers in order to obtain, evaluate, store, create, present and exchange information, and to communicate and participate in collaborative networks through the Internet. Information and data literacy includes (among others) browsing, searching, filtering, evaluating and managing data, information and digital content (European Commission, n.d.).

Sub-category gaps. It has been reported that employers value several graduate employability skills, including teamwork, problem solving, self-management, knowledge of the business, IT skills, literacy and numeracy, interpersonal and communication skills, initiative, and leadership where necessary (Maciejewski et al., 2020); the role of IT skills is also mentioned. To properly evaluate students' competencies of computational thinking skills, a reliable and convenient tool for schoolteachers and computer educators needs to be developed. Examining learners' perceptions of their own abilities of computer programming, i.e., their self-efficacy for computer programming, from a literacy angle may provide a convenient solution (Tsai, Wang & Hsu, 2018). Young generations should be able to control modern computers. Therefore, one of the most crucial tasks of school computer science should be to develop thinking and creative abilities of young students. Undoubtedly, there are still some problems of teaching computer science, as pinpointed in Pardaboyevich, Abdunazirovich & Saydullayevich (2020).

Sub-category measurement. As an example of measuring computational thinking skills, the Computer Programming Self-Efficacy Scale (CPSES) can be used. It consists of five subscales – Logical Thinking, Cooperation, Algorithm, Control, and Debug – while each subscale includes several statements. As an example, the subscale Algorithm includes the following three statements: (i) I can figure out program procedures without a sample, (ii) I don't need others' help to construct a program, (iii) I can make use of programming to solve a problem. The overall scale and all subscales have good reliabilities and validities. Some prior studies have built up some foundations for developing the beforementioned instrument; nonetheless, current CPSES is unique in several aspects. As an example, it is designed to examine general computational thinking skills at a literacy level required for all future citizens, and not for computer engineering professionals (Tsai, Wang & Hsu, 2018).

Learning paths. There are several learning paths that can be used to develop IT skills. Firstly, computer assisted learning is organized, managed, and controlled according to the relationship between the student and the computer, while the communication with the computer takes a form of a didactic game, which increases the motivation of students (Pardaboyevich, Abdunazirovich & Saydullayevich (2020). Next, a game known as a "serious game" is a systematic play that includes rules, challenges, and goals, while it is created for entertainment. Contrarily, gamification exhibits a serious purpose rather than entertainment. Although closely related, the main difference between serious gaming and gamification concepts is that serious games are full-featured games while gamification is a broader perspective that uses game elements for a serious purpose (Gurbuz & Celik, 2022). Thirdly, media use in the classroom benefits the teaching and learning process as media can make information clearer, create more space, time, and energy for learning, motivate students and increase their desire to participate in class (Fitrawati et al., 2022). Finally, the flipped classroom is a pedagogical technique that uses electronic means such as online learning to provide lecture material to students at home and use class time for practical implementation activities. Moreover, flipped classroom approach is a technology-based pedagogy consisting of two components: direct computer-based student education outside the classroom through video lectures and engaging in team learning experiences within the classroom (Lysetty et al., 2022).

3.10.2 Collaborating in digital environment

The pandemic has forced business schools to move their pedagogical processes in digital environment, which has been challenging for both students and lecturers. More importantly, it has showcased the importance of the skill of collaboration in digital environments for successful completion of academic objectives. In outlining the suggestions for developing this skill, we glean from research on student collaboration, teamwork and Massive Open Online Courses. Collaboration (together with communication) is one of the competences in The Digital Competence Framework for Citizens (DigComp) developed in the EU. It encompasses the following: interacting through digital technologies; sharing information and content through digital technologies; engaging in citizenship through digital technologies; collaborating through digital technologies; netiquette, and managing digital identity (European Commission, n.d.).

Next, collaboration at school occurs when groups of people work together to achieve a common objective, such as completing a project, developing a survey etc. It is about cooperation rather than competition (Gopinathan et al., 2022). Online collaboration means successfully working together in a team via digital means (Oliveira, Tinoca, & Pereira, 2011; Saunders, 2020). Online work fosters higher order thinking and provides students to develop competences in real-world situation (Oliveira, Tinoca, & Pereira, 2011). We argue that collaborating in digital environment is a multi-faceted skills consisting of collaborative learning (i.e. peer interactions) and interactions with collaborative tools (i.e. softwares).

According to Shonfeld et al. (2021): “Collaborative learning involves interaction among learners combined with social or professional communication, enabled by accessibility and communication of an online network that creates learning communities.” Successful collaboration in online environment requires communication (e,g. Viber chats, Zoom chats, MS Teams, instant messaging) while documents are deposited and shared through cloud-based services. More specifically, collaborative tools are needed, such as Google Meet, Google Classroom, Zoom, and the use of such tools is positively related with student engagement (Gopinathan et al., 2022). One software solution that responds to both collaboration and communication issues simultaneously challenges is Slack, a digital platform, that is widely used by companies (Slack, 2023). Online collaboration requires development of certain routines, e.g. the use of regular meetings to check in, and to keep the group progressing towards goal. Next, sharing documents using different platforms and keeping not of the progress via track changes is also crucial. The third one is working side-by-side virtually, meaning that people are on a video call and working simultaneously on the same project. Finally, one needs to decide on the frequency of communication during the day (Saunders, 2020).

Sub-category gaps. There are few studies exploring the nature of collaboration in online learning platforms (Razmerita et al. 2020). The process of developing social interactions online and the effects that such interactions have on student learning is under researched (Faja, 2013). Business leaders have called for business schools to offer opportunities to students for improving interpersonal skills as these are essential for success (Mullins, 2017).

Sub-category measurement. Below are two possible options to measure collaboration in digital environment. Firstly, one can use student attitude surveys whereby responses are ranged from 1 (strongly disagree) to 5 (strongly agree). There are several statements under each item. As an example, the student needs to rank whether communicating with team members regularly help him/her to understand the team project better. Also, the student needs to rank the extent of which the instructor acts as a referee when members cannot seem to resolve differences (Ku, Tseng, & Akarasriworn, 2013). Secondly, Hinyard et al. (2019) use the Self-Assessed Collaboration Skills measure. The latter measure includes 11 items that consist of three dimensions of collaboration, namely information sharing, learning, and team support. As an example, statements measure on how easily one is able to share information and ideas with others.

Learning paths. Collaboration requires peer interaction and interaction with technology. Developing the skills of online collaboration requires participating in online interactions and skills related to collaboration tools: software for searching, information sharing, data storage, working on documents in cloud. The purpose is to promote knowledge intensive social interactions among learners (Razmerita et al., 2020).
Development of skills could be achieved via the following learning pathways:

- synchronous lectures and participation in breakout rooms;
- a more in-depth experience is participation in a group project, which would require exclusive online collaboration to allow for a lived-in experience;
- skill development workshop for virtual teamwork with emphasis on collaboration (peer interaction);
- knowledge acquisition workshop on the use of software for depositing data, working on a shared document, retrieving data, using chat/discussion forums and software (i.e. collaborative tools);
- reflection exercise on learning points upon completion of an online course;
- recording online interaction and receiving feedback by a behavioural expert;
- learning about best practices of communication and collaboration in digital environment;
- a written comparisons of an experience of face-to-face and virtual collaboration and what were the differences;
- participation in a discussion where students share their good and bad experience with online collaboration;
- in a group project, keeping a diary of how one performed today and what he/she can improve next day.

4.10.3 Programming

Programming skill is the ability to create, modify, implement, and debug software programs using programming languages. It is based on problem-solving and analytical skills. Coding involves the knowledge of coding concepts, algorithms, data structures, syntax, and semantics, as well as the ability to apply this knowledge to solve programming problems effectively (European Commission, 2017; Bocconi et al., 2016).

According to the European Commission's DigComp 2.1 Framework, programming competence is a key component of digital competence, which is described as the confident, critical, and responsible use of digital technologies for work, leisure, and for communication. Programming is defined as “to plan and develop a sequence of understandable instructions for a computing system to solve a given problem or perform a specific task” (European Commission, 2017).

Several studies have highlighted the importance of programming competence for employability, innovation, and societal development. A study by the OECD's Centre for Educational Research and Innovation states that programming is becoming an essential literacy in the digital age and that programming competence is increasingly seen as a key competence for lifelong learning (OECD, 2016).

Sub-category gaps. It has been discovered that coding knowledge of students is superficial and limited to surface, it lacks detailed mental models, programmers fail to apply relevant knowledge, and apply a ‘‘line by line’’ approach rather than using meaningful program ‘‘chunks’’ and structures (Winslow, 1996). They lack understanding of specific programming language constructs (e.g., variables, arrays, loops, recursion), spend little time in planning and testing of the code, have general issues related to program plans use, they are poor at tracking code and their prior knowledge can be a source of errors (Du Boulay, 1989). Their knowledge is often context specific and not general (Kurland et al., 1989). Several authors have suggested that the most crucial issues are linked to the fundamental challenges of problem solving, creating design and expressing a solution/design as a functional program (Robins, Rountree & Rountree, 2003). Programmers might also lack practical experience, they have inadequate knowledge of specific programming languages, insufficient understanding of algorithms and data structures, exhibit poor collaboration and communication skills and have limited understanding of software development methodologies.

Sub-category measurements. Bergersen et al. (2011) showed how time and quality for programming task solutions may be combined as an ordinal variable of performance. Bergersen et al. (2014) developed an instrument to measure individual’s programming skill based on actual performance on a set of coding tasks. The instrument is useful for identification of professional programmers. Li et al. (2022) proposed a Programming Skill Tracing (PST) model to measure the programming skill proficiency of learners in the programming exercise process. Teachers and researchers use a variety of approaches for measuring students’ skills in programming but there is no consensus, while surveys are often non-standard and ad-hoc and tests are impractical and time-consuming. Duran et al. (2019) introduced and evaluated an instrument for language independent evaluation of a student’s prior programming knowledge. It identifies 3 main components: basic programming concepts, advanced concepts, and object-oriented programming concepts. The European Commission's DigComp 2.1 Framework (European Commission, 2017) identifies five levels of programming competence, ranging from foundation skills (e.g., writing simple scripts) to advanced skills (e.g., developing complex software applications).

Learning paths. The coding skills can be learned through programming courses. There are 5 stages of this skill development: novice, advanced, beginner, competence, proficiency and

expert (Robins, Rountree & Rountree, 2003). It takes roughly ten years to develop from a novice to an expert (Winslow, 1996). Du Boulay (1989) argues that there are 5 overlapping domains and possible sources of difficulty which must be mastered: general orientation (what programs are for and what we can use them for), the notional machine (a computer model as it relates to programs execution), notation (syntax and semantics of a programming language), structures (plans and schemas), and pragmatics (skills of planning, developing, testing and debugging).

Learning programming is a complex process involving a variety of cognitive activities, practical skills acquisition and mental representations related to program design, understanding, modifying, debugging and documenting. It requires construction of conceptual knowledge, structuring of basic operations into schemas and plans, and strategies to derive benefits from coding aids (Rogalski & Samurcay, 1990).

4. SKILLS MATRIX

4.1 METHODOLOGY

The creation of the skill matrix is based on two approaches. One is the review of fresh literature on skill demand from the world of work and scientific publications on recent studies that are counting the effects of the Pandemic. The other viewpoint is the actual processes of companies that need solid proof that the employees they hire are equipped with the skills needed for the job.

Therefore, we designed the matrix to be easily understandable and ready to use by students and HR experts and company leaders.

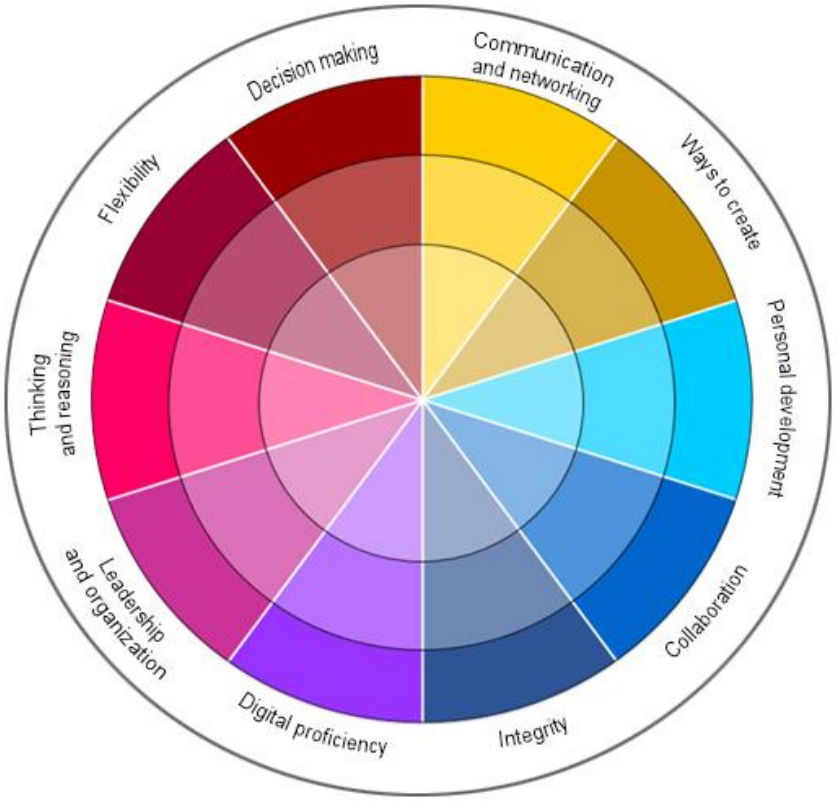
The third aspect is the level of education. At the kick-off meeting we decided to use the EQF as a reference for the complexity of skills and measurement levels. We examined the competence requirements for the higher education output and found that the 5th, 6th and 7th levels of the EQF (see Table 5) are the most suitable in the participating countries.

Figure 6: EQF Learning Outcomes Definitions on Levels 5-7

	Knowledge	**Skills**	**Responsibility and autonomy**
5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	Exercise management and supervision in contexts of work or study activities where there is unpredictable change; review and develop performance of self and others
6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	Manage complex technical or professional activities or projects, taking responsibility for decision-making in unpredictable work or study contexts; take responsibility for managing professional development of individuals and groups
7	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams

During the desk research, we identified several skills and organized them into categories in a way that the sub-categories support each other, they are measurable and suitable for university students. We decided to use the word “Categories” because there is some inconsistency how different publications refer to a given concept, so there are skills, competences and sub-skills, and there are arguments in education which is which, but we did not want to open educational academic debate on something that is in public domain and commonly used and understood by both HE teachers and HR experts. After the careful iteration and weighing process, the following structure was formed to be the basis of the Matrix (see Figure 2):

Figure 7: The SKIPPER Competence Wheel - the Category structure



There are of course some overlaps in the skills, but this issue is taken in account in the measurement system that is adding the levels of complexity regarding the three selected levels of EQF, defining the expertise of the student and the mastery of the given category.

In the SKIPPER Portfolio, this Matrix will be the backbone of the measurement system, with regard of the Learning Paths and personal development. We also developed the first draft of the measurement tool that will be a tile-based tool that is easy to administer through the screen of a smartphone.

5. FOCUS GROUPS

5.1 METHODOLOGY AND DATA

A focus group is a qualitative method to gather primary data. Essentially, it is a group interview where participants interact with the facilitator and each other, and respond to posed questions. Aside from gathering large amounts of data, the main added value of a focus group lies in the opportunity to share views based on hearing other participants' responses. With this, researchers can get to know the similarities and differences among participants in more detail, based on the interaction that develops in the course of a focus group (Krueger, 2014).

To gather primary data, this work package employed a qualitative research design. Such design was chosen, because the nature of the study was explorative. Specifically, we attempted to gain student insight into learning paths of skills that increase their employability. We were interested in gaining insight into the different and informal ways of building individual skills. We investigated two research questions:

- To explore the various informal ways students gain and nurture skills.
- To explore students' views related to an application (app).

The Focus groups followed a protocol of semi-structured interviews and had two main objectives:

1. To explore the various ways students gain and nurture selected categories (as identified in the skills matrix)
2. To explore students' views related to an application (app)

Altogether, approx. 36 individuals needed to participate across 6 focus groups. Out of these there shall be participants that are:

a) undergraduate students;
b) graduate students;
c) if possible a blend of exchange and non-exchange students.

A SKIPPER Focus Group Guideline was developed for the conductors with the Interview schedule, questions and additional information. Group size were 6-8 people per group, participants of the focus group were selected via a convenience sampling design. Time required for the focus groups was 90 – 120 minutes. The focus groups were conducted in national language (and then translated) or English. No full transcript was needed, a data collection form was created to collect the relevant information for the further steps of the development.

Qualitative data were collected from students at different levels of University, undergraduate and graduate degree at the master and doctoral levels. Three project partners, UL, UP, and UWEB collected data and assigned principal investigators to conduct 3 focus groups at UL and UP and two at UWEB. This enabled us to get a cross-cultural perspective of the skill-building activities. Researchers recruited participants via a convenience sampling method.

Structured focus groups in our project lasted between 90 and 120 minutes. They were conducted either in-person or online via Zoom. Students were asked to sign a consent form at the beginning. The focus groups were recorded. Transcriptions were made and thereafter the recordings were destroyed. Participants' anonymity and confidentiality were assured and only researchers had access to the data. The data are being handled with extreme care and in line with the EU guidelines on data protection.

SKIPPER Focus Group Guideline. The facilitators of the structured focus groups in each country followed a guide, which consisted of three parts: 1) explaining the purpose of the project and the research and the agenda; 2) exploration of students' learning paths for different skills identified in the skills matrix; 3) exploration of students' views towards an application for documenting skill development. The facilitators took notes during the focus group. While the focus group was structured in nature, when an interesting topic arose, researchers could explore this further by posing additional questions. Facilitators used a pre-prepared guide with questions and an accompanying power-point presentation to present the aims of focus groups and the skills matrix. The interview guide is given in the appendix 1.

One of the two main parts of the focus group explored the different learning paths and lasted approx. 45-60 minutes. Here, participants were asked to read the skills and think about what it means. If there were misunderstandings in the definition of a given skill, the facilitator provided an explanation. To start the discussion, participants were asked to choose a skill they felt confident in and have developed it. This question enabled facilitators to explore skills that students have been developing and have knowledge of. Special attention was devoted to stressing that the learning paths need to have occurred in informal settings and not as part of formal education (for example at the educational level). After hearing the first opinion and practical experience, other participants either chose the same skill to talk about or added a different one to the list.

The second part of the focus group explored participants' views about an application and lasted about 25 minutes. Here, facilitators tapped into the following topics: the functionalities of the app; the user-interface that would motivate participants to continuously use the app; the motives for potential use of the app.

The focus group closed by providing an open space for participants to share additional insights and things they might have come across during the focus group but were for some reason not able to share.

The researchers individually read the focus group transcripts and prepared summaries based on a template. Here the focus was to answer the research questions and informed the next work packages on how the newly acquired knowledge can be integrated in the future outputs. researchers prepared the initial answers, summarized the opinions, and presented the similar but also different views related to skill building, learning paths, and the app. Results are summarized by each country below and together in the final section of this chapter.

5.2 HUNGARY

Partner Institution:	University of Pannonia		
Date of the Focus Groups:	May 10, 2023	May 16, 2023	May 31, 2023
Moderator(s):	Tamás Kigyós, Annamária Sassné Grósz, Ágnes Raffay-Danyi, Júlia Tobak		
Number of Participants:	8	4	6
Duration:	90-105 minutes		

5.2.1 Learning paths for selected categories

Participants in three focus groups in Hungary selected patience, creativity, problem-solving, communication, personal skills and independence as important ones and provided possible learning paths to develop each category.

Category **patience** was chosen since participants believed it is a necessary skill that participants developed during their hobbies, and leisure activities. Learning paths participants identified spanned from early life to when attending university. In the early life this category can be developed when helping out in the kitchen, first just watching grandma cooking and baking, then joining in with the activities. Would like to do a baking/patisserie course. During primary/secondary school when helping with repairs around the house, mainly with electricity and putting up plasterboards, horse riding, and caring for horses (horse massage), cycling, repairing technical faults on the bicycle, solving emergency situations and hand and nail care, inspired by a friend's mother, would like to start their own business. At the university when reading, especially books aiming to help self-development, gardening, martial arts as well as in photography, video making and editing, participating in prize-awarded challenges. Participants listed suggestions for the development of the category such as learning psychology.

The next category participants chose was **creativity** since they believed people need creativity to be successful or to enjoy their hobbies. The identified learning paths in early life were helping out in the kitchen, first just watching grandma cooking and baking, then joining in with the activities. During primary/secondary school one can develop creativity when helping with repairs around the house, mainly with electricity and putting up plasterboards, in arts - dance, horse riding, and caring for horses (horse massage) and hand and nail care. At the university the participants listed the next activities where they believe creativity can be developed: photography, video making, and editing, writing books and poems, dancing, making tattoos, being barista, mixer courses, experience in the hospitality industry, at role play games. Participants suggested performing (arts), skills development, hobbies based on handicraft and participating in find-yourself-type events for the development of the category.

Third category identified was **problem-solving**, since the participants believed this is a fundamental skill for everyday life, and it can help with specific activities (such as solving technical problems when cycling, or repairing electrical faults around the house). Again, learning paths participants identified were helping with repairs around the house, mainly with

electricity, cycling, repairing technical faults on the bicycle, solving emergency situations and playing board games. At the university the category can be developed when organizing events, participating in prize award challenges, playing board games and playing computer games at hobby and professional level. For this category participants also identified category gaps especially for analytical skills – would like to have more skills for doing research and suggested some university course that helps with research, SAP course and economic analysis course, to augment the university studies in order to develop problem-solving.

Students also identified **communication** since this skill is needed in everyday life, and it is a core element of other competencies as well. The identified learning paths of participants were for example joining the English Club at the library, joining events, presentations in classes. Again they identified category gaps, especially when people get into embarrassing situations if they don't know how to communicate differently with different people. You need to know who you are talking to and communicate accordingly. Participants also made suggestions for the development of the category by attending personal speaking course, training with the company, knowledge sharing and pushing people (students, employees) to stand up in front of others, to do presentations.

Personal development were the next category identified for which participants thought as an important one because one has to know yourself and your goals, but you have to be aware that everything is changing. The identified learning paths spanned from volunteering, working part-time, moving to a different country to study, joining a community. Participants thought there can be category gaps because it can be scary to meet people if you are an introverted person, or when you have to get out of your comfort zone. A lack of personal skills can result in somebody not being open to others. They suggested pushing people (students, employees) to stand up in front of others, to do presentations and making students participate in events (gently forcing them) in order to develop personal skills.

Participants in Hungary also identified **independence** as an important one since it teaches you to be brave and to believe that you can solve everything. They identified learning paths such as working abroad, traveling, learning from connections/friends abroad and losing a parent at a young age.

5.2.2 APP design feedback

The participants proposed the development of an app and a website since not everyone would download the app. The website's advertisements could be strategically placed in high-traffic locations, leveraging the use of QR codes for maximum effectiveness. Further suggestions are:

- Marketing. Promotion should begin at the beginning of studies to accompany the learning journey. Emphasize the international development of the app with Hungarian participation.
- Integration into courses. Integrate the platform's completion into a specific course.
- Social media. It's worth aligning the app with LinkedIn but it should not be possible to share on social media platforms too much to maintain professionalism. Involving influencers should be done smartly to avoid undermining the system's credibility.
- Validity. The app should be coordinated by experts in professional training.

- Simplicity. It should be short and simple.
- Career guidance. It could assist with career choices before and during university.
- Advertising for companies. It's worth communicating the system to companies.

Motives for usage were personal communication and feedback on progress, identifying areas for improvement, and receiving personalized suggestions can make users feel a sense of accomplishment.

Next **functionalities/features** would make the app valuable and personalised participants identified were:

- Continuous progress feedback. To ensure users stay motivated, the system should provide ongoing feedback on their achievements and direction, similar to Duolingo.
- Social media sharing. Users should have the option to share their personal progress on social media platforms (some individuals find this motivating but some find it frustrating).
- Progress tracking. The ability to transparently track one's development and reflect on their journey from the starting point to the present is essential.
- Achievement badges. Implementing a system that rewards users for reaching milestones.
- Personalized avatars can provide a sense of companionship and personalization.
- Mentor function. Getting feedback from a professional with relevant expertise.
- Real interaction. Personal communication and feedback, identifying areas for improvement, and receiving personalized suggestions make users feel a sense of accomplishment.
- Group chat for skills. Providing the ability to have separate group chats for each skill would facilitate discussions and collaboration among users.
- Event recommendations can further enhance their skills would be beneficial.
- Success stories as motivation for users.
- CV integration. Users should be able to use their results and summary from the application as a valuable addition to their CVs.

Suggestions for **design** were:

- University branding. The app should reflect the visual identity and branding of the university, maintaining consistency and promoting a sense of affiliation.
- Progress indicators. To visually represent progress, completed milestones should be showcased using vibrant and lively colours, while incomplete ones could be depicted with more muted or faded colours, resembling a spiderweb-like design.
- User-friendly platform. The application should have an intuitive and user-friendly interface.
- Name. Pannonia's Skipper Passport in UP.
- Interface. Designing a serious interface would make it more professional, and students would take it more seriously, like UP's Moodle platform.

5.3 POLAND

Partner Institution:	Wroclaw University of Economics and Business	
Date of the Focus Group:	May 31, 2023	June 5, 2023
Moderator(s):	Elżbieta Więsław	
Number of Participants:	9	9
Duration:	120 minutes	120 minutes

5.3.1 Learning paths for selected categories

Participants in two focus groups in Poland chose the next categories: collaboration, personal competences, decisions as well as network + communication as important ones and provided possible learning paths to develop each category.

Collaboration was identified since collaboration simplifies and speeds up work and provides an opportunity to review errors. It allows team members to use their best resources and gives access to multiple points of view. Participants identified several learning paths. At an early age, cooperation can be learned by sharing household chores and getting the overall effect. Having siblings stimulates learning to cooperate, but also team games, teamwork, or trying to achieve a goal that one believes in, but requires the support of others are beneficial. During the study, it is worth belonging to student organizations that organize many events, which allows you to learn to share responsibilities and implement them together, to use the best competencies of individual team members, and not duplicate tasks.

Participants identified category gaps in the form of a lack of familiarity with the operation of the team when entering a new team. They also identified a gap as a problem of trusting and giving up control to another person, having communication problems in the team and differences in the understanding of tasks and with individualistic approach to tasks, unwillingness to share responsibility and tasks. For the development of the category participants suggested to learn by participating in teams, master the ability to divide tasks, and learn about one's own and other team members' competencies and use them in teamwork, learn to find a common goal with the person or group you want to work with, seek feedback from the team leader and other group participants to get a holistic view, improve listening and communication skills and create bonds between team members and admit ignorance or ask for help if needed.

Participants also identified **personal development** as important ones which allow a person to develop personally and professionally, learn from mistakes, and improve their skills. It is important to be able to learn, because technologies change. Participants reported issues with understanding the scope of personal competencies. Participants identified that the main motivation for acquiring knowledge and learning (develop this competences) is the desire to understand the world around us. A favourable family, peer, and school environment that stimulates it help children acquire the qualities of openness to new experiences. Charismatic teachers foster motivation to learn. The university is a period of time that specifically refines the ability to learn. Possible category gaps identified by participants were the lack of discipline and perseverance to finish the tasks they have started and the lack of sufficient motivation to

devote free time to additional study. In order to develop personal competences participants suggested exercising memory in an easy way can support learning skills, writing a diary or regularly reflecting on yourself. Focus on what has brought you closer and what has distanced you from achieving a particular goal and benefiting from the guidance: mentoring, coaching, including constructive criticism. They also suggested to go beyond patterns, and established ways of doing things. When carrying out a new task, it is worth stopping, thinking and only later making a decision. It is also worth surrounding yourself with ambitious and active people.

Participants in Poland also chose **decision making** since they are a trait of a leader. They are linked to the creation of structures and rules in which a project or team will be able to function. They require self-confidence, awareness of the consequences of one's own actions, independence, speed of action, and assertiveness. In early life, decision-making develops in a favourable environment in which the child can make decisions and suffer the consequences. During the school period, playing games and participating in sports support decision-making. At the university, various projects and challenges give the ability to learn in a safe testing environment, with no consequences in the real world. Participants identified category gaps when there is a lack of ability to say "no" in situations when respondents agree to further tasks, although they don't want to or have trouble completing them (e.g. lack of time) and succumbing to pressure from a more powerful partner and being unable to confront. They also identified a problem with decision-making in a situation with many equivalent options. In order to develop this category, participants listed several different learning paths. For example, play strategy games that show the consequence of the choices made. do sports in which you have to decide on a strategy during the game, learn by analysing the experiences of others in a particular workplace or in a particular position and get to know the company 'from the inside' and analyse various past situations and learn from mistakes and the consequences of your decisions (both good and bad).

The last category discussed during the focus group was **communication and networking** since they believe communication and the ability to make connections enable social functioning and proper relationships at work or university. People able to communicate are more cooperative. Respondents learned to communicate during team games, training, and social gatherings. The latter teach a different type of communication than in school/work, where it is usually rigid and robotic. Skills are most affected when going into a new environment. They also identified that introverted personality traits make it difficult to relate freely to others and to be around other people. This may be understood as separation or inaccessibility. Also, language barriers and lack of understanding of cultural codes and stereotypical perceptions of the nationalities and habits of people from other countries. They also suggested that for the development of the category to practice listening skills and show empathy to the other person, play team games - social, sports - any that favour cooperation over competition, work in project teams helps you meet new people and communicate with them effectively enough to achieve common goals and do internships since they allow to gain experience in communicating in an unfamiliar environment.

5.3.2 APP design feedback

Participants in general provided examples of applications or competency tests that respondents are familiar with include personality quizzes on the Internet, DISC personality colours, the Fabulous application, Sam Harris's Waking Up application. Respondents are very fond of receiving feedback from the apps, especially motivational positive feedback. They also listed some aspects they **dislike**:

- The apps show what to change, but don't tell you how to do it or describe it too generally.
- The ability to manipulate the results by choosing particular answers.
- Lack of context for the questions, making it difficult to choose a specific answer.
- Lack of a proper scale, forcing extreme answers (e.g., *Yes/No/I don't know*), which makes it impossible to give a real answer.
- Tests with a very large number of questions, for which you need to spend a lot of time.
- Lack of intuitive navigation of the application, when *"every function has to be searched for."*
- Ads and pop-ups distract users' attention.

Motives for usage participants mentioned:

- Self-assessment. Respondents get a clear picture of their skills.
- Self-improvement. Respondents would also get a series of methods to improve their skills, followed by further measurement and the ability to track their progress.
- Sharing with friends is accepted only as a form of fun or motivation.
- Showing the performance matrix to the employer, but it is necessary to describe the competencies so that the employer would know what skills are included.
- Employee evaluation. The app could be useful for annual interviews and would allow the employer to develop its employees.
- Recruitment, the app should be protected against possible 'whitewashing' of the user.
- Job search. Connect the app with job.co.uk or LinkedIn, and place a matrix next to the profile so that recruiters can check a person's competencies

Regarding **functionalities/features** would that would make the app valuable and personalised they recommended:

- Credibility and theory-based. Scientific evidence should be provided.
- Interactivity. Reading the story in the app and responding how you would react in a given situation. This would distinguish the app from other quizzes or personality tests.
- Assigning competencies to professions. Consider displaying profiles of famous people.
- Strategy. It should be a comprehensive way to improve or provide hints on how to develop missing skills by including links to articles, courses, training, and communication with others.
- Coaching. Providing advice on the possibility of developing specific competencies.
- Social media communication. People with accounts on the app will be able to talk about tasks, and tests completed, and share tips or advice not found on the app.
- Motivating users. Track the effects of work (charts, reports, statistics, …), regular exercises, and notifications for maintaining user discipline.
- An in-app smart calendar calculates the deadline after entering the goal and the amount of time you want to spend on a particular activity each day.
- Peer comparison. Members support anonymous ranking and light competition in terms of improving skills but do not approve of competition in terms of diagnosis as this may lead some users to feel inferior and discouraged from continuing their education.
- Rewards. Collecting points, emoticons, flags, or other rewards is motivating.

Participants also made suggestions for **design**:

- Intuitiveness and ease of navigation in the application. The app needs to be tested and improved before implementation to catch complexities, misunderstandings, and problems.
- Appropriate graphic design includes simplicity, a consistent and clearly distinguishable colour scheme, and an interesting, intriguing logo.
- Use the competence wheel like a "cake". Individual pieces can open up and expand, presenting tests, tasks, etc.
- Personalized view. Bringing the skills you want to improve to the top.
- Marketing. A convincing description of the app will encourage people to download it.
- Personal data should be well protected.
- Low price. Preferably free, and no ads, and if they had to appear they should be small.

5.4 SLOVENIA

Partner Institution:	University of Ljubljana, School of Economics and Business		
Date of the Focus Group:	May 23, 2023	May 29, 2023	May 30, 2023
Moderator(s):	Katarina Katja Mihelič, Melita Blas Rant, Aleš Toman		
Number of Participants:	6	6	6
Duration:	110 minutes	105 minutes	90 minutes

5.4.1 Learning paths for selected categories

Participants in three focus groups in Slovenia selected the next categories: flexible, personal, decisions, ways to create, collaboration, network + communication, thinking, values and digital skills as important ones and provided possible learning paths to develop each category.

Participants believe that they are **flexible** because they can easily reschedule obligations. They must always be prepared for inconveniences. One participant said that resilience is probably one of the most essential skills in sports. Because there are always ups and downs, and you have to be resilient to keep going despite bad results.

One participant reported learning **leadership skills** in a student organisation. They gained confidence in public speaking, learned how to delegate people, and how to plan tasks. Another emphasized that it also depends on each individual how committed they are to taking on a leadership role. They need to have confidence in themselves and gain as much experience as possible. To transfer leadership skills to colleagues, you should gradually give them some more responsibility, stand by them, and motivate them.

One participant said they have had good **organisational skills** all their life because they have always liked to set goals. They feel responsible for their results and strictly follow the rules they set. One participant acquired their organizational skills by watching videos on YouTube, reading the news, and asking colleagues about their experiences. All participants said they learned the skills by doing the work themselves. Another participant used bullet journaling to gain the skill.

Participants learned **self-management**, especially **time management**, when they had to effectively balance their study commitments with sports, musical activities, and the need for leisure time. They also learned to prioritize various commitments when the time was short.

One participant noted that because of an unbalanced priority list, some activities suffered a bit. Participants noted that time management skills develop with experience or by learning from mistakes. One participant significantly improved their skills by keeping a calendar. Another emphasized the importance of knowing how much time a particular activity would take.

Participants believe that with respect to **personal development** category, commitment to lifelong learning is demonstrated by engaging in many activities and being exposed to different things. One participant noted that self-reflection is also an ongoing process that comes into focus whenever one is at a crossroads and needs to discover one's interests. Another participant admitted that they have a negative attitude toward self-reflection because they constantly fail to improve the weaknesses they have identified. One participant developed their openness through their part-time job in a restaurant. Several participants noted that their involvement in sports helped them become more open to different characters on the team. One participant sees openness in terms of being open to different activities and saw volunteering and working with children as beneficial.

Regarding decisions category, participants acquired **decision-making skills** through a computer game and another by setting a deadline by which the decision must be made, even if there are no external deadlines. For one participant, travel helped develop the ability to work independently. Another emphasized the importance of students being able to work without help.

One participant made a strong connection between **creativity** and artistic ability. Others explained that they get creative ideas from conversations with friends and colleagues, problem-solving, travel, and observing creative people.

For **collaboration category**, all participants consider teamwork a source of diverse ideas, but added that communication and distributed contributions are critical to success. Several participants learned teamwork when they participated in team sports. They noted that being a team leader can teach you how to motivate others. One participant emphasized that teamwork only works when all members are on the same location. Several participants reported problems with teamwork due to a lack of flexibility, a feeling of not having control, and also due to challenges they had experienced in the past. They reported that working in random groups improved teamwork and creativity. One participant learned how to work in a diverse team during an exchange, and another learned as a member of the student association of people studying in different fields. Participants noted that the mixed team must have a common goal because just being together is not enough to learn.

One participant noted that **public speaking and presentation** skills require the ability to infer people's opinions from nonverbal signs and persuade them to change their minds. The participant learned this during a student job in a restaurant. Another learned this skill in a student organization and found the support of people with similar interests valuable. Another participant emphasized the role of team sports. One participant added that this skill needs to be practiced constantly, observing that it has deteriorated during pandemics.

Network + communication was the next category participants in a focus group selected as an important category. Participants noted that they gained their **networking skills** during exchanges, student work, and in various clubs and associations. One participant said that it is in the interest of young members to connect with older members of the club. One participant explained the approach used in networking. It involves having some general knowledge and using that knowledge to convince the other side that it is worth knowing the speaker. Participants cited traveling, meeting other people, and learning about their culture as a way to gain **intercultural skills** and practice a foreign language.

Thinking and reasoning was the next category participants identified as an important one. Participants developed critical thinking skills by reading books and news, and by talking with friends, family, and colleagues. One participant mentioned that they do not watch movies or listen to music to help them concentrate and think critically better. One participant mentioned that not trusting authority and following the crowd help them develop critical thinking skills. Participants learned problem-solving by facing problems and also reading what other people have gone through. One participant learned analytical and logical thinking through practice and experience, reading reference books, and talking to professionals, but also emphasized the role of formal education. Another participant reported having difficulty with anything abstract.

With respect to **integrity**, participants noted that spending more time in nature makes them more responsible and environmentally aware. Several participants mentioned that moving away from home made them more responsible. Another noted that as an only child with busy parents, they have always been responsible. Several participants felt responsible when other people trusted them or when they had to present the work done by a group. Several participants noted that formal trustworthiness (a lifeguard and a sports coach) is the result of demanding training and testing. Others noted that personal trustworthiness is achieved when people confide in you with their problems and are not ashamed. They emphasized active listening, looking each other in the eye, and not judging. Participants believe values are related to upbringing, the books one has read, and the media one has consumed over the years. Conversations with friends and family can improve skills later in life. In terms of the ethical approach, one participant noted that they try to evaluate every decision they make in terms of ethics, but it is quite difficult because ethics is quite abstract. Another noted that disputes about ethics can be resolved by showing a little more empathy.

Digital proficiency was the last category participants in Slovenian focus groups identified as important one. Participants learned digital skills by watching various videos on YouTube, reading tutorials, or talking to friends who were more knowledgeable about the topic.

Participants were asked in general how they could tell that their skills were improving over time. Responses included lower stress levels and better results. They stressed the importance of reflecting on things that went wrong in the past and learning from mistakes.

5.4.2 APP design feedback

Participants in focus groups in general supported the idea because they like to track their habits. Several participants use Duolingo and are excited about the performance tracking features, but some participants consider it more of a game than a professional learning tool. Participants use LinkedIn and are familiar with the competency's functionalities. They think that self-assessment leads to a bias in the result. Another believes that competencies should be based on verifiable certificates. One participant only uses apps with clear added value.

Regarding **motives** for usage the participants noted that the app would encourage competition among peers and give users ideas for new learning opportunities. If the app is recognised by companies and used in the hiring process, it would shorten job interviews because various skills are already objectively measured. The app should be promoted in the university and be able to be linked to social media such as LinkedIn. They also noted that they have several considerations for not using the app. For example, one participant is not sure how developers can gain their trust. Another would like to know who is evaluating their skills. One would like some control over what users upload. Another would stop using the app if there was no feedback after all materials were uploaded. They also expressed several concerns. How would

watching YouTube videos be certified, what about talent? They saw a great incentive to take everything to the extreme and have the best skills on your CV. They noted that when evaluating soft skills, even experts could be subjective. They acknowledged that while points and badges can be motivating, they can also tempt people to cheat if the application is used for interviews. The appropriate level of gamification could be determined by surveying the users of this or a related application. One participant mentioned privacy concerns and suggested encrypting the information.

In terms of **functionalities/features** that would make the app valuable and personalised participants suggested that the app must be objective and not give false positive feedback. The app should also include some tests. It should allow for competition, different levels, and constant reminders. Notifications could indicate what other users have achieved or added, they could indicate new training depending on what skills the individual user is still lacking. The app should include a checklist of what is needed to advance to the next level. The app should have a clear meaning. It should contain different skills for different jobs, but also a comprehensive analysis and description of how the skills have evolved over time. The app should provide the ability to export the profile and certificates to attach to a CV. Since many people do not know how to improve their skills, the application should provide personalized information about training or activities that could improve individual skills. The application should provide a chat room where users can share their opinions and ask questions that can be answered by a chatbot. The app should allow team members to rate each other's work after the project is completed. Several participants said the app should stimulate communication between people and companies and match the entrepreneur with a suitable candidate.

Participants in the focus groups also had some suggestions for **design**. External validation within the app should be done by experts in the field (professors, mentors, bosses), based on psychology, and using transparent and reliable technology. It must be known who the author of the app is, for what purpose it was developed, and who funded the development. The app should provide a good user experience. Notifications should encourage regular use of the app, and the app should also allow individuals to measure their progress over time. The app should be very broad and cover all areas of an individual's activities. Participants disagreed on pricing. Some felt that a paid app would be more widely used and therefore more noticed, while a paid app would be taken more seriously by users.

5.5 SUMMARY OF MAIN FINDINGS

Participants described themselves as **flexible** people, able to deal with inconveniences and changes in schedule. Their experiences in sports gave them a sense of resilience, a crucial quality in dealing with the fluctuating dynamics of sports and life in general.

Leadership and organization were gained in a variety of contexts, from student organizations to self-directed goal setting. Delegating and planning tasks were identified as key elements of leadership. In addition, personal initiative and responsibility were associated with strong organizational skills. Participants also emphasized the importance of learning through experience.

Participants believe that **personal development** is critical to both personal and professional development. They emphasized the need to be adaptable in a world of rapidly changing

technologies. Motivation to acquire knowledge stemmed from curiosity about the world, a supportive environment, and enthusiastic teachers.

Participants related **decision-making** to leadership. This skill requires self-confidence, independence, assertiveness, and an understanding of the consequences of one's actions. Decision-making was promoted through a variety of means, including games and travel. Difficulty in decision-making was associated with reluctance to refuse tasks and decision paralysis in complex situations with similar alternatives.

Creativity/Ways to create was most frequently associated with artistic skills, and observing creative individuals.

Collaboration as a platform for a diversity of ideas requires effective communication and balanced contributions. Participants acquired collaboration skills through team sports, working in diverse groups, and student organizations. Public speaking and presentation skills were enhanced through various experiences, including part-time jobs, student organizations, and team sports.

Participants developed **communication and networking** through exchanges, student jobs, clubs, and associations. The importance of general knowledge in building connections was emphasized. Networking and communication challenges were associated with introverted personality traits, language barriers, and cultural misunderstandings.

Critical thinking was developed through reading, discussion, and questioning authority. Participants improved their problem-solving skills by dealing with problems and gaining insights from the experiences of others. The development of analytical and logical thinking was attributed to practice, reading, professional consultation, and formal education.

Participants related personal **integrity** to a variety of experiences and influences. Spending time in nature, moving away from home, and taking on responsibilities at a young age were some experiences that shaped their values. Trustworthiness was associated with active listening, eye contact, and a non-judgmental attitude. Participants acknowledged that ethical decisions can be challenging because of the abstract nature of ethics.

Digital proficiency was learned primarily through watching YouTube videos. The importance of digital skills in today's society was recognized, although learning methods were largely self-directed.

While users appreciate the skills-tracking features, they express concerns about self-assessment bias and the need for a verifiable validation system. The app should be straightforward, career-oriented, and promoted early in students' academic careers. However, to maintain professionalism, excessive social media presence is discouraged. The app is expected to promote light competition, provide new learning opportunities, and facilitate self-assessment and self-improvement. Users expect personalized feedback on their progress, but express concerns about trust, privacy, the possibility of cheating, and the subjectivity of soft skills assessment.

Users expect detailed skills analysis over time, CV integration, interactive chatbot features, and a matching system between job seekers and companies. The app should provide an engaging user experience, encourage regular use, and facilitate visualization of progress. Achievement badges, social media, success stories, and course and event recommendations are expected to further increase user engagement and personalize the experience. Pricing led to divided opinions among users. Some advocated for a low-cost or free app, while others suggested that a paid version could ensure more serious engagement.

6. REFERENCES

Abbasi, F. K., Ali, A., & Bibi, N. (2018). Analysis of skill gap for business graduates: Managerial perspective from banking industry. Education + Training, 60(4), 354–367.

Abelha, M., Fernandes, S., Mesquita, D., Seabra, F., Ferreira-Olveira, A.T. (2020) Graduate Employability and Competence Development in Higher Education—A Systematic Literature Review Using PRISMA. Sustainability, 12, 5900.

Adib-Hajbaghery, M., & Lotfi, M. (2018). Communication skills of nursing students: Assessing the relationship between self-efficacy and assertiveness. Journal of Education and Health Promotion, 7, 60. doi: 10.4103/jehp.jehp_8_17

Akcay, B. (2009). Problem-Based Learning in Science Education. *Journal of Turkish Science Education*, *6*.

Alain, F. (2007). Entrepreneurship and New Value Creation – The Dynamic of the Entrepreneurial Process Cambridge. *Entrepreneurship and New Value Creation: The Dynamic of the Entrepreneurial Process*. https://doi.org/10.1017/CBO9780511488689

Alberti, R. E., & Emmons, M. L. (2008). Your perfect right: Assertiveness and equality in your life and relationships. Impact Publishers.

Alexander, 1.T., & Cooperland, A.S. (1965). *System training and research in team behavior* (TM-258I ; DTIC No. AD620606). Santa Monica, CA: System Develop- ment Corporation.

Antin, J., & Churchill, E. (2011). Badges in Social Media: A Social Psychological Perspective. In *Gamification Workshop Proceedings*.

Armenakis, A. A., & Bedeian, A. G. (1999). Organizational change: A review of theory and research in the 1990s. Journal of Management, 25(3), 293-315.

Attridge, N., Aberdein, A., & Inglis, M. (2016). Does studying logic improve logical reasoning? https://repository.lboro.ac.uk/articles/conference_contribution/Does_studying_logic_improve_logical_reasoning_/9373463/1

Azevedo, A., Apfelthaler, G., & Hurst, D. (2012). Competence Development in Business Graduates: An Industry-driven Approach for Examining the Alignment of Undergraduate Business Education with Industry Requirements. *The International Journal of Management Education*, *10*, 12–28. https://doi.org/10.1016/j.ijme.2012.02.002

Bailin, S., Case, R., Coombs, J. R., & Daniels, L. B. (1999). Conceptualizing critical thinking. Journal of Curriculum Studies, 31(3), 285–302. https://doi.org/10.1080/002202799183133

Bakker, B. N., & de Vreese, C. H. (2016). Personality and European Union attitudes: Relationships across EU attitude dimensions. *European Union Politics, 17*(1), pp. 25-45.

Barak, M., & Levenberg, A. (2016). Flexible thinking in learning: An individual differences measure for learning in technology-enhanced environments Computers & Education. http://dx.doi.org/10.1016/j.compedu.2016.04.003

Başerer, D. (2020). Logical Thinking Levels of Teacher Candidates. Educational Policy Analysis and Strategic Research, 15(4), 176–190. https://doi.org/10.29329/epasr.2020.323.10

Beer, M. (1976). The technology of organization develop- ment. In M. D. Dunnette (Ed.), *Handbook of industrial and organiational psychology* (pp. 937–994). Chicago, IL: Rand McNally.

Beetham, H., & Sharpe, R. (2013). *Rethinking pedagogy for a digital age: Designing for 21st Century Learning*.

Beltrán-Martín, I., & Roca-Puig, V. (2013). Promoting employee flexibility through HR practices. Human Resource Management, September–October 2013, Vol. 52, No. 5. Pp. 645–674. DOI:10.1002/hrm.21556

Ben-Ner, A. and Halldorsson, F. (2010) Trusting and trustworthiness: What are they, how to measure them, and what affects them. Journal of Economic Psychology, Vol 31. pp. 64–79 doi:10.1016/j.joep.2009.10.001

Bennett, J. M. (2008). On becoming a global soul. In V. Savicki (Ed.), Developing intercultural competence and transformation: Theory, research and application in international education (pp. 13-31). Sterling: Stylus.

Bennett, M. J. (1993). Towards ethnorelativism: A developmental model of intercultural sensitivity. In M.R. Paige (Ed.), Education for the intercultural experience (pp. 27-58). Yarmouth: Intercultural Press.

Berg, J., Dickhaut, J., and McCabe, K. (1995). Trust, reciprocity, and social history. Games and Economic Behavior, Vol 10, pp. 122–142. https://doi.org/10.1006/game.1995.1027

Bergersen, G. R., Hannay, J. E., Sjoberg, D. I., Dyba, T., & Karahasanovic, A. (2011). Inferring skill from tests of programming performance: Combining time and quality. In *2011 international symposium on empirical software engineering and measurement* (pp. 305-314). IEEE.

Bergersen, G. R., Sjøberg, D. I., & Dybå, T. (2014). Construction and validation of an instrument for measuring programming skill. *IEEE Transactions on Software Engineering*, *40*(12), 1163-1184.

Bhattacharya, M., Gibson, D. E., & Doty, D. H. (2005). The Effects of Flexibility in Employee Skills, Employee Behaviors, and Human Resource Practices on Firm Performance Journal of Management, Vol. 31 No. 4, August 2005 1-19 DOI: 10.1177/0149206304272347

Boahin, P., & Hofman, W. (2013). A disciplinary perspective of competency-based training on the acquisition of employability skills. *Journal of Vocational Education & Training*, *65*, 385–401. https://doi.org/10.1080/13636820.2013.834954

Bocconi, S., Chioccariello, A., Dettori, G., Ferrari, A., Engelhardt, K., Kampylis, P., & Punie, Y. (2016). Developing computational thinking in compulsory education. *European Commission, JRC Science for Policy Report*, *68*.

Bogdány, E., Cserháti, G., & Dabrónaki-Priszinger, K. (2021). Analysis of gap between competencies developed by higher education and required by employers in Hungary. In Proceedings of the first GiLE4Youth International Conference: The Development of Competencies for Employability (pp. 51-62). GiLE Journal of Skills Development. https://doi.org/10.56611/conf.proc.2021.1.51-62

Bolzani, D., & Luppi, E. (2020). Assessing entrepreneurial competences: Insights from a business model challenge. *Education + Training*, *63*(2), 214–238. https://doi.org/10.1108/ET-04-2020-0072

Bowes, L., Jaffee, S. (2013): Biology, genes, and resilience: Toward a multidisciplinary approach. Trauma, Violence, & Abuse, 14 (3), pp. 195-208

Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2007). Individual differences in adult decision-making competence. Journal of Personality and Social Psychology, 92(5), 938-956. doi: 10.1037/0022-3514.92.5.938

Bruine de Bruin, W., Parker, A. M., & Fischhoff, B. (2020). Decision-Making Competence: More Than Intelligence? Current Directions in Psychological Science, 29(2), 186–192. https://doi.org/10.1177/0963721420901592

Burt, C. D. B., & Kemp, S. (1994). Construction of activity duration and time management potential. *Applied Cognitive Psychology*, *8*, 155–168. https://doi.org/10.1002/acp.2350080206

Byram, M. (1997). Teaching and assessing intercultural communicative competence. Clevedon: Multilingual Matters.

Cambra-Fierro, J., & Cambra-Berdún, J. (2007). Students' self-evaluation and reflection (part 1): “measurement”. *Education + Training, 49*(1).

Cambridge Dictionary (n. d.) Flexibility retrieved on 05.06.2023. from https://dictionary.cambridge.org/dictionary/english/flexibility

Carchiolo, V., Longheu, A. and Malgeri, M. (2010) Reliable peers and useful resources: Searching for the best personalised learning path in a trust- and recommendation-aware environment. Information Sciences, Vol. 180, No. 10, pp 1893-1907, ISSN 0020-0255, https://doi.org/10.1016/j.ins.2009.12.023.

Casilli, C., & Hickey, D. (2016). Transcending conventional credentialing and assessment paradigms with information-rich digital badges. *The Information Society*, *32*, 117–129. https://doi.org/10.1080/01972243.2016.1130500

CBS (2022). Dutch digital skills at the top in Europe. https://www.cbs.nl/en-gb/news/2022/19/dutch-digital-skills-at-the-top-in-europe

CEDEFOP (2016). The Netherlands: Mismatch priority occupations. https://www.cedefop.europa.eu/en/data-insights/netherlands-mismatch-priority-occupations

CEDEFOP (2023). European Skills and Jobs Survey. Available at https://www.cedefop.europa.eu/en/tools/european-skills-jobs-survey/data/explorer?country=EU27&field12=A42&indicator=_ET135#1

Cela-Ranilla, J. M., Esteve-Mon, F. M., Esteve-González, V., & Gisbert-Cervera, M. (2014). Developing self-management and teamwork using digital games in 3D simulations. *Australasian Journal of Educational Technology*, *30*(6), Article 6. https://doi.org/10.14742/ajet.754

Center for Creative Leadership. (2022, April 10). *The Leadership Gap: How to Fix What Your Organization Lacks*. https://www.ccl.org/articles/leading-effectively-articles/leadership-gap-what-you-still-need/

Chan, V. (2011). Teaching oral communication in undergraduate science: Are we doing enough and doing it right? *Journal of learning design, 4(3), 71–79.*

Cheng, Z., Richardson, J. C., & Newby, T. J. (2020). Using digital badges as goal-setting facilitators: A multiple case study. *Journal of Computing in Higher Education*, *32*(2), 406–428. https://doi.org/10.1007/s12528-019-09240-z

Cheng, Z., Watson, S. L., & Newby, T. J. (2018). Goal Setting and Open Digital Badges in Higher Education. *TechTrends*, *62*(2), 190–196. https://doi.org/10.1007/s11528-018-0249-x

Chiang, C.-L., & Lee, H. (2016). The Effect of Project-Based Learning on Learning Motivation and Problem-Solving Ability of Vocational High School Students. *International Journal of Information and Education Technology*, *6*, 709–712. https://doi.org/10.7763/IJIET.2016.V6.779

Chmielewski, M. S., & Morgan, T. A. (2013). Five-Factor Model of Personality. In: *Gellman, M.D., Turner, J.R. (eds) Encyclopedia of Behavioral Medicine.* Springer, New York, NY.

Claessens, B. J. C., van Eerde, W., Rutte, C. G., & Roe, R. A. (2007). A review of the time management literature. *Personnel Review*, *36*(2), 255–276.

Conger, J. A. (1998). The necessary art of persuasion. *Harvard Business Review*, *76*, 84-97.

Connelly, D., & Rotella, R. J. (1991). The social psychology of assertive communication: Issues in teaching assertiveness skills to athletes. *The sport psychologist*, *5*(1), 73-87.

Cox, J. (2004). How to identify trust and reciprocity. Games and Economic Behavior, Vol. 46, pp. 260–281 https://doi.org/10.1016/S0899-8256(03)00119-2

Crick, D. R., Broadfoot, P., & Claxton, G. (2004). Developing an effective lifelong learning inventory: The ELLI project. *Assessment in Education, 11*, pp. 247-271.

Cummins, S., & Johnson, J. S. (2023). The Impact of Live Cases on Student Skill Development in Marketing Courses. *Journal of Marketing Education*, *45*(1), 55–69.

Davies, L., & Read, A. (2005). Globalising citizenship education? A critique of 'global education' and 'citizenship education'. *British Journal of Educational Studies, 53*(1), 66–89.

De Janasz, S. C., & Forret, M. L. (2008). Learning The Art of Networking: A Critical Skill for Enhancing Social Capital and Career Success. *Journal of Management Education, 32*, 629–650. https://doi.org/10.1177/1052562907307637

Del Missier, F., Mantyla, T., & Bruine de Bruin, W. (2010). Executive functions in decision making: An individual differences approach. Thinking and Reasoning, 16(2), 69-97.

Deloitte. (2016). *The new organization: Different by design* (Global Human Capital Trends 2016). https://www2.deloitte.com/us/en/insights/focus/human-capital-trends/2016.html

Denny, P. (2013). The effect of virtual achievements on student engagement. In *Proceedings of the SIGCHI conference on human factors in computing systems* (p. 772). https://doi.org/10.1145/2470654.2470763

Dewantara, H., & Ismaniar, I. (2021). Logical Thinking Improvement in Children Aged 5 to 6 Years Through Pop-Up Book. SPEKTRUM: Jurnal Pendidikan Luar Sekolah (PLS), 9(3), Article 3. https://doi.org/10.24036/spektrumpls.v9i3.113718

Du Boulay, B. (1989). Some difficulties of learning to program. In E. Soloway & J.C. Spohrer (Eds.), Hillsdale, NJ: Lawrence Erlbaum.

Duran, R. S., Rybicki, J. M., Hellas, A., & Suoranta, S. (2019). Towards a common instrument for measuring prior programming knowledge. In *Proceedings of the 2019 ACM Conference on Innovation and Technology in Computer Science Education* (pp. 443-449).

Dweck, C. S. (2016). *Mindset. The New Psychology of Success. How We Can Learn To Fulfill Our Potential*, Ballentine Books, New York

Dwyer, C. P., Hogan, M. J., & Stewart, I. (2014). An integrated critical thinking framework for the 21st century. Thinking Skills and Creativity, 12, 43–52. https://doi.org/10.1016/j.tsc.2013.12.004

Edeling, S., & Pilz, M. (2016). Teaching self- and social competencies in the retail sector: Findings from vocational schools in Germany, Italy and Poland. *Education + Training*, *58*, 1041–1059. https://doi.org/10.1108/ET-07-2015-0060

Ehlers, U.-D. (2020). *Future Skills The future of learning and higher education*. Springer. Available from: https://nextskills.org/wp-content/uploads/2020/03/Future-Skills-The-Future-of-learning-and-higher-education.pdf.

Eilam, B., & Aharon, I. (2003). Student planning in the process of self-regulated learning. *Contemporary Educational Psychology*, *28*, 304–334. https://doi.org/10.1016/S0361-476X(02)00042-5

Englehardt, C. S., & Simmons, P. R. (2002). Organizational flexibility for a changing world. Leadership and Organization Journal 23/3 113-121 https://www.emerald.com/insight/content/doi/10.1108/01437730210424057/full/pdf?title=organizational-flexibility-for-a-changing-world

Erbay, E., & Akçay, S. (2013). Assertiveness skill of social work students: A case of Turkey. *Academic Research International*, *4*(2), 316.

European Commission (n.d.). *DigComp Framework*. (n.d.). Retrieved March 28, 2023, from https://joint-research-centre.ec.europa.eu/digcomp/digcomp-framework_en.

European Commission. (2017). The Digital Competence Framework 2.1: A European Framework for the Digital Competence of Citizens. Retrieved from https://publications.jrc.ec.europa.eu/repository/handle/JRC106281.

Faja, S. (2013). Collaborative learning in online courses: Exploring students perceptions. *Information Systems Education Journal, 11*(3), 42.

Feron, E., & Schils, T. (2020). A Randomized Field Experiment Using Self-Reflection on School Behavior to Help Students in Secondary School Reach Their Performance Potential. *Frontiers in Psychology, 11.*

Finn, J. D., & Rock, D. A. (1997). Academic success among students at risk for school failure. Journal of Applied Psychology, 82(2), 221–234. https://doi.org/10.1037/0021-9010.82.2.221

Fitrawati, F., Syarif, H., Zaim, M., Perrodin, D., & Zakiyah, M. (2022). Digital Literacy: Students' Perception toward Advanced Grammar Interactive E-Books in the English Department of Universitas Negeri Padang. *International Journal of Language Pedagogy, 2*(2).

Flores, K. L., Matkin, G. S., Burbach, M. E., Quinn, C. E., & Harding, H. (2012). Deficient critical thinking skills among college graduates: Implications for leadership. Educational Philosophy and Theory, 44(2), 212-230.

Forret, M. L., & Dougherty, T. W. (2004). Networking Behaviors and Career Outcomes: Differences for Men and Women? *Journal of Organizational Behavior, 25*(3), 419–437.

Forret, M., & Dougherty, T. (2001). Correlates of Networking Behavior for Managerial and Professional Employees. *Group & Organization Management - GROUP ORGAN MANAGE, 26,* 283–311. https://doi.org/10.1177/1059601101263004

Freeman, R. E. (1991) Business Ethics: The State of the Art. Oxford University Press, New York

Gambrill, E. D., & Richey, C. A. (1975). An assertion inventory for use in assessment and research. *Behavior Therapy, 6,* 550–561.

García-Álvarez, J., Vázquez-Rodríguez, A., Quiroga-Carrillo, A., & Priegue Caamaño, D. (2022). Transversal Competencies for Employability in University Graduates: A Systematic Review from the Employers' Perspective. *Education Sciences*, *12*(3), Article 3. https://doi.org/10.3390/educsci12030204

García-Aracil, A., & Van der Velden, R. (2008). Competencies for young European higher education graduates: Labor market mismatches and their payoffs. *Higher Education*, *55*, 219–239.

Garmezy, N. (1985). Stress-Resistant Children: The Search for Protective Factors. In J. E. Stevenson (Ed.), Recent Research in Developmental Psychopathology: Journal of Child Psychology and Psychiatry Book Supplement (pp. 213–233.). Oxford: Pergamon.

Garrick, B., Pendergast, D., & Geelan, D. (2017). *Personalised Learning, Pedagogy, and E-mediated Tools* (pp. 27–46). https://doi.org/10.1007/978-981-10-2700-0_3

Gee, V., & Gee, S. (2011). *Business improv: Experiential learning exercises to train employees to handle every situa- tion with success.* New York, NY: McGraw-Hill.

Gibson, C., Hardy, J., & Buckley, M. (2014). Understanding the role of networking in organizations. *Career Development International, 19*. https://doi.org/10.1108/CDI-09-2013-0111

Gibson, D., Ostashewski, N., Flintoff, K., Grant, S., & Knight, E. (2013). Digital badges in education. *Educ Inf Technol*, *20*, 1–8. https://doi.org/10.1007/s10639-013-9291-7

Gilbert, D. R. (1997) Ethics Through Corporate Strategy. Oxford University Press, New York

Gilster, P. (1997). *Digital literacy.* Wiley Computer, New York.

Gleaves, A., Walker, C., & Grey, J. (2008). Using digital and paper diaries for assessment and learning purposes in higher education: A case of critical reflection or constrained compliance? *Assessment and Evaluation in Higher Education, 33*(3), pp. 219–231.

Goldberg, L. R. (1992) The development of markers for the big-five factor structure. *Psychological Assessment 4*(1), pp. 26–42.

Goligoski, E. (2012). Motivating the Learner: Mozilla's Open Badges Program. *Access to Knowledge*, *4*.

Gopinathan, S., Kaur, A. H., Veeraya, S., & Raman, M. (2022). The role of digital collaboration in student engagement towards enhancing student participation during COVID-19. *Sustainability, 14*(11), 6844.

Grant, S. (2016). *History and Context of Open Digital Badges* (pp. 3–11).

Granziera, H., Colli, R. J., & Martin, A. J. (2019). Adaptability: An important capacity to cultivate among pre-service teachers Psychology Teaching Review Vol. 25 No. 1, 2019

Greenberg, M. (2006): Promoting resilience in children and youth: Preventive interventions and their interface with neuroscience. Annals of New York Academy of Sciences, 1094 (2006), pp. 139-150

Griffin, P., & Care, E. (2014). Assessment and teaching of 21st century skills: Methods and approach. Dordrecht, Netherlands: Springer.

Grim, A.M. (2010). Use of Situational Judgment Test to Measure Individual Adaptability in Applied Settings.

Guo, J. (2019). The use of an extended flipped classroom model in improving students' learning in an undergraduate course. *Journal of Computing in Higher Education*, *31*, 362–390. https://doi.org/10.1007/s12528-019-09224-z

Gurbuz, S. C., & Celik, M. (2022). Serious games in future skills development: A systematic review of the design approaches. *Computer Applications in Engineering Education*, *30*(5), 1591–1612. https://doi.org/10.1002/cae.22557

Halualani, R.T., Chitgopekar, A., Morrison, J.H.T.A., & Dodge, P.S.-W. (2004). Who's interacting? And what are they talking about? – Intercultural contact and interaction among multicultural university students. *International Journal of Intercultural Relations, 28*(5), 353–372.

Hammer, M. R., Bennett, M. J., & Wiseman, R. (2003). Measuring intercultural sensitivity: The intercultural development inventory. *International Journal of Intercultural Relations, 27*(4), 421–443.

Hamtiaux, A., Houssemand, C,& Vrignaud, P., (2013). Individual and career adaptability: Comparing models and measures. Elsevier: Journal of Vocational Behavior http://dx.doi.org/10.1016/j.jvb.2013.03.006

Hart, A., & Heaver, B. (2013). Evaluating resilience-based programs for schools using a systematic consultative review. Journal of Child and Youth Development, 1(1), 27–53.

Hayden, M., & Wong, C. S. D. (1997). The International Baccalaureate: International education and cultural preservation. *Educational Studies, 23*(3), 349–361.

Hill, S., Ionescu-Somers, A., Coduras, A., Guerrero, M., Azam Room, M., Bosma, N., Sahasranamam, S., & Shay, J. (2022). *Global Entrepreneurship Monitor 2021/2022 Global Report: Opportunity Amid Disruption*. Global Entrepreneurship Research Association, London Business School.

Hiller, G.G., & Wozniak, M. (2009). Developing an intercultural competence programme at an international cross-border university. *Intercultural Education, 20*(4), 113–124.

Hinrichs, J. (2003). A comparison of levels of international understanding among students of the International Baccalaureate diploma and Advanced Placement programs in the USA. *Journal of Research in International Education, 2*(3), 331–348.

Hinyard, L., Toomey, E., Eliot, K., & Breitbach, A. (2019). Student perceptions of collaboration skills in an interprofessional context: Development and initial validation of the self-assessed collaboration skills instrument. *Evaluation & the health professions, 42*(4), 450-472.

Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review, 16*(3), pp. 235–266.

Hofstede, G. (2011). *Dimensionalizing Cultures: The Hofstede Model in Context. Online Readings in Psychology and Culture, 2*(1). https://doi.org/10.9707/2307-0919.1014

Holmes, K., Marriott, L. and Randal, J. (2012), "Ethics and experiments in accounting: A contribution to the debate on measuring ethical behaviour", Pacific Accounting Review, Vol. 24 No. 1, pp. 80-100. https://doi.org/10.1108/01140581211221560

Homan, A. C., & Greer, L. L. (2013). Considering diversity: The positive effects of considerate leadership in diverse teams. *Group Processes & Intergroup Relations*, *16*(1), 105–125.

Hoppe, M. (2016). The entrepreneurship concept – a short introduction. *Högre Utbildning*, *6*, 95–108.

Hou, C., Wu, L., & Liu, Z. (2014). Effect of proactive personality and decision-making self-efficacy on career adaptability among Chinese graduates. Social Behavior and Personality: an international journal, 42(6), 903-912.https://doi.org/10.1787/b377fbcc-en.

Huber, C. R., & Kuncel, N. R. (2016). Does college teach critical thinking? A meta-analysis. *Review of Educational Research*, *86*(2), 431-468.

Ibragimova, E. & Bakulina, L. & Ibragimov, M. (2022). Problems of integration of classroom and extracurricular independent work of students. ARPHA Proceedings. 5. 621-633. 10.3897/ap.5.e0621.

Ibrahim, H., & Jaafar, A. (2017). The outcomes of work-integrated learning programmes: The role of self-confidence as mediator between interpersonal and self-management skills and motivation to learn. *Pertanika Journal of Social Sciences and Humanities*, *25*, 931–948.

Ibrahim, N. A., & Rajab, A. (2013). Assertiveness among undergraduates in a Malaysian public university: Implications towards improved employability. *Sains Humanika*, *65*(2), 15-24.

Ibrahim, N., Khairol Anuar, N. A., Mokhtar, M. I., Zakaria, N., Jasman, N. H., & Rasdi, N. N. (2022). Exploring Fear of Public Speaking Through Social Cognitive Theory. *International Journal of Academic Research in Business and Social Sciences*, *12*(1), Pages 135-154.

Ingulsrud, J.E., Kai, K., Kadowaki, S., Kurobane, S., & Shiobara, M. (2002). The assessment of cross-cultural experience: Measuring awareness through critical text analysis. *International Journal of Intercultural Relations, 26*(5), 473–491.

Jackson, D. (2013). The contribution of work-integrated learning to undergraduate employability skill outcomes. *Asia-Pacific Journal of Cooperative Education*, *14*, 99–115.

Jackson, J. J., Hill, P. L., Payne, B. R., Roberts, B. W., & Stine-Marrow, E. A. L. (2012). Can an old dog learn (and want to experience) new tricks? Cognitive training increases Openness to Experience in older adults. *Psychology and Aging, 27*, pp. 286–292.

Jacobson, W., Sleicher, D., & Burke, M. (1999). Portfolio assessment of intercultural competence. *International Journal of Intercultural Relations, 23*(3), 467–492.

Jakóbczyk, J. (2023). Kluczowe kompetencje pracownika przyszłości. Pracownik 4.0 – przyszłość zaczyna się dziś. www.ey.com/pl_pl/workforce/kluczowe-kompetencje-pracownika-przyszlosci.

Johns, M. (2023, 23 June). Openness Personality Trait. Available from: https://www.thomas.co/resources/type/hr-blog/openness-personality-trait.

Jurakulovich, K. Z. (2021). The Requirements For Students's Independent Work. The American Journal of Social Science and Education Innovations, 3(01), Article 01. https://doi.org/10.37547/tajssei/Volume03Issue01-46

Kay, R. H. (1992). The Computer Literacy Potpourri: A Review of the Literature, or McLuhan Revisited. *Journal of Research on Computing in Education*, *24*(4), 446–456.

Kazu, H. (1996). Öğretmen yetiştirmede mikro öğretim yönteminin etkililiği (Fırat Üniversitesi Teknik Eğitim Fakültesi örneği). *Fırat Üniversitesi Sosyal Bilimler Enstitüsü*.

Kelley, C., & Meyers, J. E. (1995). The cross-cultural adaptability inventory. Minneapolis, MN: National Computer Systems.

Khanna, P. (2020). Techniques and Strategies to Develop Active Listening Skills: The Armour for Effective Communication across Business Organizations. *The Achievers Journal: Journal of English Language, Literature and Culture*, *6*(3), 50-60.

King, M., & Bruner, G. (2000). Social Desirability Bias: A Neglected Aspect of Validity Testing. *Psychology and Marketing, 17,* 79–103. https://doi.org/10.1002/(SICI)1520-6793(200002)17:2<79::AID-MAR2>3.0.CO;2-0

Kirby, J. R., Knapper, C., Lamon, P., & Egnatoff, W. J. (2010). Development of a scale to measure lifelong learning. *International Journal of Lifelong Education, 29*(3), pp. 291-30.

Kitsantas, A., & Meyers, J. (2001). Studying abroad: Does it enhance college student cross-cultural awareness. Paper presented at the annual meeting of the San Diego State University and the US Department of Education Centers for International Business Education and Research.

Knott, M. J., & Kayes, C. (2012). Individual contribution to a team: The importance of continuous adaptive learning. *Organization Management Journal, 9*(1), 22–33.

Koester, J., & Olebe, J. (1988). The behavioral assessment scale for intercultural communication effectiveness. *International Journal of Intercultural Relations, 12*(3), 233–246.

Komarkova, I., Gagliardi, D., Conrads, J., & Collado, A. (2015). *Entrepreneurship Competence: An Overview of Existing Concepts, Policies and Initiatives - Final Report*. https://doi.org/10.2791/067979

Kouchaki, M. and Smith, I.H. (2020) Building and Ethical Career. Harward Business Review, January-February 2020, https://hbr.org/2020/01/building-an-ethical-career

KPMG Advisory Services Pvt Ltd (2017). Human Resource And Skill Requirements in the Pharmaceuticals Sector | Skills Intelligence Platform. (n.d.). Retrieved February 15, 2023, from https://skillsip.nsdcindia.org/knowledge-products/human-resource-and-skill-requirements-pharmaceuticals-sector

Kremer, F., & Estèle, J. (2021). Definition and Testing of a Skills Framework to Evaluate the Effect of a Pedagogical Program in Entrepreneurship. *Journal of Enterprising Culture*, *29*, 21–39. https://doi.org/10.1142/S0218495821500023

Krueger, R. A. (2014). Focus groups: A practical guide for applied research. Sage publications.

Ku, H.-Y., Tseng, H. W., & Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. *Computers in Human Behavior, 29*(3), 922-929.

Kurland, D. M., Pea, R. D., Clement, C., & Mawby, R. (1986). A study of the development of programming ability and thinking skills in high school students. *Journal of Educational Computing Research*, *2*(4), 429-458.

Lapidus, R. S. (2016). Effective communication: A guide for the people professions. Routledge.

Lasater, I., Stiles, J., (2019). *Collaborating in the Workplace: A Guide for Building Better Teams*, PuddleDancer Press

Leung, A. K.-Y., & Chiu, C.-Y. (2008). Interactive Effects of Multicultural Experiences and Openness to Experience on Creative Potential. *Creativity Research Journal, 20*(4).

Lew, M. D. N., & Schmidt, H. G. (2011). Self-reflection and academic performance: is there a relationship? *Advances in Health Sciences Education, 16*(4), pp. 529–545.

Li, H., Xiong, Y., Hunter, C., Guo, X., & Tywoniw, R. (2019). Does peer assessment promote student learning? A meta-analysis. *Assessment & Evaluation in Higher Education*, *45*, 1–19. https://doi.org/10.1080/02602938.2019.1620679

Li, R., Yin, Y., Dai, L., Shen, S., Lin, X., Su, Y., & Chen, E. (2022). PST: Measuring Skill Proficiency in Programming Exercise Process via Programming Skill Tracing. In *Proceedings of the 45th International ACM SIGIR Conference on Research and Development in Information Retrieval* (pp. 2601-2606).

Lin, N. (1999). Building a Network Theory of Social Capital.

Locke, E. A., & Latham, G. P. (2002). Building a practically useful theory of goal setting and task motivation: A 35-year odyssey. *American Psychologist*, *57*, 705–717. https://doi.org/10.1037/0003-066X.57.9.705

Lower L. M., Newman T. J., Anderson-Butcher D. (2017). Validity and reliability of the teamwork scale for youth. *Research on Social Work Practice*, 27(6), 716–725.

Luo, X., Wu, W., Bosilca, G., Patinyasakdikul, T., Wang, L., & Dongarra, J. (2018). ADAPT: An event-based adaptive collective communication framework. Proceedings of the 27th International Symposium on High-Performance Parallel and Distributed Computing, 118–130. https://doi.org/10.1145/3208040.3208054

Lustig, M.W., & Koester, J. (2006). Intercultural competence: Interpersonal communication across cultures (5th ed.). Boston, MA: Pearson.

Lysetty, S., Kannan, S. K., Naha, A., Nayak, U. Y., & Ligade, V. (2022). Design of Skill Enhancement Module for Pharmacy Students—Need of the Hour. *Indian Journal of Pharmaceutical Education and Research*, *56*(3), 618–627.

Maciejewski, G., Simpson, A., Boyle, L., Jimoyiannis, A., McCrory, M., Olstad, H. A., Petersen, S. A., Skimina, E., Topolewska-Siedzik, E., Tsiotakis, P., & Scott, G. G., (2020). *A literature review looking at graduate employability skills (GESs)*: GES App Report 1: Review of the GES literature University of the West of Scotland.

Mannix, E., & Neale, M. A. (2005). What Differences Make a Difference?: The Promise and Reality of Diverse Teams in Organizations. *Psychological Science in the Public Interest*, *6*(2), 31–55.

Mansour, M., Jamama, A., Al-Madani, M., Mattukoyya, R., & Al-Anati, A. (2020). Reconciling assertive communication skills with undergraduate nursing education: Qualitative perspectives from British and Saudi newly-graduated nurses. *Health Professions Education, 6*(2), 176-186.

Marasi, S. (2019). Team-building: Developing Teamwork Skills in College Students Using Experiential Activities in a Classroom Setting. *Organization Management Journal*, *16*(4), 324–337.

Martin, A. J. (2017). Adaptability—what it is and what it is not: Comment on Chandra and Leong (2016). American Psychologist, 72(7), 696–698. https://doi.org/10.1037/amp0000163

Martin, A. J., & Marsh, H. W. (2006). Academic resilience and its psychological and educational correlates: A construct validity approach. Psychology in the Schools, 43(3), 267–281. https://doi.org/10.1002/pits.20149

Martin, A.J. (2012). Adaptability and learning. In N.M. Seel (Ed.). Encyclopedia of the Sciences of Learning New York: Springer

Martin, M. M., & Rubin, R. B. (1995). A New Measure of Cognitive Flexibility. Psychological Reports, 76(2), 623–626. https://doi.org/10.2466/pr0.1995.76.2.623

Mauffette-Leenders, L. A., Kerskine, J. A., Reenders, M. R. (2000). *Learning with cases.* Richard Ivey School of Business.

McCrae, R. R. (1993). Openness to Experience as a Basic Dimension of Personality. *Imagination, Cognition and Personality, 13*(1), pp. 39–55.

McCrae, R. R., & Greenberg, D. M. (2014). Openness to experience. In D. K. Simonton (Ed.), *The Wiley handbook of genius* (pp. 222–243). Wiley Blackwell.

McDaniel, R., & Fanfarelli, J. (2016). Building better digital badges: Pairing completion logic with psychological factors. *Simulation & Gaming*, *47*, 73–102. https://doi.org/10.1177/1046878115627138

McElroy, T., & Dowd, K. (2023). Susceptibility to anchoring effects: How openness-to-experience influences responses to anchoring cues. *Judgement and Decision Making, 2*(1).

McKendall, M. (2000). Teaching groups to become teams. *Journal of Education for Business, 75*(5), 277–282.

McKinsey & Company (2021). Mind the [skills] gap. Available at: https://www.mckinsey.com/featured-insights/sustainable-inclusive-growth/chart-of-the-day/mind-the-skills-gap.

Medina-Lopez-Portillo, A. (2004). Intercultural learning assessment: The link between program duration and the development of intercultural sensitivity. *Frontiers: The Interdisciplinary Journal of Study Abroad, 10*, 179–200.

Meerah, T. S. M., Lian, D. K. C., Osman, K., Zakaria, E. Iksan, Z. H., & Soh, T. M. T. (2011). Measuring Life-long Learning in the Malaysian Institute of Higher Learning Context. *Procedia - Social and Behavioral Sciences, 18*, pp. 560-564.

Meintjes, A. (2015).Creativity and flexibility: essential skills in training learners for a potential entrepreneurial career . Journal of Contemporary Management. Volume 12. ISBN 1815-7440

Mendenhall, M.E., Stahl, G.K., Ehnert, I., Oddou, G., Osland, J.S., & Kuhlmann, T.M. (2004). Evaluation studies of cross-cultural training programs. In D. Landis, J.M. Bennett, & M.J. Bennett (Eds.), Handbook of intercultural training (3rd ed., pp. 129–143). Thousand Oaks, CA: Sage.

Mentz, E., de Beer, J., & Bailey, R. (2019). *Self-Directed Learning for the 21st Century Implications for Higher Education*, AOSIS, Cape Town

Mergler, A. (2007). Personal responsibility: the creation, implementation and evaluation of a school-based program. Doctoral dissertation, Queensland University of Technology

Meyer, E. (2016). *The Culture Map. Decoding How People Think, Lead, And Get Things Done Across Cultures*, Perseus Books, New York

Michael, J., & Yukl, G. (1993). Managerial Level and Subunit Function as Determinants of Networking Behavior in Organizations. *Group & Organization Management, 18*(3), 328–351. https://doi.org/10.1177/1059601193183005.

Misko, J. (2008). Combining Formal, Non-Formal and Informal Learning for Workforce Skill Development. National Centre for Vocational Education Research Ltd. PO Box 8288, Stational Arcade, Adelaide, SA 5000, Australia.

Mitchell, R., & Myles, F. (1998). *Second Language Learning Theories.* Arnold.

Morgan, B. B., Glickman, A., Woodard, E., Blaiwes, A., & Salas, E. (1986). *Measurement of Team Behaviors in a Navy Environment* (Tech Report NTSC TR-86–044). Orlando, FL: Naval Training Systems Center.

Morris, M., Webb, J., Singhal, S., & Fu, J. (2013). A Competency-Based Perspective on Entrepreneurship Education: Conceptual and Empirical Insights. *Journal of Small Business Management*, *51*, 352–369. https://doi.org/10.1111/jsbm.12023

Mourtos, N. J., Okamoto, N. D., & Rhee, J. (2004, February). Defining, teaching, and assessing problem solving skills. In 7th UICEE Annual Conference on Engineering Education (pp. 1-5).

Mullins, C. R. (2017). MBA soft skills: A hard approach for a softer workplace. . *Available at AACSB International website: https://www.aacsb.edu/blog/2017/march/mbasoft-skills-a-hard-approach-for-a-softer-workplace*.

Mumford, M. D., Barrett, J. D., & Hester, K. S. (2012). Background data: Use of experiential knowledge in personnel selection. In The Oxford handbook of personnel assessment and selection (pp. 353–382). *Oxford University Press.* https://doi.org/10.1093/oxfordhb/9780199732579.013.0016

Murphy, T., & Rutherford, W. (2015). The assertiveness workbook: How to express your ideas and stand up for yourself at work and in relationships. New Harbinger Publications.

Nafukho, F. (2008). Consensus building, dialogue and spirituality principles of the learning organization paradigm: implications for Kenya's public service reform agenda. *Journal of Third World Studies, 25(2), 153-175.*

Narodowe Centrum Badań i Rozwoju (2019). *Analiza zapotrzebowania na kompetencje w gospodarce i na rynku pracy wraz z badaniem wartości docelowej wspólnego wskaźnika długoterminowego POWER w obszarze szkolnictwa wyższego.* Warszawa. pp. 40, 42-43. https://ceapp.uj.edu.pl/documents/4628317/143277112/Raport_NCBiR_Kompetencje_26.03.2019.pdf

Noe, R. A. (2017). *Employee training & development* (7th ed.). McGraw-Hill.

Northouse, P. (2018). *Leadership Theory and Practice, Eighth edition*. Sage Publications. https://www.homeworkforyou.com/static_media/uploadedfiles/Peter_G__Northouse_Leadership__T.pdf

Nygren, T. E. (2000, May). Development of a measure of decision making styles. Paper presented at the 72nd annual meeting of the Midwestern Psychological Association, Chicago, IL.

Nygren, T. E. (2000, November). Development of a measure of decision making styles to predict performance in a dynamic J/DM task. Paper presented at the 41st annual meetings of the Psychonomic Society, New Orleans, LA.

Ochoa, X., & Dominguez, F. (2020). Controlled evaluation of a multimodal system to improve oral presentation skills in a real learning setting. *British Journal of Educational Technology*, *51*(5), 1615–1630.

OECD (2009): 21st century skills and competences for new millennium learners in OECD countries. OECD education working papers 41, OECD Publishing, Paris

OECD (2019a), Skills Matter: Additional Results from the Survey of Adult Skills, OECD Skills Studies, OECD Publishing, Paris, https://doi.org/10.1787/1f029d8f-en.

OECD (2019b), OECD Skills Strategy Poland: Assessment and Recommendations, OECD Skills Studies, OECD Publishing, Paris,

OECD. (2016). Innovating Education and Educating for Innovation: The Power of Digital Technologies and Skills. Retrieved from https://www.oecd.org/education/ceri/Innovating-Education-and-Educating-for-Innovation.pdf.

Oh, I.-S., Wang, G., & Mount, M. (2010). Validity of Observer Ratings of the Five-Factor Model of Personality Traits: A Meta-Analysis. *The Journal of Applied Psychology, 96*, 762–773. https://doi.org/10.1037/a0021832

Oliveira, I., Tinoca, L., & Pereira, A. (2011). Online group work patterns: How to promote a successful collaboration. *Computers & Education, 57*(1), 1348-1357.

Olson, C. L., & Kroeger, K. R. (2001). Global competency and intercultural sensitivity. *Journal of Studies in International Education, 5*(2), 116–137.

OpenAI (2023). Using Chat GPT on skills and competence definition.

Oprins, E. A. P. B., van den Bosch, K., & Venrooij, W. (2018). Measuring adaptability demands of jobs and the adaptability of military and civilians, Military Psychology, 30:6, 576-589, DOI: 10.1080/08995605.2018.1521689

Osmani, M., Hindi, N., Al-Esmail, R., & Weerakkody, V. (2017). Examining graduate skills in accounting and finance: The perception of Middle Eastern students. *Industry and Higher Education*, *31*(5), 318–327. https://doi.org/10.1177/0950422217721759

Ozdemir, O., & Tekin, A. (2016). Evaluation of the presentation skills of the pre-service teachers via fuzzy logic. *Computers in Human Behavior*, *61*, 288–299.

Pardaboyevich, R. F., Abdunazirovich, U. S., & Saydullayevich, S. Q. (2020). Teaching Computer Science at School—Current Challenges and Prospects. *JournalNX*, *6*(11), 217–221.

Parker, A. M., Bruine de Bruin, W., & Fischhoff, B. (2007). Maximizers versus satisficers: Decision-making styles, competence, and outcomes. Judgment and Decision Making, 2(6), 342-350.

Parray, W. M., & Kumar, S. (2016). Assertiveness among undergraduate students of the university. *The International Journal of Indian Psychology*, *4*(1), 283-291.

Patakfalvi-Czirják, Á., Papp, Z. A., & Neumann, E. (2018). Az iskola nem sziget. Oktatási és társadalmi reziliencia multietnikus környezetben. Educatio, 27(3), 474–480. https://doi.org/10.1556/2063.27.2018.3.9

Perna, M. C. (2023, April 11). Why Everyone Needs To Embrace Lifelong Learning In Today's Competitive Work Landscape. *Forbes*. Available from: https://www.forbes.com/sites/markcperna/2023/04/11/why-everyone-needs-to-embrace-lifelong-learning-in-todays-competitive-work-landscape/?sh=7de7e4c674b4.

Phillips, A., & Phillips, C. (2016). Behavioral Styles of Path-Goal Theory: An Exercise for Developing Leadership Skills. *Management Teaching Review*, *1*(3). https://journals.sagepub.com/doi/10.1177/2379298116639725

Pipas, M. D., & Jaradat, M. (2010). Assertive communication skills. *Annales Universitatis Apulensis: Series Oeconomica*, *12*(2), 649.

Ployhart, R.E., Bliese, P.D. (2006): Individual ADAPTability (I-ADAPT) theory: conceptualizing the antecedents, consequences, and measurement of individual differences in adaptabilityIn: S. Burke, L. Pierce, E. Salas (Eds.), Understanding adaptability: a prerequisite for effective performance within complex environments, Elsevier Science, US (2006), pp. 3-40

Plummer, D. L. (2018). *Handbook of Diversity Management. Inclusive Strategies for Driving Organizational Excellence*, Half Dozen Publications

Polska Agencja Rozwoju Przedsiębiorczości (2022). *Bilans Kapitału Ludzkiego 2022/2021 Raport z badania pracodawców. Powrót do rzeczywistości? Drugi rok pandemii oczami polskich firm.* Warszawa. p. 50. www.parp.gov.pl/storage/publications/pdf/13-BKL-WCAG_15122022.pdf

Pulakos, E. D., Arad, S., Donovan, M. A., & Plamondon, K. E. (2000). Adaptability in the workplace: development of a taxonomy of adaptive performance. Journal of Applied Psychology, 85(4), 612.

Qolfathiriyus, A., Sujadi, I., & Indriati, D. (2019). Characteristic profile of analytical thinking in mathematics problem solving. Journal of Physics: Conference Series, 1157(3), 032123. https://doi.org/10.1088/1742-6596/1157/3/032123

Rahman, M. (2019). 21st Century Skill "Problem Solving": Defining the Concept. Asian Journal of Interdisciplinary Research, 64–74. https://doi.org/10.34256/ajir1917

Randall, D., Harrison, J., & West, R. (2013). Giving Credit Where Credit Is Due: Designing Open Badges for a Technology Integration Course. *TechTrends*, *57*. https://doi.org/10.1007/s11528-013-0706-5

Rathus, S. A. (1973). A 30-item schedule for assessing assertive behavior. *Behavior Therapy, 4*, 398–406.

Razmerita, L., Kirchner, K., Hockerts, K., & Tan, C.-W. (2020). Modeling collaborative intentions and behavior in Digital Environments: The case of a Massive Open Online Course (MOOC). *Academy of Management Learning & Education, 19*(4), 469-502.

Recommendation of the European Parliament and of the Council of December 18, 2006 on Key Competences for Lifelong Learning (2006/962/EC), L 394/10, Official Journal of the European Union, p. 16, https://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:394:0010:0018:en:PDF

Renzulli, J. S., (2020). The Catch-A-Wave Theory of Adaptability: Core Competencies for Developing Gifted Behaviors in the Second Machine Age of Technology. International Journal for Talent Development and Creativity – 8(1), August, 2020; and 8(2), December, 2020.

Robins, A., Rountree, J., & Rountree, N. (2003). Learning and teaching programming: A review and discussion. *Computer science education*, 13(2), 137-172.

Rogalski, J., & Samurçay, R. (1990). Acquisition of programming knowledge and skills. In *Psychology of programming* (pp. 157-174). Academic Press.

Roseveare, J. (2006). The independence index. A proposed diagnostic for isolated functioning ability grounded in a study of current human needs in an increasingly solitary society [Pro_doc, University of East London]. https://repository.uel.ac.uk/item/86718

Rost, J. C. (1991). *Leadership for the twenty-first century*. Praeger, Greenwood Publishing Group.

Ruge, G., & Mccormack, C. (2017). Building and construction students' skills development for employability – reframing assessment for learning in discipline-specific contexts. *Architectural Engineering and Design Management*, *13*, 1–19. https://doi.org/10.1080/17452007.2017.1328351

Rutter, M. (2013): Annual research review: Resilience-clinical implications. Journal of Child Psychology and Psychiatry, 54 (4), pp. 474-487

Sadler, D. (1989). Formative assessment and the design of instructional systems. *Instructional Science, 18*(2), 119-144.

Sapienza, J., Masten, A. (2011): Understanding and promoting resilience in children and youth. Current Opinion in Psychiatry, 24 (4) (2011), pp. 267-273

Saunders, E. G. (2020). 4 tips for effective virtual collaboration. Avaiable at: *https://hbr.org/2020/10/4-tips-for-effective-virtual-collaboration*.

Scherer, R. & Gustafsson, J.-E. (2015). The relations among openness, perseverance, and performance in creative problem solving: A substantive-methodological approach. *Thinking Skills and Creativity, 18*, pp. 4-17.

Schneider, W. J., & Newman, D. A. (2015). Intelligence is multidimensional: Theoretical review and implications of specific cognitive abilities. Human Resource Management Review, 25(1), 12-27.

Senge, P. (1990). *The Fifth Discipline: The Art and Practice of the Learning Organization*. Currency/Doubleday, New York, NY.

Setyawati, Y., Afandi, A. & Titin, T. (2021). Mourtos's Problem Solving Skills: A View Based on Gender. International Journal of Science and Applied Science: Conference Series. 4. 10.20961/ijsascs.v4i1.49461.

Shonfeld, M., Cotnam-Kappel, M., Judge, M., Ng, C. Y., Ntebutse, J. G., Williamson-Leadley, S., & Yildiz, M. N. (2021). Learning in digital environments: a model for cross-cultural alignment. *Educational Technology Research and Development, 69*(4), 2151-2170.

Silliman, B. (2004). Key Issues in the Practice of Youth Development. Family Relations, 53(1),12–16. https://doi.org/10.1111/j.1741-3729.2004.00003.x

Silva, F., Guevara, J. & López Regalado, O. (2021). Creative thinking in the educational context. Revista Científica de la UCSA. 8. 39-50. 10.18004/ucsa/2409-8752/2021.008.03.039.

Siskel. K., & Flexman, R. (1962). *Study of the effectiveness of a flight simulator for training complex aircrew skills*. Bell Aeronautics.

Skinner, E. A., & Pitzer, J. R. (2012). Developmental Dynamics of Student Engagement, Coping,and Everyday Resilience. In S. L. Christenson, A. L. Reschly, & C. Wylie (Ed.), Handbook of Research on Student Engagement (pp. 21–44.). https://doi.org/10.1007/978-1-4614-2018-7_2

Skinner, E., Pitzer, J., & Steele, J. (2013). Coping as Part of Motivational Resilience in School: A Multidimensional Measure of Families, Allocations, and Profiles of Academic Coping. Educational and Psychological Measurement, 73(5), 803–835. https://doi.org/10.1177/0013164413485241

Slack (2023). Slack: A unified communication platform to improve team collaboration. *Available at: https://slack.com*

Soloway, E., & Spohrer, J. C. (Eds.). (1989). *Studying the novice programmer*. Hillsdale, NJ:Lawrence Erlbaum.

SORS (2023). Izobraževanje in usposabljanje zaposlenih v podjetjih, 2020. SURS. Pridobljeno s https://www.stat.si/StatWeb/News/Index/10391

Soto, C. J., Napolitano, C. M., Sewell, M. N., Yoon, H. J., & Roberts, B. W. (2022). An integrative framework for conceptualizing and assessing social, emotional, and behavioral skills: The BESSI. *Journal of Personality and Social Psychology*, *123*(1), 192–222. https://doi.org/10.1037/pspp0000401

Spiro, R. J., Collins, B.P., Ramchandran, A.R.(2007): Modes of openness and flexibility in cognitive flexibility hypertext learning environments. In: B. Khan (Ed.), Flexible learning in an information society, Information Science Publishing, Hershey, PA, pp. 18-25.

Starke-Meyerring, D. (2007, October). *Designing globally networked learning environments: Visionary pedagogies, partnerships, and policies.* Keynote speech at the 1st Conference.

Starke-Meyerring, D. (2010). Globally networked learning environments in professional communication: Challenging normalized ways of learning, teaching, and knowing. *Journal of Business and Technical Communication, 24, 259-266.*

Statistics Poland (2021), *Human capital in Poland in the years 2016–2020*, pp. 32-33. https://stat.gov.pl/files/gfx/portalinformacyjny/pl/defaultaktualnosci/5501/8/8/1/kapital_ludzki_w_polsce_w_latach_2016_2020.pd

Sternberg, R. J. (2012). A model for ethical reasoning. Review of General Psychology, 16, 319-326.

Straffon, D. A. (2003). Assessing the intercultural sensitivity of high school students attending an international school. *International Journal of Intercultural Relations, 27*(4), 487–501.

Swartz, S., Barbosa, B., & Crawford, I. (2019). Building Intercultural Competence Through Virtual Team Collaboration Across Global Classrooms. *Business Communication Quarterly*, *83*, 1–23.

Thorpe, K. (2004). Reflective learning journals: From concept to practice. *Reflective Practice, 5*(3), pp. 327–343.

Tommaso, F., Sella, E., Meneghetti, C., & Cona, G., (2023). Adapt, Explore, or Keep Going? The Role of Adaptability, Curiosity, and Perseverance in a Network of Study-Related Factors and Scholastic Success. Journal of Intelligence 11: 34. https://doi.org/ 10.3390/jintelligence11020034

Tsai, M.-J., Wang, C.-Y., & Hsu, P.-F. (2018). Developing the Computer Programming Self-Efficacy Scale for Computer Literacy Education. *Journal of Educational Computing*, *56*(8), 1–16.

Tudor, K. E., & Spray, C. M. (2017). Approaches to measuring academic resilience: A systematic review. International Journal of Research Studies in Education, 7(4). https://doi.org/10.5861/ijrse.2017.1880

van Loon, M. H. (2018). Self-Assessment and Self-Reflection to Measure and Improve Self-Regulated Learning in the Workplace. *Handbook of Vocational Education and Training,* pp 1–20.

vanSand, C. V. and Neck, C. P. (2003): Bridging Ethics and Self Leadership: Overcoming Ethical Discrepancies Between Employee and Organizational Standards in Journal of Business Ethics, 43, 363-387

Vasquez, R. A. (2022) The Ethical Decision-making Gap in Student Ethics: Examining How University Students Approach Ethical Dilemmas. International Journal of Ethics Education Vol 7, pp 53–71.

Veletsianos, G., & Kleanthous, I. (2009). A review of adven- ture learning. *International Review of Research in Open and Distance Learning, 10*(6), 84–105.

Volet, S. E., & Ang, G. (1998). Culturally mixed groups on international campuses: An opportunity for inter-cultural learning. *Higher Education Research & Development, 17*(1), 5–23.

Von Davier, A. A., Zhu, M., Kyllonen, P. C. (2017). *Innovative Assessment of Collaboration (Methodology of Educational Measurement and Assessment)*, Springer, Cham

Wihlenda, M., Brahm, T., & Habisch, A. (2023). Responsible management education: Social entrepreneurial competences of civically-engaged students. The International Journal of Management Education, 21(1), 100756. https://doi.org/10.1016/j.ijme.2022.100756

Williams, T.R. (2005). Exploring the impact of study abroad on students' intercultural communication skills: Adaptability and sensitivity. *Journal of Studies in International Education, 9*(4), 356–371.

Winne, P. (2004). Students' calibration of knowledge and learning processes: Implications for designing powerful software learning environments. *International Journal of Educational Research, 41*(6), 466-488.

Winslow, L. E. (1996). Programming pedagogy—a psychological overview. *ACM Sigcse Bulletin*, *28*(3), 17-22.

Wolff, H.-G., & Moser, K. (2009). Effects of networking on career success: A longitudinal study. *The Journal of Applied Psychology, 94*(1), 196–206. https://doi.org/10.1037/a0013350

Wolff, H.-G., & Moser, K. (2010). Do specific types of networking predict specific mobility outcomes? A two-year prospective study. *Journal of Vocational Behavior - J VOCAT BEHAV, 77*, 238–245. https://doi.org/10.1016/j.jvb.2010.03.001

Wrench, J. S., Goding, A., Johnson, D. I., & Attias, B. A. (2012). *Public speaking: Practice and ethics*. http://2012books.lardbucket.org/books/publicspeaking-practice-and-ethics/

Yale University (n.d.) Learn and Grow: What is adaptability in the workplace? Retrieved on 31.05. 2023. from https://your.yale.edu/learn-and-grow-what-adaptability-workplace

Yeager, K. L., & Nafukho, F. M. (2012). Developing diverse teams to improve performance in the organizational setting. *European Journal of Training and Development*, *36*(4), 388–408.

Zhu, Y., Gareis, E., Bazzoni, J. O., & Rolland, D. (2005). A collaborative online project between New Zealand and New York. *Business Communication Quarterly, 68,* 81-96.