Skills for change makers

Inspiration and recommendations for the further development of skills learning trajectories at Wageningen University & Research

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Preface

In 2019 Wageningen University & Research (WUR) set the ambition to make skills learning trajectories an explicitly integrated component of all bachelor's degree programmes by 2025. To achieve this goal, the BSc Skills Learning Trajectories project was launched. The aim of this project was to create and strengthen continuous skills learning trajectories in the curricula of all bachelor's programmes at WUR and ensure their visible presence in education.

Over the past four years, bachelor's programmes have worked on designing, implementing and carrying out these skills learning trajectories within their courses, supported by a project team. This support was shaped in close collaboration with programme directors, teachers, and support staff. The project team's work encompassed a wide range of activities. These included fostering collaboration and inspiration, organising events, sharing knowledge, and promoting best practices. Activities also focused on streamlining processes, creating useful tools, guiding experiments, contributing to projects, and providing hands-on support to programme teams.

These activities have led to valuable insights about shaping skills education and implementing skills learning trajectories. In this document we want to share these insights, our lessons learned and the recommendations we have derived from our experiences. Besides these recommendations, this document provides concrete results of programmes, that serve as inspiring and useful examples for others.

As the project leader (2020-2024), I want to encourage Wageningen University to build upon the progress that has been made and to continue prioritising skills education as a crucial component of academic programmes. I believe that providing effective skills education is essential to prepare students in becoming responsible change makers who will contribute meaningfully to science and society.

I would like to thank everyone who has contributed to the success of this project: your collaborative spirit, expertise and dedication have been essential in achieving our goals and laying the foundation for the future of skills education at WUR.

Renske Dijkstra
Project Leader, BSc Skills Learning Trajectories

Wageningen, December 2024

Introduction

The BSc Skills Learning Trajectories project was born to fulfil an important ambition in the Wageningen University & Research's Vision for Education 2017.[1] To guide and shape the ambition, WUR defined sixteen generic skills, with input from various stakeholders. The transfer from an appealing vision to a realistic practice is a common challenge in higher education. To ensure that skills learning trajectories would be integrated into the bachelor degree programmes, WUR initiated a substantial four-year project in 2020. This project had the aim to transfer policy to practice, by creating supportive guidelines that really serve educational professionals, enhancing collaborative development and shared learning and offering and unlocking support, expertise and existing practices. These efforts contributed to visibility, presence, and integration of these generic skills across all bachelor's programmes.

1.1 Educational mission

In higher education, there is an increasing focus on the development of generic skills, including cognitive abilities like critical thinking, interpersonal skills such as collaboration, and metacognitive skills like self-regulation.[2] This shift reflects broader societal changes, such as rapid technological advancements, the necessity for global collaboration on complex challenges, and the urgent need for sustainable food production.

Wageningen University is acutely aware of these trends and is dedicated to addressing them through its educational mission. Since the 2017 Vision for Education, the importance of skills development has been a priority, emphasising a multidisciplinary, international, and multicultural approach. Now, after four years of focused project work, skills are as relevant as ever.

The new Vision for Education (2025)[3] reinforces the aim to educate *responsible change makers for science and society*. Wageningen University aims its students to become academic professionals who contribute to sustainable solutions for current and future complex issues within the domain of 'healthy food and living environment' across the globe. These professionals are expected to take their social, personal, and ethical responsibilities seriously. The complexity and uncertainty inherent in today's world requires academics who are not only knowledgeable but also motivated to make a positive impact.

The concept of being a responsible change maker for science and society encompasses three key aspects:

Responsible refers to shared values and the ethical viewpoints that guide our education, such as sustainability, courage and collaboration. This idea also grounded in personal leadership: consciously choosing position and defining for oneself the boundaries of one's own 'responsibility'. It also means change makers accept the consequences of their actions: their chosen position determines which role they take on in science and society, they are 'response-able'. Moreover, for those who are academically trained 'responsible' also means critically evaluating evidence and adhering to codes of research integrity.

Change maker implies that students and professionals can and should strive to add meaningful value to their field of interest. 'Change' relates to making a difference and contributing to solutions for the challenges we face. In some instances, this might mean focusing on one small part of a wicked problem or advancing fundamental research; other cases may require systems thinking and holistic approaches, perhaps even radical ones. It is our task to support learners in discovering for themselves how they can best contribute, be it through academia or in the professional world.

For science and society. As experts in their fields Responsible Change Makers take on diverse roles. They can be scientists who push the boundaries of knowledge, engineers who design and implement solutions, entrepreneurs who scale up inventions and make them accessible to a wider audience, and advisers who interact on the science-policy interface.

By integrating generic skills in all BSc study-programmes Wageningen University equips students to become responsible change makers who can effectively address the complex challenges faced by society today and in the future.

1.2 Project objective

The objective of the bachelor skills project was to ensure that, by 2025, skills learning trajectories are a common characteristic of WUR education and visibly present for a set of defined skills, in all bachelor's degree programmes.

Skills are best developed when they are reinforced multiple times throughout a study programme and when students are encouraged to reflect on their skills and relate their current performance to previous experiences and performances to come. This requires academic programmes to adjust their curricula to optimise skill development. Courses and assessments addressing the same skills should be aligned with common learning goals and build upon one another. When the content and learning activities of courses are aligned and contribute towards a coherent set of learning goals, they form a learning trajectory. Well-designed learning trajectories ensure that individual courses contribute effectively to the overall goals of the programme. For programme management, teachers, and students, this continuity is crucial for the organisation, design, and effectiveness of education. Well-designed learning trajectories enhance the quality and effectiveness of skills education at WUR.

To achieve the objective, the project focused on enhancing both the visibility and presence of skills education across all programmes. While a university-wide set of generic skills was defined, individual programmes could emphasise those skills most relevant to their field or even add their own programme-specific skills. Each programme was given the flexibility to focus on specific skills that aligned with their unique disciplinary needs and future career prospects of their students. This allowed each programme to maintain its individuality while contributing to the broader educational mission.

1.3 Approach

To ensure progress, monitoring and sound decision making, a governance structure was set up. This structure clearly describes all the roles and responsibilities involved, as well as the decision-making process. For a detailed description see Appendix I.

The BSc Skills Learning Trajectories project employed a systematic and collaborative approach to achieve its objectives. The pace, strategy, and outcomes were tailored to meet the specific needs of each programme. In this way, programmes were able to add their own emphasis and retain their individuality. The chosen strategy was a participatory implementation process. Stakeholders collaborated to make sure the results were beneficial for all. These stakeholders include programmes, students, and educators. The project team had a service-oriented approach, with the intention to address as many support questions as possible, with the idea that a solution created on a small scale could always be beneficial for more programmes. To serve this purpose, the focus was on realistic and scalable solutions. Programmes differ in their pace, ambition and preferred strategy. To do justice to all differences, including also the unique characteristics of each programme, the project team applied an open, exploratory, and development-oriented approach.

The project provided support for the actual integration of these skills within the curricula. Programmes were encouraged to share practices, teaching methods, learning materials and tools for feedback and assessment with one another. This exchange of knowledge helped programmes refine their approach to skill development and ensured a coherent and effective implementation.

During the project there was a focus on making skills visible. A key aim was to ensure that students clearly understood which skills are being addressed in each course and when they had opportunities to practice these skills. This insight enhances conscious learning and is a precondition for students to take responsibility in learning and steer their learning process. Tools such as skill icons, skills academies and skills overviews per programme were developed and incorporated into course materials, making the skills more visible and easily identifiable for students throughout their education.

1.4 Key activities

The project team focused its efforts on supporting, facilitating, and enhancing the implementation of skills learning trajectories within the programmes. This was achieved through the following key activities:

Streamlining processes
A phased step-by-step approach made the development clear and feasible for both programmes and support staff. For example, programmes were supported by mapping their current and desired situation, by identifying where and how skills were already integrated and making the skills learning trajectories visible.

Facilitating inspiration sessions
Regularly workshops took place, where good practices were shared by people within WUR as well as by guests from other universities.

Stimulating community building and co-creation
Colleagues with shared interests, expertise, and experiences were brought together to collaborate on specific skills, clusters of skills, or skill-related topics. For some areas, dedicated working groups were established to develop supported solutions to shared challenges. Interactive workshops and sessions played a key role in facilitating the exchange of best practices.

Supporting pilots and innovation projects
Support was provided for several initiatives related to the development of skills education. For example, the Portflow pilot was initiated to enable students to monitor their skill development. The project team was involved in WUR's innovation projects that contributed to skills education as well as Comenius projects.

Making practice and knowledge accessible
Through meetings, a Teams environment and Intranet, the output of community activities - as well as existing practices and the results of innovation projects and pilots - were identified and made available. Learning materials for skills were shared in the Library for Learning. A Skills Brightspace Learning Environment was created to show learning activities in context. This environment supports skills coordinators in creating or refining a skills academy for their programme.

Providing hands-on support to programme teams
This support consisted of informing programme teams about frameworks, good practices, available tools and learning materials, co-creating solutions such as a skills Brightspace, facilitating teacher meetings and advising teachers on how to address skills in their courses.

Creating tools and templates
The project team developed various tools and templates to support the implementation of skills learning trajectories. These resources played a crucial role in guiding programmes through the process, documenting outcomes, and making skills more visible. By providing a shared framework and language, these tools facilitated consistency and collaboration across the university, ensuring a streamlined and effective approach to integrating skills education.

Examples of tools and templates[4]

The **fingerprint** is a mapping exercise designed to help programmes establish clear development goals. During the first year of the project, the starting point for each programme was mapped by analysing the presence of sixteen skills across all courses. This analysis was conducted using course guides in Osiris and later validated by the programmes themselves. The results were summarised in a clear and visually concise analysis, providing valuable insights into the overall state of bachelor-level skills at WUR.

The **skills profile** is designed to help programmes define their own approach to the intensity and focus of skills integration within their curriculum. It distinguishes between core skills, supportive skills, and implicitly taught skills, while also indicating the final attainment level for each skill. Core skills are explicitly taught, assessed, and clearly recognised by students, forming an integral part of a programme's learning outcomes. Certain skills, such as boundary crossing, personal leadership, and social embeddedness, act as frameworks for developing other skills. For instance, some programmes have chosen to place personal leadership and reflection at the heart of their skills education.

In the **BSc skills learning outcomes document**, learning outcomes for all skills are defined at three attainment levels, supported by rubrics.[5] This document is the product of an extensive review process involving numerous university stakeholders. It provides a foundation for defining the learning outcomes of skills trajectories within programmes.

The **skills profile rubric generator** is a tool to generate a tailormade rubric. Each programme can use an Excel file to tailor the skills learning outcomes to their unique skills profile. Attainment levels and subskills can be selected and adapted.

The **skills trajectory blueprint** is a tool used to (re)design a learning trajectory per skill. It is used during teacher meetings to document how courses contribute to the learning trajectory and to formalise agreements among the teachers involved.

To support programmes in getting started, a **guideline** for the design and implementation of skills learning trajectories was developed.[6] This guideline provides a roadmap featuring a step-by-step approach to guide programmes through the process. It includes practical tools, templates, and conversation aids tailored for use by programme committees, teachers, and skills development teams, ensuring structured and effective implementation.

1.5 Skills clusters

WUR has identified four clusters, comprising sixteen fundamental skills. These skills play a crucial role in helping students to develop their personal and professional identities, enabling them to thrive in both academic and professional environments. Although all programmes aim to foster these skills, the emphasis on each skill varies depending on the specific nature and goals of the programme. Some of the programmes have, in addition to the set of sixteen fundamental skills, added programme-specific skills that are specifically applicable to the nature and context of the programme.

Communication

Communicating ideas, problems, and solutions (verbally and in writing), aimed at an audience of both specialists and non-specialists in the field of [...], in a clear and structured manner, with a concise line of reasoning and effective arguments, both in Dutch and in Academic English.

Academic English: Understand lectures, debates and texts and use a sufficient range of English language to give clear descriptions, express viewpoints and develop arguments, using a good range of academic vocabulary for matters connected to their field.

Argumentation and reasoning: Construct a logical and persuasive argument, use evidence, clear reasoning and critical thinking to communicate and persuade the audience effectively, while considering different points of view and anticipating potential objections and counterarguments.

Presenting: Deliver a clear and structured presentation, in connection with the audience and supported by suitable (visual) tools and non-verbal communication to get the content and message across.

Writing: Write a clear and structured text, appropriate for the specific goal and target, supported by relevant sources and supporting elements (tables, figures and appendices).

Personal development

Reflecting upon personal knowledge, skills, attitudes, and (entrepreneurial) functioning, both individually and in a (multidisciplinary) team. Planning your own learning path, asking and giving constructive feedback, and using the valuable feedback for product and skill improvement in the field of [...].

Collaboration: Collaborate effectively in a (multidisciplinary) team to perform project-based work, by structuring meetings, executing different team roles and tasks and being open to multiple perspectives.

Feedback: Proactively seek feedback and use the valuable feedback to enhance learning and results.

Entrepreneurial skills: Apply and integrate concepts and theories to select, test and refine ideas that create value for others and to develop, design, test and/or implement new solutions (knowledge, product or process).

Reflection: Identify, analyse and evaluate own experiences, actions, thoughts, feelings and outcomes to gain insights, to enhance learning and to develop alternative behaviour.

Personal leadership: Take responsibility for one's own actions, decisions, and outcomes. Set goals, make plans, and take action to achieve those goals. Be accountable for one's own learning and development and take steps to continuously improve skills and knowledge.

Research

Analysing an issue in the field of […] by defining a research problem, planning research, searching and reviewing literature, mining, collecting, processing and interpreting data, and putting the results in a wider context in order to develop new knowledge, a new product or a new process.

Researching: Identify a potential research problem and develop and execute a research plan in which a problem definition, research questions, hypothesis, set-up and data analysis are described in relation to relevant literature.

Information literacy: Search, find, evaluate, select, manage, and communicate scientific information.

Data: Apply appropriate methods and techniques to mine, collect, process, analyse, interpret and visualise relevant data, putting the results and its presentation in a wider context.

Responsibility

Understanding and investigating complexities and implications of scientific knowledge and societal issues in the field of [...]. Being aware of, defining, and discussing your own position and the position and background of stakeholders to utilise diversity and develop solutions to positively impact society.

Diversity and inclusivity: Explain differences in behaviour and communication as related to cultures and values, interact with others, suspend judgment, being aware of one’s position and utilise diversity in a study context.

Practical ethics and dilemmas: Identify, assess, explain and judge ethical and societal issues and implications that may arise, and define and discuss one’s position and values with well-argued choices.

Philosophy of science: Judge research publications by critically reflecting on problems, theories and concepts, research design, approaches, methodologies and results and recognise the limits of scientific knowledge.

Social embeddedness and impact: Understand and investigate place, function, concerns and complexities of one’s study domain within society, and the position and interaction of stakeholders to develop solutions for positive impact.

Recommendations

The project activities have led to valuable lessons learned and insights about shaping skills education and implementing skills learning trajectories in programmes. The recommendations in this chapter were collected through experiences, observations and conversations with coordinators, programme directors, students and teachers. Several meetings added to these insights, such as sharing sessions for programmes that were working on similar activities. Also, the reports and evaluations that programmes shared about their project provided valuable information. To retrieve recommendations from student's perspective "Education Experience" sessions were organised. A working group of experts developed recommendations specifically for the four responsibility skills, reflection and personal leadership. At the end of the project harvesting sessions were organised to check, refine and illustrate the recommendations and lessons learned. These sessions provided illustrative concrete examples of the realisation of skills learning trajectories in WUR BSc programmes, to inspire future development.

The most important and broadly recognised recommendations and lessons learned can be summarised in nine clusters:

1. The role of skills coordinator is key
2. Just start (small)!
3. Integrate skills learning trajectories
4. Make skills learning trajectories visible for students and staff
5. Personal leadership and reflection shape learning trajectories
6. Make use of authentic experiential education
7. Focus on formative assessment
8. Use edtech-tools for skills development
9. Give attention to teacher competencies

2.1 The role of skills coordinator is key

Formalise the role of skills coordinator
An effective integration of skills into the curriculum requires a skills coordinator for each programme. The role of the skills coordinator is essential to ensure the continuity, coherence, and quality of skills learning trajectories within the programme. A skills coordinator serves as the key link between course coordinators/ teachers, skills experts, the programme director, and student assistants. The skills coordinator is in charge of (1) the strategic embedding of skills in the curriculum; (2) organising collaboration and alignment amongst teachers, and with skills experts if applicable; (3) educational activities such as organising/coordinating sessions with students and developing and maintaining materials and resources; and (5) evaluation and quality assurance.

Many current skills coordinators indicate that their role was 'informal' up to 2024. A formalised role would have greatly supported them in coordinating and improving the learning trajectories, and in collaborating and sharing experiences and knowledge among different programmes. By officially establishing the role of skills coordinator, programmes and educators can sustainably benefit from a clear structure and support, ultimately enhancing the quality and effectiveness of education. This role is described in Appendix II: Advice for the structure and implementation of the role: coordinator skills learning trajectories. This advice is based on the experiences of the current "informal" skills coordinators. It is part of the proposal for allocation of the Quality Agreement budget for the subcategory Small-scale education.

Engage the programme committee
An important advice for skills coordinators is to actively engage the programme committee in an early stage, and make sure to have a mandate. This was mostly done by sharing the Fingerprint analysis with the programme committee and have some of the members involved in this analysis. Also, the process of defining a programme's Skills profile proved to be an important step to engage the programme committee.

Organise a staff meeting for the programme
In most cases a staff meeting was planned after the first inventory steps and ideation. This meeting had the purpose to involve and engage teachers. Several tools, such as the Skills trajectory blueprint, can be used to streamline the meeting and record the results. In retrospect, these meetings were valued as an important defining step.

Form a group of dedicated teachers
In the preparation of a staff meeting, or shortly after this meeting, forming a group of dedicated teachers is required to ensure sufficient backing and capacity for the next steps. Most of the times these teachers were involved in skills-oriented courses, had affinity for skills education, and supported the need for change.

2.2 Just start (small)!

Apply an action-oriented approach
All programmes that have made significant progress during the project had three things in common: (1) After defining a clear goal or need for change, they took the leap, started with a first step in the right direction without a fully elaborated definition of their intended results, and often in the absence of the perfect conditions. They worked agile, adjusting their interventions to what they encountered, and allowing space for progressive insight; (2) They had extra funding at some stage (Comenius or WUR education innovation project). The funding was mostly granted after some significant development was already achieved; (3) They did not do it alone, but they formed a small group of dedicated people and engaged skills experts and advisors

When asked what to advice a future colleague in a similar role, skills coordinators mentioned encouraging phrases like: "Don't try to get everything perfect", "Don't be afraid to make the jump, even if you don't know everything", "Don't wait for the right conditions" and "Don't get stuck in theory, reflections or limitations, but go do something". They agree that an action-oriented approach with an open character works better for this kind of projects than a fully developed and detailed plan. They view uncertainties and unexpected turns as inherent to this kind of development. Education is a dynamic and complex field. Trying to cover all your bases risks loss of motivation, energy and commitment.

Apply a step-by-step approach
A systematic approach helps make the process clear, focused, and efficient by ensuring that steps logically build on one another and allowing for the identification of smaller, manageable sub-steps. The guideline provides a step-by-step approach with conversation tools and templates for each of the steps. Some programmes opted to follow this guideline closely, while others adapted the tools and steps to fit their specific needs.

Within the *Bachelor Food Technology* programme, a clear roadmap was created to guide the start of the process, based on the team's experiences with the implementation of skills learning trajectories (see figure 1).

Define clear goals and definitions
For most programmes, the first step was to analyse the Fingerprint and create a Skills Profile. This foundational step is also the key recommendation for other programmes starting this process. The analysis helps identify priorities, enabling informed decisions about what to develop and who to involve. An essential part of this process for skills coordinators is to engage in discussions within their programme committee and teachers involved) to define the meaning and relevance of specific skills in the context of their curriculum. This ensures alignment with the programme's goals and provides a clear direction for integrating skills education.

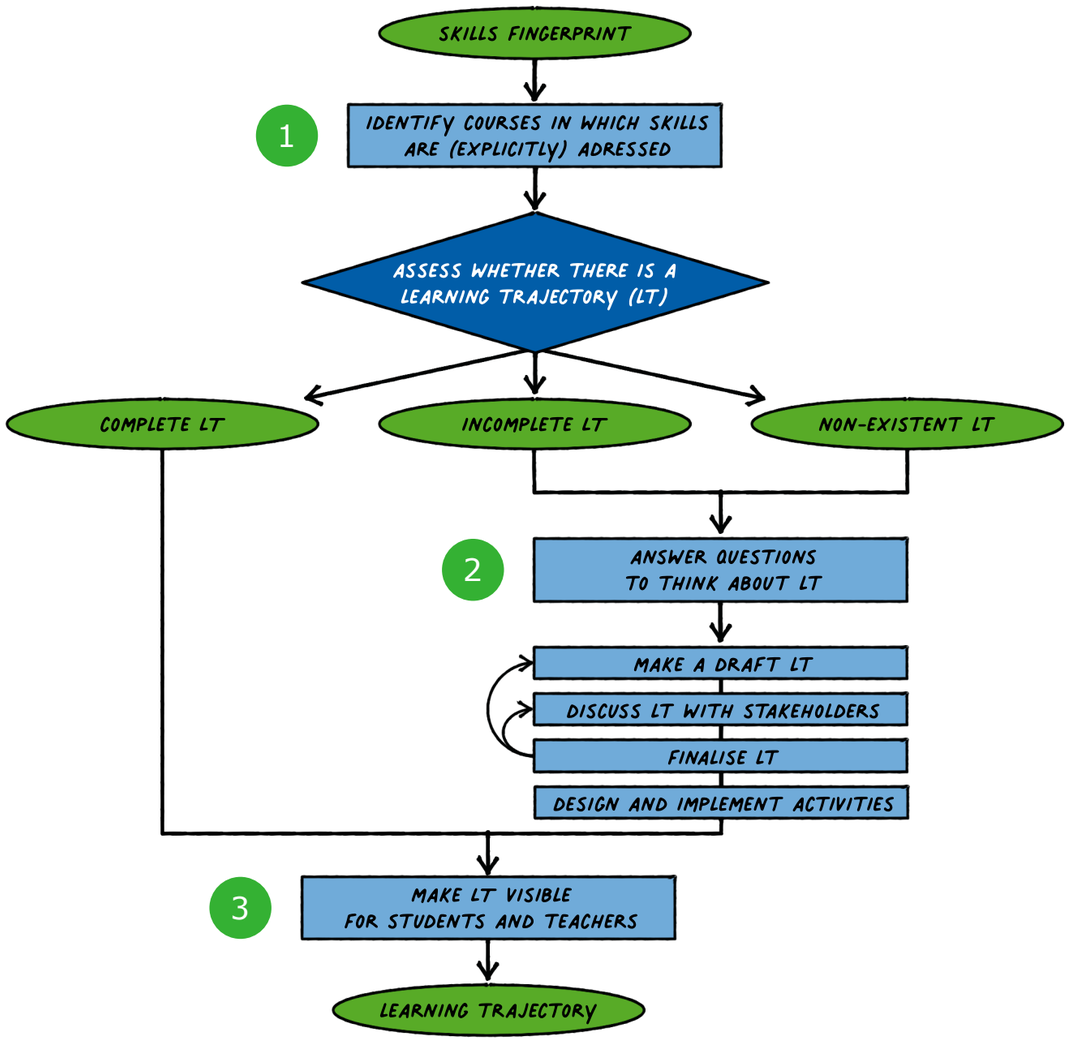


Figure 1. Implementation roadmap of the the *Bachelor Food Technology* programme.

Limit the scope
Start with a manageable scope: focus on a small number of skills and a limited selection of courses. This approach creates the space to evaluate, adapt, and learn from the process as you progress. By starting small and iterating based on insights gained, you can build a solid foundation for expanding skills education across the programme.

Examples
The *Bachelor Environmental Sciences* piloted their skills academy with a small group of seven volunteering students. This approach kept the pilot feasible. The small group made it possible to involve the students in the development, securing their perspective. (See page 30)

The *Bachelor Nature and Forest Conservation* piloted the implementation of one skill: Information Literacy. Focusing on one skill made it possible to do a thorough implementation pilot. (See page 28)

2.3 Integrate skills learning trajectories

Introduce longitudinal courses
By embedding skills learning trajectories throughout the curriculum, programmes create a unified, impactful academic journey that prepares students for professional and personal growth. Learning trajectories that extend over several periods - or even years - can provide significant value, e.g. for a professional development trajectory. Many programmes recognise the advantages of a longitudinal course in fostering continuity and depths in skills education, and have successfully implemented some form of longitudinal trajectory, A Terms of Reference (ToR) is currently (December 2024) being developed for a plan that will make longitudinal courses available to all WUR programmes. Skills education may greatly benefit from this.

Align skills development with all curriculum developments
When redesigning a curriculum, skills development should be integrated from the beginning, rather than being treated as a separate element. Skills learning trajectories are an integral part of the study programme, and influence content oriented learning outcomes, and vice versa.

It is also important to align with other ongoing curriculum developments. Often, goals can be combined, and working integrally is both more efficient and effective than creating separate processes for different curriculum development objectives. For example, the Boundary Crossing project[7], which incorporates many skills from the BSc skills set, demonstrates the value of integration. Implementing learning trajectories for both boundary crossing and other skills in parallel ensures a cohesive and interconnected learning experience for students.

Example
In the *Bachelor Marine Sciences* skills learning trajectories were developed in parallel with the design of the curriculum. An important thread through the curriculum is the boundary crossing and personal leadership trajectory. This practice illustrates how these skills are integrated in cohesion both with other skills, such as collaboration. (See page 35)

Align skill development with domain-specific course content
Integrating skills into domain-specific courses ensures that students can develop and apply their skills in relevant, meaningful contexts. This approach reinforces the connection between skills and domain-specific knowledge. Aligning skill development with course content helps maintain coherence across the curriculum. To achieve this, programmes should identify the courses most suitable for embedding skills, considering both content and timing.

Example
The pilot of the implementation of Information Literacy in the *Bachelor Forest and Nature Conservation* showed that for effective learning and motivation of students, it was crucial to integrate the acquisition of the skill in the content of the courses. (See page 28)

2.4 Make skills learning trajectories visible for students and staff

Be clear about where and how skills are addressed
A visible and comprehensive overview of how and when skills are addressed in courses creates transparency for students. This transparency is an important condition for conscious and deliberate learning and ownership. Some of the programmes have created a clear roadmap to inform students about the learning trajectories at the beginning of the programme. This transparency was created to be beneficial for students, but it is often mentioned that this was also a valuable and important step to involve and inform staff, to document agreements and to ensure compliance.

Example

The bachelor programmes of *Animal Sciences*, *Food Technology*, *Plant Sciences* and *Forest and Nature Conservation* created visual overviews for students that show skills learning trajectories throughout the programme. (See figure 2)

Make use of the skills icons

Skills icons have been developed for WUR to increase visibility and facilitate the recognisability of learning trajectories throughout courses. These icons are available for the generic set of sixteen BSc skills, but also for programme specific skills such as Boundary Crossing, Systems Thinking and Lab Skills.[8] The icons are used by several programmes, for example by adding them to courses in Brightspace, learning activities and PowerPoint presentations.

Example

An example of the use of the icons is the visual that is used by the *Bachelor Environmental Sciences* skills academy, inspired by a similar visual for the Food Technology Skills Academy. (See page 30)

Connect skills to the professional field

Informing students about skills, their relevance, and practical applications is key to support students in understanding the importance of skills within their programme. Information about the need for skills in the professional field helps students connect the skills to their academic and professional development, making learning more intentional and meaningful. For this purpose, programmes make use of online Brightspace courses, that provide information to students about skills. These resources include explanations of skill importance in professions and success stories that illustrate their practical applications.

Examples

In the *Bachelor Plant Sciences* students orient themselves towards skills acquisition through identification with authentic professional profiles. In this way students connect their learning journey to their future career. (See page 36)

In the *Bachelor Biotechnology* students use a visualised skill rubric to gain insight in their progress in skills acquisition throughout the programme. (See page 29)

In the *Bachelor International Land and Water Management* students interview graduates. This is one of the assignments of a course that helps first-year students think about their interests and future career, encouraging them to actively participate in the study programme and demonstrate personal leadership. (See page 34)

2.5 Personal leadership and reflection shape learning trajectories

Implement a personal development track

Programmes recognised the ambition of the project and acknowledged the importance of coherent and visible skills learning trajectories. Often they expressed related ambitions that combined very well with strengthening these skills learning trajectories. Ambitions that were often mentioned are (1) cohort-building, to strengthen academic engagement and a sense of belonging, (2) career orientation, to help students find direction, strengthen motivation and make choices, (3) enhancing ownership, to help students direct their learning, and (4) emphasising identity or vision of the programme, to strengthen and make visible the unique character of a programme and its meaning and value to the world.

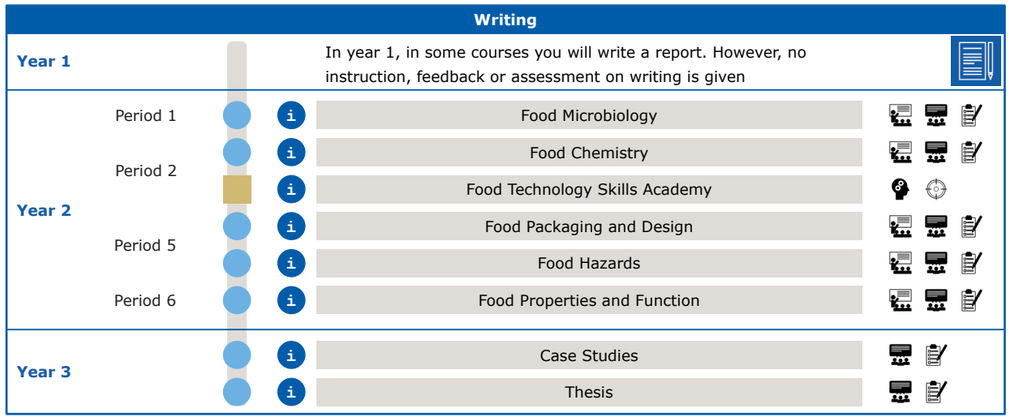


Figure 2. Example of a visual overview of a skills learning trajectory (adapted from the *Bachelor Food Technology*)

For all these purposes a personal and professional development track is a suitable way to guide students. Such a track then also serves as a recognisable thread for students to reflect on their general skills acquisition. And within the track, students develop personal leadership and reflection skills. The tracks programmes implemented consist of (1) group meetings in which students reflect on their (skills) development and future career, (2) reflective assignments, and sometimes also (3) tutoring or mentoring. This process was supported by a learning environment in Brightspace and three programmes piloted the portfolio tool "Portflow".

Examples

The *Bachelor Marine Sciences* has a Boundary Crossing and Personal Leadership Trajectory, consisting of a 3 ECTS core course, followed by a "ribbon component" of assignments embedded in BMS courses, supported by tutor meetings. (See page 35)

The *Bachelor Soil, Water, Atmosphere* created a Personal Development Path that addresses issues that were hindering students' academic and professional growth: insufficient emphasis on the professional field, academic skills and scientific development, a lack of connection between research and its applications and societal relevance, difficulty grasping connections between courses, and inadequate reflection on skills and the role of Earth Sciences in society when selecting courses for their third year and MSc studies. (See page 37)

Adapt to the level and pace of students

Recognise that students begin with varying starting positions and levels of skill competence. It is essential to consider what skills individual students have mastered at different stages of the curriculum and how they are guided in acquiring new skills. Tailoring support and instruction to meet students at their current level ensures effective skill development and fosters meaningful progression throughout their academic journey.

For student's involvement and motivation and the effectiveness of skills education "just in time"-teaching is important. For example, when students are offered a skill instruction in their first year, without being aware of their lack of competence, or without needing the skill at that point in time, they are likely to have forgotten the instruction in their second year, when they might actually need it for an assignment. For some skills the optimal timing is predictable, but for many skills it is personal. For example, guidance in the development of collaboration skills is very effective at the moment students encounter troubles in group work. To optimise this timing, consider allowing students to develop specific skills in different study phases.

Give some room for personalisation

Developing personal leadership demands some freedom for students to personalise their skill development plans based on their preferences and career aspirations. Besides giving students some freedom to develop skills in different study phases, also consider allowing students to develop skills based on personal preferences. A foundation for all skills for all students is important to guarantee the baseline. In addition to that foundation, programmes can add room for specialisation and personalisation, by offering a diverse range of activities and resources.

Example

The *Bachelor Soil, Water, Atmosphere* started with a uniform approach for all students. The evaluation shows that a more personalised, flexible approach with optional activities would help students' perceived relevance. (See page 37)

Stimulate self-reflection

Self-reflection helps students evaluate their progress and actively guide their learning. Not grading self-reflections encourages genuine reflection, rather than students writing what they think will earn them a high grade. A portfolio system aids in collecting (self-) reflection moments and helps students evaluating their progress over time. Encouraging self-reflection and self-assessment is essential for students to critically evaluate their work and actively manage their learning journey. Timely and constructive feedback from teachers, peers, or stakeholders helps students identify their strengths and areas for improvement. Reflection works best if people can choose a personally suitable mode. A student that has a certain degree of freedom in choosing the social configuration (individually or group), location, time and method (written, audio/video, visual forms) of reflection will be able to align the process with their capabilities, resulting in more meaningful outcomes.

Examples

Several programmes, such as the *Bachelor Biotechnology*, the *Bachelor International Land and Water Management*, and the *Bachelor Plant Sciences* make use of career orientation assignments to help students reflect on the importance and significance of skills, hand helping them to fit skills learning objectivies to their personal objectives and preferences. (See pages 29, 34, 36)

The Personal Development Path of the *Bachelor Soil, Water, Atmosphere* contains non-graded reflective assignments that shape and guide deliberate learning. (See page 37)

2.6 Make use of authentic experiential education

Identify authentic experiential education
Authentic education ensures learning processes that are purposeful, relevant and impactful for learners. This type of education goes beyond rote memorisation, fostering critical thinking, creativity and practical application. Such education connects with students' interests, experiences, and real-world challenges. This type of education allows students to develop a multiple skills at the same time, as well as knowledge, personal values and attitudes.

Several courses within programmes make use of authentic education, such as problem-based education, project based learning, transdisciplinary learning and real-life learning. These courses make use of real or realistic challenges and sometimes include clients. Nature-inclusive education is an approach that integrates nature in the educational projects.

This type of education offer opportunities for the acquisition of skills. For example, all group learning activities require interaction. This gives learning opportunities for skills like collaboration, inclusivity and diversity, personal leadership, reflection and feedback. With the right conditions, such as a safe space and teachers that are able to guide and coach, students can acquire skills by working on their project goals.

Identifying this type of courses within programmes, as well as adding more of this type of education strengthens skills learning trajectories. Authentic education is designed to be genuinely useful in the broader context of the study programme, rather than becoming a 'checklist' exercise. Most of the sixteen skill are often easily identified in this kind of courses. By adding visibility, explicitness and instruction to these present skills, conscious and deliberate acquisition of skills can then be enforced. Examples of how this can be done are naming the skills, adding skills learning objectives and rubrics, and providing instructions, manuals and tools that support students in their skills acquisition.

Examples

The course "Food Innovation Research, a Gamma-Beta Approach" in the *Bachelor Management and Consumer Sciences* students work on a product innovation project for an existing company. This course explicitly facilitates the acquisition of collaboration, reflection and personal development, but students also work on other skills like presenting. All of the skills are developed in an authentic, meaningful and realistic context. (See page 27)

In the *Bachelor Environmental Sciences*, the Comenius project "Learning through dialogue" helped teachers and students to become more interculturally competent. Courses with collaborative assignments were identified, analysed, and based on the findings, several new activities were integrated into the curriculum to strengthen intercultural competence (collaboration, social embeddedness and diversity and inclusivity). (See page 31)

Make use of the characteristics of authentic experiential education to enhance reflective learning
Most skill acquisition requires reflective learning. Since reflection is also one of the sixteen skills, one might assume that learning to reflect is a goal in itself. However, for all skills, it is important that they are offered in a meaningful and coherent way; for reflection this is even more essential. If students are asked to complete reflection assignments without understanding their purpose or benefits, they can easily lose motivation or develop a negative attitude towards reflection.
Real-life, society-based education and collaborative learning environments offer the best opportunities to engage students in developing reflective skills. This is because a novel sensemaking process occurs when students encounter new, meaningful challenges. These complex environments are rich with situations, actions and assumptions that are unclear or unresolved, and the student is subjectively involved in them. These learning environments are applied, contextual, and relational, offering mirrors to students: Who am I to becoming as a professional, and where do I stand now?

Develop agency through social embeddedness and impact
The skill "social embeddedness and impact" is most effectively implemented through authentic and experiential education. Instead of simply teaching or explaining how a study domain is connected to society and can contribute to positive impact, this type of education allows students to learn through experience. This approach students develop a sense of agency and an understanding of the scope of the impact they can make. In this way, students not only gain insight into social embeddedness and impact but also grow in their personal leadership skills. The Society Based Education Team offers a wide range of support in implementing real-life learning.[9]

Example

The course "Design in Land and Water Management II" in the *Bachelor International Land and Water Management* is a second year course that integrates previous learning in a case assignment. A portfolio helps students to reflect and is supported by a 15-minute mentoring session with a staff member. As a result, students feel encouraged in skills development and realise the value of the adressed skills. (See page 33)

2.7 Focus on formative assessment

Define the assessment strategy for the skills learning trajectory
Wageningen University sees assessment as an integral part of education.[9] Designing and implementing skills learning trajectories, includes a strategy for the longitudinal assessment of skills in the programme. Throughout their study programme, students will experience all kinds of activities where they can practice and demonstrate skills. Some of these will entail explicit evaluation, where the quality of a student's performance or product is assessed. The result of such an assessment can be used for grading or pass/fail marking, making it a summative assessment decision. But much more often results will be used to generate feedback without grades or decisions attached to it, meaning it is a formative assessment.

It is up to a programme to decide whether and for which of the skills a final summative decision is necessary to ensure the programme's learning outcomes are met. It is important to recognise that not every one of the sixteen skill needs to be evaluated through explicit summative assessments, and not every time a skill is assessed, the outcome should be used in a summative way.

Include skills learning as additional goal in the course assessment strategy
Course assignments will often include skills, for instance in the writing of a report, or in group collaboration. However, this does not mean that in every assignment the level of performance on these skills should be graded. Providing feedback generated through formative self-, peer- and/or teacher assessment allows students to practice and learn how to improve their skills. Assessment without scores, grades or decisions attached allows students to safely take roles they are not good at yet, to dare to experiment and to focus on development.

Including the relevant skills as 'additional goals' in the course makes it clear for students, programme management, and teachers that the course offers formative assessments for these skills, alongside the summative assessments for the course's learning outcomes.

Be transparent about the goal of assessment and criteria
Transparency is critical; students should understand how their skills are assessed and what criteria are used. Using a consistent rubric throughout the programme can help monitor skill development and foster a common understanding of quality among students and teachers across courses. Additionally, a portfolio system can effectively track feedback and self-reflections, and showcase skill development over time. If well-designed, it can help students take agency of their learning, using formative assessments and feedback to steer their learning in the desired direction.

Make sure students receive effective feedback
For being effective, feedback should be specific and timely and provide students with constructive suggestions on how to improve their performance in a next occasion (feedforward). Such "feedforward" helps students understand what they can do to enhance their skills, promoting continuous learning and growth.

To use this feedforward effectively, it is essential that students recognise how tasks in the skill learning trajectory and broader programme relate to one another. Teachers have a role in making this explicit to students, by referring to related prior and subsequent assignments and formative assessments in the skills learning trajectory.

Choose fitting assessment methods that foster student's learning
Some skills, like writing or presenting, are expressed in observable products or behaviours, the quality of which can be evaluated relatively easily. For other skills, such as ethics and personal leadership, the level of mastery is less easily observed and harder to measure. The much-used reflection report may not always be the most valid way to express competence. Interactive assessments such as

Examples

The *Bachelor Environmental Sciences* started the skills academy pilot to explore how students can monitor and evaluate their skills learning by using elements of the educational concept 'programmatic assessment'. During five meetings, students engage in formative assessment of their own and each other's learning, create learning goals and gather evidence about their skills development in an online portfolio. At the end of the trajectory students have an assessment dialogue with a committee to evaluate their skills development. (See page 30)

The *Bachelor Biotechnology* together with students and alumni co-created a rubric on technical and soft skills essential for the biotechnology programme and future careers. Students use this rubric to reflect on their skills development. A key lesson learned is that it is not necessary to assess the reflection process with summative evaluations of reflection reports. Creating an environment where students can reflect in their own way and track their development has proven to be more effective. (See page 29)

role-playing scenarios, observations of performance in projects and tasks that do not have standardised outcomes, may be much more informative on skills development and better serve students' learning. Situational judgment tests, such as are used in medical education and recruitment for job applications, can be useful for assessing which actions or behaviours students see as most appropriate or inappropriate in a fictive case. Other tools, used in the field of human resources, such as a motivational compass or a value test, can enhance self-awareness and serve as a starting point for further dialogue.

More information on assessment and e.g. the assessment strategy format is available on the assessment quality intranet site.[10]

2.8 Use EdTech tools for skills development

Leverage EdTech tools in skills education
The integration of EdTech tools plays a crucial role in enhancing the implementation of skills education. These tools serve as powerful enablers aligning learning activities, assessment, and feedback with the intended skill outcomes. By incorporating EdTech tools, students can enhance personal development in areas such as collaboration, feedback, reflection, and personal leadership, while also strengthening their communication skills.

These tools promote independent learning by providing real-time feedback, encouraging self-reflection, and fostering accountability throughout the learning journey. Tools are accessible in WUR's online learning environment Brightspace. Features like automated feedback and structured peer assessments empower students to identify areas for improvement and refine their skills without constant teacher intervention. Additionally, EdTech tools equip teachers with the resources to guide, evaluate, and scaffold students' learning more effectively. They streamline feedback and collaboration processes, allowing teachers to focus on targeted support rather than manual assessment tasks. Together, these benefits create an engaging, efficient learning environment that supports both students and teachers.

Empower collaboration skills through group member evaluation
Collaboration is essential for groupwork, and EdTech tools like FeedbackFruits' Group Member Evaluation Tool directly support this skill. The tool enables students and teachers to gain insights into team dynamics by prompting students to critically assess both their own and their peers' contributions. This process fosters accountability, engagement, and deeper learning, while encouraging students to reflect on their roles before assessing others. Teachers can customise peer review criteria, use qualitative feedback or rubrics, and detect outliers through built-in analytics, enabling fair and transparent collaboration. This tool empowers students with greater responsibility and enhances teamwork dynamics.

Enhance feedback skills with the Peer Review Tool
The ability to give and receive feedback is essential in both academic and professional contexts. At WUR, FeedbackFruits' Peer Review Tool was implemented within the skills learning trajectories to guide students through structured peer assessments. This tool allows flexibility, enabling students students to review peers within their group or provide feedback to others outside their group.

By practicing constructive and actionable feedback, students not only help their peers improve but also receive feedback on the quality of their own feedback. This dual approach sharpens their ability to articulate valuable feedback and deepens their understanding of quality standards. The feedback cycle supported by these tools fosters a reflective mindset, promotes continuous improvement, and encourages students to take ownership of both giving and receiving feedback.

Improve writing skills through automated feedback
The FeedbackFruits Automated Feedback Tool was used in the skills learning trajectories to help students improve their writing. This tool provides formative feedback based on preset criteria, enabling students to identify areas for improvement and enhance their communication skills to meet learning objectives. Teachers can customise the feedback criteria according to assignment types, addressing aspects such as grammar, citation, academic style, and structure. Students receive real-time feedback on content, language, layout, and references, allowing them to make immediate improvements.

The tool also offers teachers class-wide analytics to track student progress and provide targeted support. These features help students refine their writing skills to meet academic and professional standards, ensuring continuous improvement.

Foster reflection and engagement through Wooclap
Wooclap is a tool that facilitates interactive learning by offering over twenty question types, including Multiple Choice, Fill in the Blanks, and Word Cloud. As part of the skills project, Wooclap was used to share experiences and stimulate discussions, encouraging reflection on shared challenges. By collecting collective insights, Wooclap provides a dynamic platform for engagement, enabling teachers and students to connect through meaningful and collaborative learning experiences.

Build reflection and personal leadership with portfolio tools
Personal leadership focuses on taking ownership of one's learning and development. During this project, the portfolio tool Portflow was implemented as a pilot, which will continue for a while longer to assess its effectiveness and determine whether to proceed with a procurement process for a portfolio tool that supports the integration of skills learning trajectories.

In Portflow, students can make their developmental progress visible and accountable by collecting evidence of their achievements, seeking feedback from teachers, peers, and others. Teachers are able to provide necessary scaffolding throughout this process, offering guidance when needed, while the primary responsibility for the learning journey remains with the students. This autonomy helps foster personal leadership skills by promoting self-awareness, goal-setting, and accountability, empowering students to take control of their own development.

Examples

The *Bachelor Food Technology* used Wooclap to foster reflection and discussion among students by gathering general experiences related to common challenges in their studies. Through Wooclap, students shared insights and became aware of shared struggles. (See page 32)

Three programmes participated in the Portflow pilot: The *Bachelor Food Technology*, the *Bachelor Soil, Water, Atmosphere* and the *Bachelor Environmental Sciences*. They used the tool to help students keeping track of their development. (See page 30)

2.9 Give attention to teacher's competencies

Distinguish teaching roles
Not all teachers are or have to be skills teachers. Different roles can be fulfilled by different teachers. It is contra-productive if a teacher has no affinity for a certain skill but is forced to guide students. It is recommendable to find people who are already well disposed to teaching skills. For some of the skills "skills experts" (e.g. skills teachers from ELS or the Library) can be deployed in courses. To maintain integration and significance, also when staff changes, it is important that the collaboration between teachers and experts is well coordinated by a skills coordinator.

Mentors or tutors can play a significant role in students' acquisition of skills and are sometimes seen as having a key role in students' personal development tracks.

Help teachers create conditions for skills education
Skills education differs from traditional knowledge-oriented education. For many of the skills psychological safety is a condition. Small groups are helpful. Skills education demands specific teaching skills, such as giving feedback, coaching and being a role-model, and facilitating group conversations. It also demands a process-focused attitude.

Provide professional development for teachers
To fulfil their role, it is important for teachers to have access to the right professionalisation opportunities. This professionalisation should not only focus on skills such as giving feedback, coaching and leading group conversations, but also on role awareness (being a role model) and preconditions for learning. For example, creating psychological safety could be explicitly part of UTQ courses. For teachers/tutors that are involved in personal development tracks a specific course about psychological safety and personal leadership could be provided.

To be able to teach a skill, one needs to have proficiency in that skill. This means it is important that teachers develop reflective skills. This is also the first step in being able to be a role model, by showing reflection skills in class, mentioning moments that are worth slowing down, or inquiring into a situation or assumption.

During the project several workshops contributed to awareness and knowledge sharing amongst teachers. Also, podcasts were recorded to inspire teachers. A next step would be to develop a structural professional development offer that fits the skills learning trajectories for WUR teaching staff.

Practices

The practices and examples from programmes described on the following pages are intended to inspire and provide valuable insights for the further development of skills education. These examples showcase the diverse approaches taken within WUR and highlight practical applications that can inform future initiatives.

If you are implementing skills learning trajectories at WUR and wish to explore a specific practice in more detail, you are encouraged to contact the person(s) listed in the practices via email. Your colleagues are happy to share visuals, concrete assignments, and other relevant materials.

Choosing a skills academy environment

Programme: **Bachelor Animal Sciences**
Contact: Inge Palm
Skill Focus: Writing, Presenting, Collaboration, Boundary Crossing

Context
In the Bachelor Animal Sciences (BAS) programme, a need was identified for a single digital environment for all Skills Academy related information and assignments. The aim was to increase visibility for students, make them aware it is a course they receive credits for, and allow them to track their own progress. The Skills Academy at BAS is part of a 3-credit course (YAS21303) programmed alongside the BSc thesis in year 3. To pass, students need to complete reflection assignments, attend meetings, take training, and follow a personal assessment trajectory throughout the 3 years of the programme. In effect, the course is a continuous course, although students register for it (and gain access to a Brightspace site) in year 3.

Approach
Two approaches were tried:

1. Using the BSc programme Brightspace site for all Skills Academy and personal assessment assignments. This required discussion with the Brightspace team as initially using programme sites for educational assignments was not allowed.
2. Creating a separate 0-credit course programmed in year 1. This required discussion with scheduling and the programme director.

Key Results
In approach 1 the Skills Academy assignments were a separate module in the programme Brightspace. The modules in the programme Brightspace were intended for study advice and study programme related information to students; the Skills Academy module contained yearly reflection assignments with peer feedback.

In approach 2 a new first-year course (YAS21400) was created. New students are automatically registered for this course in period 1 of year 1 and remain registered (and thus have access to the Brightspace site) throughout their BSc. This was a Brightspace environment exclusively for the Skills Academy assignments and information, and fit fit the Wageningen structure that a Brightspace site for learning is connected to a course.

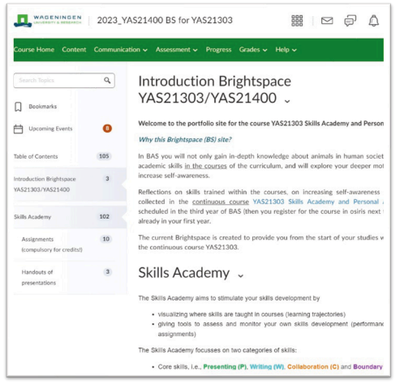
Impact
Students experienced approach 1 as confusing, because the programme Brightspace site has a different purpose (to inform) than the Skills Academy module (to learn and teach). In addition, students worked with another Brightspace site when they registered for YAS21303 in year 3. AS a result students needed to visit 2 Brightspace sites for the different activities within a single continuous course.

With approach 2, the first confusion was solved, as students now had a course Brightspace for learning activities and communication about the course. We also hoped to include the year 3 assignments (when students register for YAS21303) in this YAS21400 course. This was not doable for the teachers, because students joining YAS21303 come from multiple cohorts, and YAS21400 is cohort-specific.

Lessons learned
The most important outcome is that we have not yet designed a way for students to use a single Brightspace for all activities related to the continuous course Skills Academy and Personal Assessment. We have increased student awareness with the YAS21400 site, our communication via that site about all aspects of the Skills Academy, and the more extensive referral between the YAS21400 and YAS21303 BS sites.

The challenges were related to the current situation that continuous courses cannot be programmed. The two approaches we worked with were the result of discussions with the Brightspace team, the WU BSc skills core team and scheduling.

In the near future we keep talking with the Brightspace support team to discuss best options in Brightspace to enhance student involvement and limit administrative load for students and lecturers. We keep talking to other programmes to share experiences. And we keep updated on WU developments with respect to the organisation of continuous courses.



Enhancing collaboration in a professional setting

Programme: **Bachelor Management and Consumer Studies**
Contact: Lotte Pater
Skill Focus: Collaboration, Reflection, and Personal Leadership

Context
The second-year bachelor's course 'Food Innovation Research, a Gamma-Beta Approach' aims to equip students with practical research and innovation skills specific to food product development. The main objective is to give students real-world experience by having them work on product innovation projects sourced directly from industry. The course pays significant attention to personal development, with a particular focus on improving collaboration skills. Students learn how to collaborate effectively in teams and reflect on their own roles and contributions within group work. The need for this module arose from the importance of collaboration in professional settings, especially within diverse, multidisciplinary teams.

Approach
The module is structured around a product innovation project for a company, with students grouped into teams of six. Special attention is given to creating diverse teams, considering factors like gender, study background, and personality profiles based on a first-year assessment ("I screen" test). This approach aims to form teams that are both complementary and challenging in terms of collaboration dynamics.

The module includes distinct phases: an introductory workshop focused on individual and group reflection and goal setting, followed by three check-in points (beginning, middle, and end) where students evaluate their goals. Both individual and team goals are set, and feedback is given in pairs instead of in the entire group to encourage students to follow each other's progress more closely and offer targeted support in developing their collaboration skills.

Instead of traditional written reflection reports, students are required to present their learning process in a PowerPoint presentation with voice-over. This format was chosen to encourage students to reflect more honestly and personally, as prior reflections were sometimes shallow or overly reliant on AI tools like ChatGPT. The presentation approach pushes students to delve deeper into their collaboration experiences and developmental steps.

The assessment process involves three components: a presentation to the company to assess the students' ability to communicate their research effectively to a professional audience, a decision paper summarising the project and its outcomes, and a reflective component. Students receive ongoing verbal feedback during discussions, and a final grade based on their overall performance.

Impact
Students responded positively to the alternative reflection format and the duo-feedback system. Receiving one-on-one feedback allowed them to follow each other's progress more closely and offer meaningful support. Teachers noted an increase in the depth of students' reflections compared to previous written reports. However, the presentation format requires more time from both students and teachers, potentially increasing workload. Some unexpected dynamics, such as challenges in communication and role division within diverse teams, emerged but were generally resolved positively.

Lessons Learned
The personal presentation format of reflections gave students a better understanding of their collaborative skills and motivated them to reflect more seriously. The duo-based feedback system proved more effective than group feedback and may be applied more widely. Balancing intensive support with the time investment required from instructors was challenging. For the future, the goal is to further refine the duo-feedback model and explore ways to implement less time-intensive reflection formats without sacrificing quality.

Our goal is to create learning trajectories throughout the programme. This second year course draws on a test students do in the first year, guided by a study-advisor. We see opportunities to build on the skills and insights students develop during this course by making an explicit connection with other course in the programme.

BBN

Implementing an information literacy learning trajectory

Programme: **Bachelor Forest and Nature Conservation**
Contact: Gijs Elkhuizen and Leonie Kamminga
Skill Focus: Information Literacy

Context
Information Literacy, the ability to find, evaluate, and use scientific information ethically, is a crucial skill for all students. However, it was observed that Information Literacy training during the first year of the Bachelor Forest and Nature Conservation (BBN) was neither remembered nor applied throughout the remainder of the bachelor, including the BSc thesis. To ensure a basic level of proficiency in this skill for all students by the end of the bachelor and to increase student awareness, BBN conducted a pilot project to implement a learning trajectory for Information Literacy.

Approach
A project team including various stakeholders carried out the pilot following the project-driven creation approach. The Information Literacy experts from the WUR Library's Team Education Support developed a learning trajectory based on the learning outcome matrix. This trajectory consisted of several modules integrated into existing courses while maintaining constructive alignment. The skill experts, programme director, and course coordinators collaborated to optimise the placement and integration of the skills learning trajectory. Despite some hurdles, a Brightspace page for skills in BBN was developed, allowing students to access learning materials and track their progress. The learning trajectory was continuously evaluated, leading to improvements and the decision to maintain the trajectory in the BBN programme.

Key Results
- The Library's Team Education Support skill experts developed all learning materials, conducted classes, and managed assessment, ensuring a consistent learning trajectory and reducing workload for subject-matter teachers.
- Information Literacy modules were developed based on agreed levels in the learning outcome matrix and the content of selected courses, and integrated into the curriculum, offering the skill in a meaningful context and providing learning activities just-in-time for projects or assignments.
- The trajectory was visualised to provide students with an overview and the ability to track their progress.
- Edubadges were tested as a motivational incentive but showed no clear added value within the current educational framework.
- Both formative and summative assessment were applied, using tools such as self-assessment, readiness assurance tests, interactive classes with Wooclap, battles, and in-class assignments. Summative assessment involved students independently searching, evaluating, and using scientific literature on their topic, which was graded using an analytical rubric.

Impact
The implementation increased the visibility of Information Literacy, with students becoming more aware of their progress. In courses with explicit Information Literacy education, students received guidance and structure. Although students and course coordinators sometimes perceived the skill training as extra work, and students didn't always see immediate benefits, most valued the skill by the time they reached their BSc thesis.

Communication between parties was key in implementation. Having Education Support handle assessment and administration saved time for course coordinators, though tracking edubadges and students with study delays could be time-consuming.

Some course coordinators noticed improved use of scientific literature in final products like reports or review papers. Based on student feedback about heavy workload, the learning materials were adjusted, creating a package more easily applicable in other bachelor programmes.

Lessons Learned
- Embedding skills coherently into the programme and connecting learning trajectories to programme content is crucial. It is important to demonstrate that skills learning trajectories create better academics, as they can be perceived as extra work.
- Edubadges weren't yet perceived as valuable within the current educational framework, as Information Literacy is required to pass courses. However, the trial helped test the approach for potential future use.
- Making skills learning trajectories visible provides students with overview and progress tracking abilities.
- Involve skill experts when implementing skills and maintain clear communication between all parties. Analysing existing activities in detail to determine which skills are already present and consulting with skill experts is beneficial.
- Keep the end goal in mind: delivering academics at BSc level who are well-trained in both content and skills.
- Determining workload in ECTS and integrating it into the existing education system (Brascamp/EMC/ODB) helps embed the financial aspect as well.

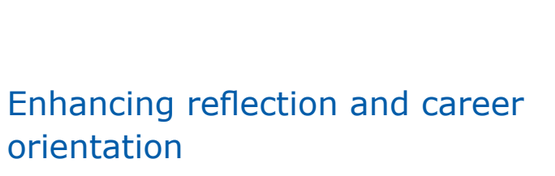
BBT

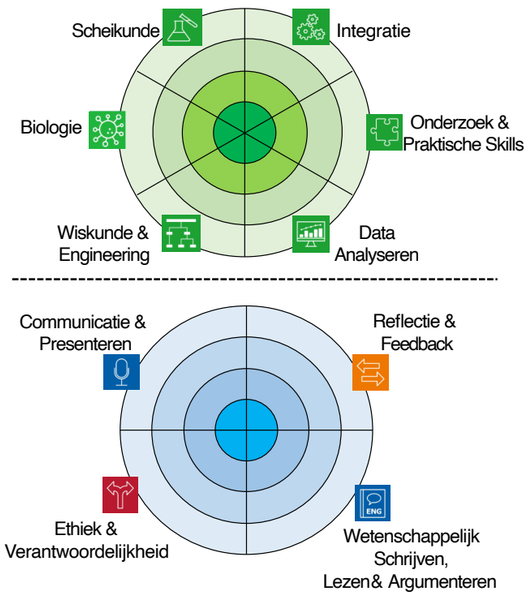
Enhancing reflection and career orientation

Programme: **Bachelor Biotechnology**
Contact: Robert Smith
Skill Focus: Personal Leadership, Reflection

Context
In the context of the biotechnology programme's upcoming accreditation, some points of improvement have been identified. Students reported challenges in writing reflective reports and expressed a desire for alternative methods to reflect on their development. Additionally, there was a lack of information about potential career opportunities following graduation.

Approach
To address the issues, a team was formed, consisting of the programme director, three lecturers/study advisors, including one with a background in psychology, and a current master's student member of the programme committee who was exploring her own career options. This team developed several products to help students reflect in a way that fits them and to actively orient themselves towards their career.





Key results
- A skills rubric was developed, focusing on both technical and soft skills essential for the biotechnology programme. Key competencies such as communication, reflection, ethics, and scientific writing were included. The fourth level of the rubric ("Ik beheers dit") is in line with the learning outcomes of the programme.
- An alumni survey was created and conducted to gain insights into their career paths.
- Alumni were also interviewed to discover which skills are vital for their roles. These skills were in line with the rubric above, thus enabling current students to align their skills/rubrics with future career opportunities.
- This approach was integrated into the courses, encouraging students to regularly revisit the rubric and actively reflect on their development.

Impact
The initiatives have been positively received by both students and faculty. Students participated in the development of the rubric and related exercises, and initial feedback is promising. Most students completed the assignments, showcasing a range of ambitions, from working at large companies to starting their own ventures. The alumni interviews now provide a clear overview of possible careers, aiding current students in clarifying their goals.

The implementation of the new reflection and skills rubrics offers students a structured way to develop their competencies and understand the skills necessary for their future careers. This system not only fosters self-reflection but also helps students to be better prepared for the job market by illustrating which skills are relevant for various positions within biotechnology. For teachers, we envision that the rubrics can help stimulate students to find complementary study partners or group members for exercises such that students can learn from one another.

Lessons learned
A key lesson learned is that it is not necessary to assess the reflection process with summative evaluations, as this may lead to resistance from students and teachers. Creating an environment where students can reflect in their own way and track their development has proven to be more effective. It is also crucial to communicate that while individual weaknesses are acceptable, all individuals should reach a required minimum level by the end of the BSc programme and learning and development in all areas will continue in later life.

A skills academy pilot

Programme: **Bachelor Environmental Sciences**
Contact: Mattijs Smits, Marijke Veugen
Skill Focus: Collaboration, Personal Leadership, Entrepreneurial Skills, Researching, Diversity & Inclusivity, Social Embeddedness, Systems Thinking

Context
In the Bachelor Environmental Sciences (BES) programme, skills needed to be better integrated into the curriculum. As a first step, core skills were chosen, and an overview was made using the 'fingerprint' to see how these skills were represented in the courses. This revealed that some core skills were not fully present or required more attention to develop over time. To address this, the BES Skills Academy pilot project was initiated, running from January 2024 until December 2025, with seven students participating as volunteers. The main aim was to explore how students monitor and evaluate their skills learning by using elements of the educational concept 'programmatic assessment'.

Approach
The BES Skills Academy was designed based on the Bachelor Food Technology (BFT) model. Five meetings are planned in the students' schedules, initially in their free time but with the intention of integrating them into the curriculum in the future. During the meetings, students engage in formative assessment, including gathering evidence about their learning in an online portfolio (Portflow), creating learning goals, completing rubrics, and providing peer feedback to assess their own and each other's learning. At the end of the project, students have an assessment dialogue with a committee consisting of an assessment expert and a BES study advisor to discuss their progress and evaluate their skills development.

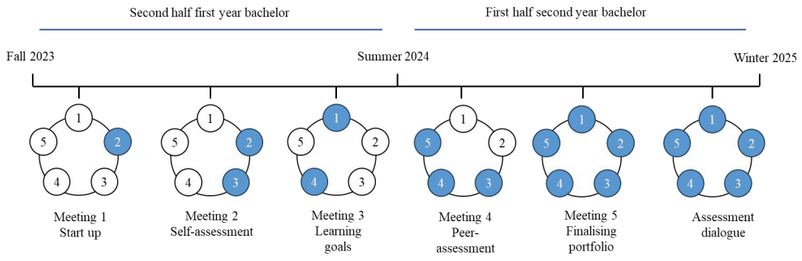
Key results
As the pilot project is nearing completion, the final results are yet to be determined. However, the project has already yielded valuable insights into setting up a skills academy, working with an online portfolio tool, involving students in the process, and gathering ideas for skills assessment. Student interviews are being conducted and analysed to generate more concrete results. The BES curriculum is being redesigned, and it is expected that a form of the skills academy will be integrated, likely through a ribbon course.

Impact
The students participating in this pilot programme did so voluntarily in their own time, indicating their motivation to engage in skills learning and recognising the added value for their personal development. Reasons for participation varied, from seeking extracurricular activities to gaining insight into their skills development, but all students expressed satisfaction with their involvement in the project. However, contact with other bachelor programmes that are also integrating skills into their curricula has revealed that there are always students who are less motivated to engage in skills learning, primarily due to the emphasis on reflection activities.

Lessons learned
An advisory report created with skills coordinators from other bachelor programmes will be shared soon, containing recommendations on implementing learning trajectories and assessment for skills.

Key advice includes:
- integrate skills learning into courses;
- relate the skills course to the content of other courses in the programme;
- make the skills course mandatory and part of the curriculum;
- involve course coordinators in implementing and making skills learning more transparent.

Challenges to consider include:
- scheduling and structuring a skills course within the curriculum;
- determining the appropriate number of skills to focus on;
- selecting the best supportive tools for skills learning and assessment.



Developing intercultural competence

Programme: **Bachelor Environmental Sciences**
Contact: Mattijs Smits
Skill Focus: Intercultural Competence (Collaboration, Social Embeddedness, Diversity & Inclusivity)

Context
The Bachelor Environmental Sciences (BES) programme attracts students from various countries and backgrounds. Previously, little attention was given to how students should work together effectively. The Comenius Fellowship project 'Learning through Dialogue' aimed to help teachers and students become more interculturally competent. The goal was to develop and implement a learning trajectory for intercultural competence within the programme. To do so we focused on enhancing three skills related to intercultural competence: Collaboration, Social Embeddedness, and Diversity & Inclusivity.

Approach
We began by gathering information about how intercultural competence and specifically the three selected skills were already present in courses within the bachelor programme.

Our approach involved:
1. Selecting five core, compulsory courses that emphasise multi- and interdisciplinary projects.
2. Analysing existing course materials, including manuals and study programmes, to identify elements of intercultural competence already present.
3. Commissioning a student to collect information from fellow students across different study years, by asking them about their experiences learning these skills. The student even wrote a thesis on the topic.
4. Interviewing course coordinators to validate our findings and discuss potential improvements.

We created an overview of the findings, summarising key points per skill. For example, what we found relating to the skill of Diversity & Inclusivity was that students and teachers all felt a need to pay more explicit attention to learning this skill. We concluded that in some courses, there were already some conversations happening touching upon Diversity and Inclusivity, but they could be better structured and better guided.

We then developed a plan for skill progression:
- Level 1: Introducing the skills in first-year, first-period courses
- Level 2: Developing the skills in late first-year and early second-year courses
- Level 3: Advancing the skills in late second-year courses

Key results
Several new activities were integrated into the curriculum:
- Diversity & Inclusivity Workshop: To develop the skill 'Diversity & Inclusivity' first-year students explored the diversity within their cohort and discussed how various backgrounds shape perspectives and values.
- Environmental Justice Dialogue: To develop the skill 'Social Embeddedness' we implemented a structured dialogue on environmental justice in the second semester of the first year. This activity aimed to deepen understanding of a critical issue while improving listening and perspective-taking skills.
- Stakeholder Perspective Exercise: In a second-year course, students participated in a stakeholder perspective exercise, to further develop 'Social Embeddedness'. They were tasked with adopting the viewpoints of various stakeholders in a discussion about nuclear energy, encouraging them to consider environmental challenges from angles other than their own.

Impact
Students reported feeling better prepared to approach complex environmental challenges from multiple angles, recognising that these issues often require nuanced, multi-faceted solutions. Teachers observed that students demonstrated increased awareness of diversity within their peer group and improved dialogue skills, particularly in listening and considering multiple perspectives, yet they also observed that students still found it challenging to adopt perspectives different from their own, highlighting the importance of explicitly teaching intercultural competence.

Lessons learned
Several important lessons emerged from this initiative:
- It is helpful to connect the development of a skill learning trajectory to other ongoing projects within the study program, involving colleagues from related initiatives for input, collaboration and relevant expertise.
- When evaluating activities, it is important to include the viewpoints of different stakeholders. Think of: teachers, student assistants, students and also external stakeholders, such as internship mentors or clients.
- Intercultural competence needs to be explicitly taught.
- Moving forward, we plan to refine the activities based on feedback and ensure these skills are more systematically addressed. Our advice to others is to start small, integrate student feedback, and continuously adjust based on both student and teacher experiences.

Developing skills academy meetings

Programme: **Bachelor Food Technology**
Contact: Melanie van Berkum
Skill Focus: Personal Leadership, Writing, Researching

Context
The Food Technology (FT) programme lacked explicit moments for skills development in which students could interact and reflect on their skills. To address this, Food Technology Skills Academy (FTSA) meetings were introduced, providing students with opportunities to discuss experiences and reflect on their development.

Approach
The FTSA meetings were designed as interactive sessions where students could share their experiences and challenges related to skill development.

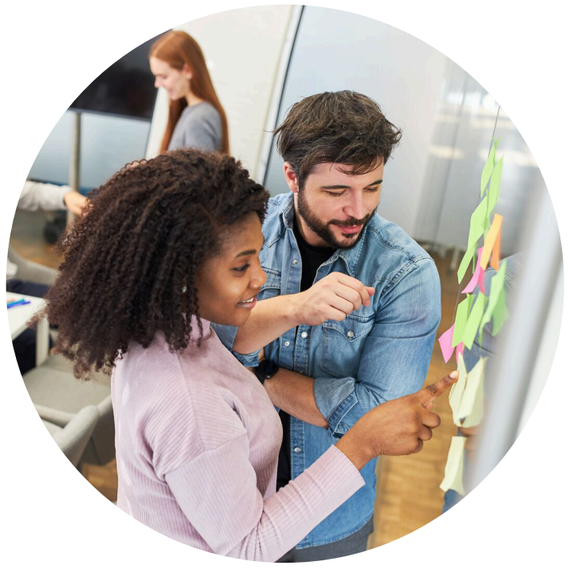
The approach included:
- Scheduling meetings within the course timetable to encourage student participation in these non-compulsory sessions.
- Focusing on personal leadership in the first year (two meetings) and writing and researching in the second year (one meeting)
- Using Wooclap to share experiences and encouraging discussions, as many face similar challenges without realising it.
- Conducting all activities in class, without preparation or homework, to ensure equal starting points and genuine reflection. By expressing their thoughts in in-class reflection assignments, students are encouraged to not overthink their answers and not able to copy work from others.

Key results
The first-year FTSA meetings on personal leadership, guided by the skills coordinator and a study advisor, followed a structured format:
1. Large group: gathering general experiences through Wooclap to initiate reflection and awareness of shared challenges. Students were asked to choose two topics they were interested in to further reflect on.
2. Individual and small groups:
    - reflecting individually on chosen topics through writing or visualisation;
    - discussing reflections, challenges, and tips with peers;
    - setting a personal goal related to each topic.
3. Individual: completing a reflection assignment, describing insights and goals, and uploading it to the portfolio.

The second-year meeting on writing and researching included three activities: reflecting on writing or researching skills they found challenging, sharing experiences and tips, and completing a reflection assignment in which they write down their experiences and set a personal goal.

Impact
The FTSA meetings have proven to be an effective way to foster skill development, reflection, and peer support within the Food Technology programme. One of the positive impacts observed was the earlier identification and resolution of problems, as students realised the benefits of meeting with a study advisor during the sessions. Moreover, teachers gained increased awareness of the issues students were facing, enabling them to address these topics more elaborately in lectures. Additionally, many students engaged in serious reflection on their skills, recognising the value of the meetings.

Lessons learned
- Scheduling meetings within the course timetable increases perceived importance and participation.
- Offering a variety of topics for personal leadership helps students to pick areas of interest to work on.
- Providing students the opportunity to work on one topic in-depth, as some students prefer more time to explore and discuss a single topic.
- Inviting study advisors to personal leadership meetings facilitates immediate support for students facing challenges.



Developing personal leadership skills

Programme: **Bachelor International Land and Water Management**
Contact: Kees Blok
Skill Focus: Personal Leadership

Context
The Bachelor International Land and Water Management (BIL) culminates in an intensive groupwork-based course in the second year, integrating previous learning in a single case assignment. This course offers students the opportunity to practice various skills introduced in earlier courses.

Approach
The course 'Design in Land and Water Management II' incorporates a skill learning line focused on personal leadership. Students maintain a portfolio throughout the course, with three reporting moments:
1. identifying three priority skills for development;
2. evaluating progress at mid-term;
3. reflecting on future skill development frontiers.

The mid-term report is preceded by individual talks between each student and a member of the teaching team. These 15-minute mentoring sessions allowed staff to engage with students differently and encouraged students to dedicate time and energy to their continued skill development.

Key results
The individual talks have several effects:
- Students feel encouraged to challenge themselves in skill development. Skeptical students realise the value of discussing skills, while motivated students receive support in analysing their experiences and forging ahead.
- Staff engage with students in a more personal manner, becoming more attuned to individual growth.
- Internal groupwork challenges are signalled at a relatively early stage.

Impact
The mentoring talks contributed to a shift in student mindset about skill development and reflection. Students became more engaged in the process, took their personal growth more seriously, and showed less resistance to reflecting on personal growth and skills.
The talks also led to improved quality of the subsequent mid-term skills reports, with fewer sub-standard reports and many students redefining their learning priorities or identifying new ways to work on them. Some student groups even felt encouraged to give each other weekly feedback on skill development.

Lessons learned
- Teaching staff have sufficient life experience to act as mentors (although their skills can always be developed further). Their direct observations of student performance add value compared to involving separate study advisors, as teaching staff can provide context-specific guidance. Mentoring should not be delegated to specialised yet remote staff.
- Linking skill development to the upcoming internship motivates students to work on skills. Many students feel they are far from ready for engaging in a professional setting, driving them to focus on skill improvement. The skill development frontier defined at the end of the course could be more explicitly linked to the personal development goals of the internship plan and reflection report.
- Personal leadership can be considered the foundational skill for all skill development, helping students become masters of their own continuing development. This message, introduced at the start of the programme, should be further reinforced throughout to help students make goal setting, evaluating, and setting new goals a professional routine.

Exploring professional fields

Programme: **Bachelor International Land and Water Management**
Contact: Saskia van der Kooij
Skill Focus: Personal Leadership

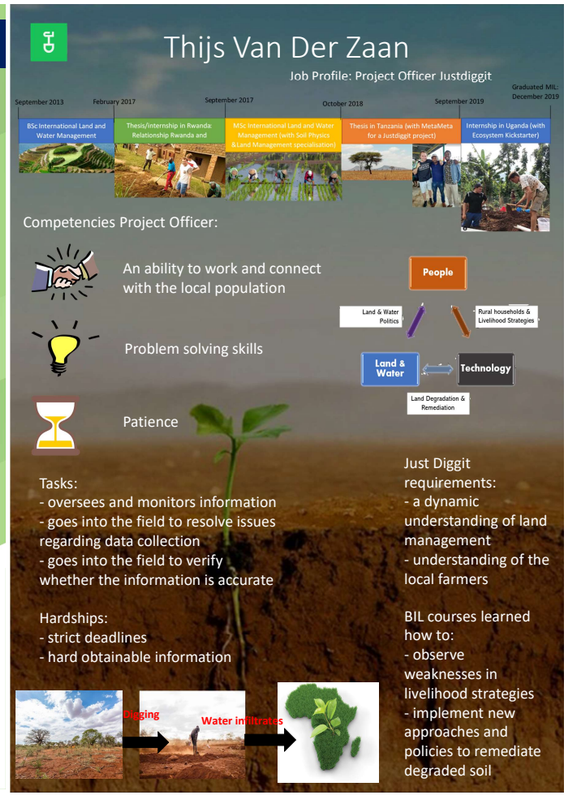
Context
The Bachelor International Land and Water Management (BIL) programme aims to actively engage students by helping them understand the importance of the knowledge and skills being taught. For example, collaboration is an essential skill within the work field, so the programme offers a lot of group work. If students realise the importance of this, they will more actively work on developing their collaboration skills. Likewise, the programme wants to help students choose a minor, internship, and thesis subject in the 3rd year, based on their own interests and personalised learning goals.

Approach
To help students explore the professional field and required competencies, a 3 ECTS course was introduced in the first year. In this course, students interview BIL/MIL graduates about their jobs in small groups, create and present job profile analyses, and practice with real-world questions or cases posed by the graduates.

Key results
At the end of the course, students complete an individual assignment where they identify their "dream job" based on the analysed job profiles or their own interests. They explain why it is their dream job and how they should design their study path to achieve it. Students refer to these job profiles and their "dream job" when planning their internship and thesis later in the programme.

Impact
The course activities help first-year students think about their interests and future career, encouraging them to actively participate in the study programme and demonstrate personal leadership. If students start doubting whether their interests align with the interviewed graduates' jobs, they approach their study advisor for guidance.

Lessons learned
Although thinking about future jobs is challenging for first-year students, breaking it down into guided assignments and small steps makes it possible and useful. This approach fosters more active participation in the study program and encourages students to take charge of their learning journey from the start.



Developing boundary crossing and personal leadership skills

Programme: **Bachelor Marine Sciences**
Contact: Karen Fortuin, Arianne van Ballegooij
Skill Focus: Boundary Crossing & Personal Leadership

Context
The Bachelor Marine Sciences is a new programme with its first cohort starting in September 2023. The international context of the marine domain requires graduates who can collaborate across scientific domains, cultures, and contexts to develop innovative solutions for complex marine issues. To address this, a Boundary Crossing & Personal Leadership (BC&PL) trajectory was included in the design of the BMS programme curriculum from the start. This ensured that staff involved in creating the linked BMS courses were aware of their course being part of this trajectory.

Approach
The BC&PL trajectory was designed as a course with two parts: a core course of 3 ECTS in period 2 of year 1, followed by a ribbon component of individual assignments embedded in six BMS courses throughout the years, supported by tutor meetings. The course invites students to explore the mechanisms of boundary crossing, grow from and recognise situations where these competencies are required, and appreciate and utilise the opportunities presented by working in inter/transdisciplinary and intercultural teams. Apart from Boundary Crossing the course also encompasses development of social embeddedness, diversity, personal leadership, and collaboration skills.

Key results
- The core part focuses on identification and reflection learning mechanisms, explaining the theory of boundary crossing and exposing students to boundary crossing situations through a simulation and case studies. Students are challenged to recognise their own values, perspectives, disciplinary preferences, strengths, and weaknesses, as well as differences with others. At the end of the core component, students formulate individual learning goals to guide their learning path within the ribbon component.
- The ribbon component focuses on coordination and transformation learning mechanisms. In specific cases of the six intertwined courses, students are challenged to collaborate more effectively with others, use differences positively to co-create new concepts, routines, and procedures, and generate innovative solutions together.

Impact
The course has created space for deep learning experiences, opening up new perspectives for students. Some students fully grasped the concept and found it valuable and enriching, while others struggled to understand and were less motivated.
Designing the assessment criteria together with the students has resulted in an assessment connected to their level and encouraged critical thinking about the topic on a meta-level. Students have gained a clearer picture of who they are as marine scientists and what this requires from them in terms of BC&PL. One outcome was that students did not prefer peer feedback on BC&PL, as it is quite personal and different from receiving peer feedback on hard skills like writing.

Lessons learned
- Connecting the course to the programme's content was an important guiding principle. Tutors were recruited among the teaching staff, but some were not accustomed to this kind of soft skill education, making it harder for them to facilitate tutor meetings. Designing good assignments and accompanying instructions for tutors proved crucial.
- Students tended to think of BC as 'things they can't do/ skills they miss', like learning Excel or presenting. This had to be addressed multiple times.
- Tutor meetings were valued, as students learn a lot when they collectively reflect on BC&PL issues. Discussing and sharing issues resulted in a much richer outcome than individual reflection assignments. A combination of individual assignments and tutor meetings is the preferred option.
- Organisational issues were encountered, as a longitudinal course is not supported by the Wageningen University educational systems. We faced struggles related to scheduling, assessment, and recognition of efforts put in the course by students and staff.
- Having a study advisor as a tutor was not compatible with their neutral and confidential role, as they had to assess their students.

Based on these experiences, the following recommendations can be made for other programmes considering implementing a similar course:
- Reflection on BC&PL skills is feasible at the start of a bachelor. Students appreciated the open discussions about developing these skills, and starting early provides them the opportunity to become aware of and start developing them.
- Designing assessment criteria collectively with students proved valuable for making the abstract concepts of BC&PL tangible and personal.
- A close and clear link to the study programme is needed. BC&PL should not be a separate part but clearly linked to the domain of a study programme to ensure a relevant learning experience.

Enhancing visibility and motivation for skills learning

Programme: **Bachelor Plant Sciences**
Contact: Lisa Nieuwboer
Skill Focus: Research Skills, Writing, Presenting, Collaboration, Reflection, Personal Leadership

Context
In the Bachelor Plant Sciences (BPW) programme, the skills covered in each course throughout the curriculum were mapped out, providing a clear overview of the skill progression. This mapping revealed that the core skills were already well-represented and that students were at the required level in their final year. The focus of the programme's larger Academic Journey project was therefore on improving the visibility of skills learning for students, enhancing alignment of existing skills instructions, and increasing student motivation for skills learning.

Approach
Several initiatives were implemented:

1. Developing professional profiles that included both knowledge and skills required for common graduate professions.
2. In the first course of the programme, students read these profiles, discover which skills they want/need to improve, and write a personal development plan for the first year. This plan is updated each year in subsequent courses.
3. Keeping assignments pragmatic and to-the-point, with guiding questions for reflection and the possibility for students to differentiate their learning journey.
4. Explaining what constitutes a good academic attitude and the importance of taking ownership of the learning process, without explicitly mentioning personal leadership or reflection. Students learn these skills by doing them.

Key results
The following activities and assignments were developed:

In 'Introduction Plant Sciences':
- Studying professional profiles in a 40-minute tutorial
- Writing a personal development plan for year 1 in a 40-minute tutorial

In 'Plant Sciences in Practice':
- Conducting 3 1-hour interviews with professionals
- Interview reflection assignment in a 40-minute tutorial
- Writing a personal development plan for year 2 in a 20-minute tutorial

In 'Research and Resilience in Plant Sciences' (work in progress):
- Writing a personal development plan for year 3, considering electives and BSc thesis planning
- In the BSc thesis (work in progress):
- Self-reflection assignment, writing personal thesis learning goals using the three personal development plans as input

All materials and assignments are part of the continuous 'BPW Academic Journey' Brightspace course, which students can also use as a portfolio.

Impact
Students appreciate the professional profiles and interview assignments, recognising the benefit of connecting their learning journey to their future career. After the interviews, almost all students mention the importance of Data Science and their desire to improve their data analysis skills, even if they don't enjoy it. After writing the first personal development plan, some students approached their study adviser, having already confronted personal challenges during the self-reflection.

Lecturers value the overviews of skills in different courses, with details such as the type of assignment and whether or not the students receive central instruction. This helps them assess the expected skill level of students and tailor their instructions and assignments. They appreciate that their participation is voluntary, and no assignment changes are required. This is especially important in the first year, with large courses that are part of many programmes, as it is impossible to adjust to the skills learning trajectory of every individual programme

Lessons learned
- Successfully implementing the BPW Academic Journey required space for instruction/tutorials in at least 3 courses. The strong base of common courses with enthusiastic and collaborative teachers was a huge advantage.
- The less expected from other teachers, the easier they approach you and they are more willing to collaborate.
- Connecting skills learning to the professional field is effective for motivating students.
- Formative assessment (pass/fail) is preferred for reflections and personal development plans, as it is not possible to grade a personal story. Students receive a 'pass' for completing the assignment seriously.
- Managing and updating the BPW Academic Journey will be quite a lot of work, so having a dedicated skills coordinator who also gives some of the tutorials is advantageous and maybe even necessary.

Integrating a personal development path

Programme: **Bachelor Soil, Water, Atmosphere**
Contact: Antonija Rimac-van Heerwaarden and Arnold Moene
Skill Focus: All 16 skills

Context
The Bachelor Soil, Water, Atmosphere (BSW) programme introduced a Personal Development Path (PDP) to address several key issues hindering students' academic and professional growth. These included insufficient emphasis on the professional field, academic skills and scientific development, a lack of connection between research and its applications and societal relevance, difficulty grasping connections between courses, and inadequate reflection on skills and the role of Earth Sciences in society when selecting courses for their third year and MSc studies. The PDP was developed collaboratively by the Programme Committee, Pyrus study association, and former BSc students, assisted by TLC's 'Redesign lab'.

Approach
The PDP was designed with a central theme for each year: 'learn to learn' (year 1), 'learn to analyse' (year 2), and 'learn to research' (year 3). The aim was to gradually increase students' independence through a scaffolding approach, with the most support in year 1 and more focus on reflection and future planning in year 3.

The initial approach involved compulsory online assignments to stimulate reflection on skill development, with minimal presence of the teaching team. Based on student feedback, a revised approach was implemented, involving:
- Defining skills to be developed each year, closely connected to those taught in domain courses.
- Analysing existing course materials, collaborating with the Pyrus study association, and developing extra-curricular activities focused on skills.
- Guiding students in reflection and self-assessment using skills rubrics, organising reflection moments, and offering guidance.
- Collaborating with the programme director and study advisors in problematic situations.

Key results
The PDP now includes the following activities:
- A kick-off meeting where students explore skills, perform self-assessment, and choose skills to develop.
- A learning goals workshop where students create learning goals and plan how to achieve them.
- A meeting in year 1 and 2 with study advisors focused on reflection and seeking guidance.
- At least three additional progress meetings with the course coordinator to discuss progress and provide peer support.

Impact
The revised PDP has had a positive impact as students feel better prepared and find the course well-organised, structured, and clear. They appreciate email reminders and contact with the course coordinator. The impact on student development remains to be seen.

Lessons learned
While the organisational aspects of the initial PDP were functional, its structure and relevance to students' personal growth could be improved. Lessons learned from the first iterations of the course included the need for clearer learning goals, a more personalised, flexible approach with optional activities, and better integration of assignments. Challenges included students' difficulty adopting different perspectives, underscoring the need for explicit instruction in developing skills and attitudes.

Key takeaways and advice for others:
- Link skill development to other ongoing projects within the study programme and university.
- Facilitate connections between colleagues with relevant expertise.
- Consider the perspectives of various stakeholders when assessing activities.
- Be innovative and original. Don't be afraid to make mistakes and start over.
- Start small, incorporate student feedback, and continuously adjust based on experiences.

Concluding remarks

Bridge Vision and Practice in Skills Education
The transition from an inspiring vision to a realistic practice in daily education is a common challenge in higher education. This applies not only to translating policy into practice, but also to developing supportive guidelines that truly benefit educational professionals. Reflecting on the Skills Project, we have identified several success factors that proved effective at both the programme level and the university level. These insights form a solid foundation for future initiatives and underscore the importance of collaborative approaches in navigating this complex process. Additionally, the lessons learned from the project emphasise the crucial role of consistent communication, concrete outcomes, and continuous support in integrating skills education into the curriculum. These lessons continue to guide the ongoing development and refinement of skills learning trajectories at WUR.

Adapt Skills Education to a Changing World
Education evolves alongside society and the shifting demands of the labour market. Rapid societal, environmental, and technological changes continuously reshape professional requirements. Issues such as climate change, globalisation, and the rise of artificial intelligence demand that students acquire new skills to remain relevant. The current set of sixteen generic skills should not be viewed as static; it must evolve in response to societal developments. As new skills become essential, others may fade in relevance, emphasising the need for ongoing evaluation and adaptation of educational goals. Whether preparing students to engage critically with emerging technologies or equipping them to address complex social and environmental issues, education must remain dynamic and future-oriented.

Shape the Future of Skills Education
The Skill Up Festival was organised to celebrate the project's achievements and share its outcomes with a broad audience. It also provided an opportunity to look ahead, with participants invited to contribute to a "wishing tree" under the theme: Dreams of the future of higher education: How can we empower responsible change makers?

The feedback focused on the need for transformative learning environments that connect students with real-world challenges and provide coherence across their studies. Innovative teaching methods, such as nature-based learning and a shift away from traditional grading, were also highlighted as ways to foster deeper engagement and ethical reflection. Many emphasised the importance of empowering students as active partners in their education, ensuring they have a voice in defining what it means to be a responsible change maker. (For a complete list of ideas shared during the festival, see the appendix III.)

Define the Path Forward for Skills Education
This project provides a solid foundation for the continued evolution of skills education. By fostering adaptability and empowering students to actively engage with and respond to change, we can build an education system that not only addresses today's challenges but also prepares students to navigate and shape the future. This approach will ensure that education remains relevant, resilient, and capable of cultivating responsible change makers for tomorrow’s world.

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Colophon

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References

1. Wageningen University & Research's Vision for Education, 2017 [link]
2. Strategische agenda hoger onderwijs en onderzoek, OCW, 2019 [link]
3. Wageningen University & Research's Vision for Education, 2025
4. Skills Templates & Tools [link]
5. BSc Skills Learning Outcomes [link]
6. Guideline for the design and implementation of skills learning trajectories [link]
7. Boundary Crossing project [link]
8. Set of sixteen BSc skills & programme specific skills [link]
9. Education Support: Society Based Education (Real Life Learning) [link]
10. Education assessment policy Wageningen University, 2023 [link]

Appendix I

Governance

The governance of the project was based on a service-oriented and participatory implementation process. Stakeholders collaborated to make sure the results were beneficial for all.

Project team
To ensure the successful execution of this project, WUR appointed a project leader and a project team. The project team provided hands-on assistance to the programmes in designing and implementing skills learning trajectories. This group included the project leader and educational experts and collaborated closely with several departments, such as Education and Learning Sciences (ELS) and Teaching and Learning Centre (TLC). The project leader reported monthly to the steering group. The project team worked closely with programme staff, teachers, and support units to create tailored solutions that aligned with the unique needs and context of each programme.

Steering group
The steering group consisted of the Dean of Education (chair), a policy advisor, the head of the Teaching and Learning Centre, two or three representatives of programmes (programme directors or skills coordinators) and the project leader (secretary). The steering group monitored developments, challenges, and initiatives related to the implementation of skills learning trajectories in the BSc programmes, playing an advisory, connective, and supportive role. When issues raised from the organisation regarding the implementation of skills learning trajectories, the steering group made decisions in line with established frameworks. Additionally, the steering group advised the Board of Education when the current frameworks do not provide sufficient guidance or flexibility.

Programme committees
Programme Committees, consisting of both staff and student representatives, ensured that the skills aligned with the educational goals and needs of their specific programme. They are responsible for the curriculum development process. Thus it is the programme committees who decide which skills deserve a prominent place in the programme. They also oversee the embedding of skills in courses. Throughout this process, the Programme Committees also organised staff meetings to facilitate communication and collaboration among teachers, ensuring that everyone was informed and engaged in the implementation process

Programme directors
Programme Directors provided strategic leadership and designed the implementation of the skills learning trajectories, in line with the overall vision and objectives of the university. They worked closely with the Programme Committees to support the integration process, provide resources, and facilitate collaboration with teachers and other stakeholders. Together, they maintained ownership of the implementation, ensuring that the skills were not only integrated but also visible present for students.

Skills community
During the project a skills community a Skills Community was developed. This community included employees that had an interest in skills education. This community was crucial in supporting the implementation of skills learning trajectories. The community worked together by sharing practices, teaching methods, learning materials, and tools for feedback and assessment with one another. Educational experts and skills teachers from ELS (the chairgroup education and learning sciences) contributed to this community by helping to define the skills learning outcomes, ensuring alignment with the university-wide framework while allowing programmes to tailor skills to their specific needs.

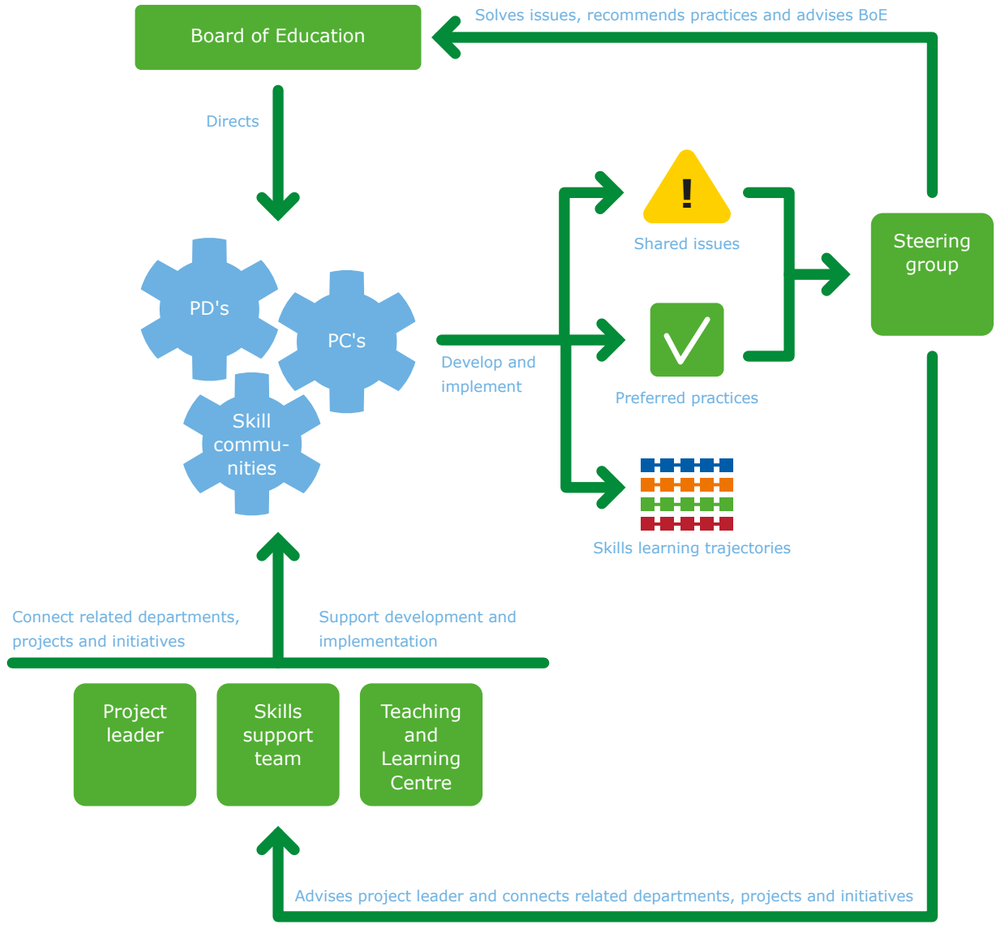

Figure 3. Overview of the governance structure of the Skills Learning Trajectories Project.

Appendix II

Advice for the structure and implementation of the role: coordinator skills learning trajectories

Rationale and necessity of the role
The BSc skills project will be delivered by December 2024. All 20 BSc programmes have the assignment to implement learning trajectories for sixteen defined skills. The BSc skills project supports, facilitates, and enhances this process.

In the period leading up to this, extensive groundwork has been laid to embed these skills within the curricula of each programme. To ensure that programmes and teachers can continue improving skills learning trajectories in their curricula and courses, and to maintain the benefits of the established coherence and recognisability within WUR, it is essential to develop an approach to skills coordination within and between programmes. This will create clarity for support staff, programme committees, teachers and students, ensuring the continued embedding after December 2024.

WUR's new educational vision emphasises the formative role of the university in educating responsible change makers for science and society. This means that WUR not only aims to impart knowledge, but also to support students in developing crucial skills for their future professional and personal development. A structural role in coordinating curriculum development and embedding skills learning trajectories ensures a sustainable and coherent integration of these skills into the curriculum, ultimately enhancing the quality and effectiveness of education. This role secures the integration of learning trajectories and curriculum development within the BSc programmes, ensuring that both teachers and students are optimally facilitated. Now that teachers are increasingly required to collaborate across programmes and are expected to work more holistically without increasing their administrative workload, it is important to introduce more coordination in this regard. The need for a structural role in coordinating curriculum development and integrating skills learning trajectories is underscored by successful implementation in programmes where this has been done during the project's duration.

Description of tasks and role
The Coordinator Skills Learning Trajectories fulfills a crucial role within a BSc programme, focusing on curriculum development integrating skills learning trajectories. This role requires a blend of coordinating and operational tasks, involving close collaboration with the Programme Director, the Programme Committee (PC), teachers, study advisors, and other stakeholders to ensure and enhance the quality and consistency of skills learning trajectories interdisciplinary and transdisciplinary.

Tasks and responsibilities
1. Strategic integration of skills within the curriculum
- Developing strategic plans for integrating skills throughout the curriculum in collaboration with the PC and programme director.
- Coordinating and structuring skills across different academic years and courses.
- Aligning instruction and assessment of skills education.
- Creating skills overviews and making skills learning trajectories visible within the curriculum for teachers and students

2. Organisation of collaboration and alignment with and among teachers and skills experts
- Keeping track of the skills learning trajectories
- Actively engaging with course coordinators and teachers to embed skills learning objectives into instructional activities and materials.
- Facilitating meetings and workshops with teachers to promote cohesion and consistency in skills education in the curriculum.
- Collaborating with other skills coordinators to share knowledge and practice.
- Cultivating a culture of continuous improvement and innovation within skills education.

3. Educational activities
- Organising and facilitating a minimum number of sessions with students, focusing on educational activities for skills development.
- Developing and maintaining educational materials and resources, as well as collecting relevant materials to ensure the effectiveness of skills education.

4. Evaluation and quality assurance
- Gathering feedback from students, teachers and Programme Committee within the programme.
- Implementing improvement actions based on evaluation outcomes and shaping a comprehensive quality cycle.

Ideal candidate profile:
- Educational background: Completed relevant education at a minimum of master level, preferably with experience in educational development and skills education, and familiarity with the study programme is also desirable.
- Communication skills: Excellent communication (in Dutch and English) and collaboration skills to effectively interact with diverse stakeholders within the university.
- Analytical thinking: Attention to detail and analytical skills to analyse and enhance the quality of skills education.
- Proactive attitude: Hands-on mentality with a focus on implementing improvements and achieving measurable outcomes, along with the ability to persuade others to embrace change in skills education.
- Coaching experience: Possible experience as a study advisor, lecturer or similar role involving guiding and coaching students.

The Coordinator Skills Learning Trajectories plays an essential role in enhancing students' skills and ensuring educational quality within the bachelor's programme. Through strategic planning, close collaboration, and ongoing evaluation, this role contributes to an optimal learning environment for WUR's students.

Justification of hours
Based on a 38-hour workweek, a 0.25 FTE is allocated for a BSc programme to the role of Coordinator Skills Learning Trajectories, equivalent to 9.5 hours per week:

1. Strategic integration of skills (10%)
- Developing strategic plans for skills integration: 0.5 hour per week.
- Coordinating and structuring skills across different academic years: 0,5 hour per week.

2. Collaboration, evaluation, and quality assurance (40%)
- Active engagement with faculty for skills learning objectives integration: 2 hours per week.
- Facilitating meetings, workshops, and collaborating with other skills coordinators: 1 hour per week.
- Coordinating evaluations of skills education and collecting/analysing feedback: 1 hour per week.

3. Educational activities (50%)
- Organising and facilitating meetings with students and educational activities: 3 hours per week.
- Maintenance of educational materials: 1.5 hours per week.

Total hours per week: +/- 9,5 hours (0.25 FTE)

Appendix III

Skill Up Festival 2024: Dreams of the future of higher education. How can we empower responsible change makers?

Input from participants

Learning environment
- Rich experiential learning environments.
- Multiple moments that students experience/visit/work in field practices.

Learning trajectories
- Connect learning across courses.
- Consistency between courses – since all students/ graduates will be teachers of their own knowledge throughout their careers.

Teaching methods
- Use Self-Inquiry-Based-Learning as a model.
- By letting nature become a teacher again. Throughout history nature has taught people about balance, change, limits, growth, collaboration, hardship, values, health, language, image, music, art, technology, care, leadership – what not? Let's explore nature-based methods!
- Make use of nature-inclusive teaching & learning activities to learn and reflect on skills and attitudes.
- Less summative assessment, fewer grades.
- Don't underestimate students – let them aim high! (and so should we).
- Teach skills to process knowledge, analyse information, and form an opinion. Vocalise it. Reflect on it and have fun with it.
- Responsible > has to do with ethics.

Students as partners
- Give them opportunities to build their confidence on having real influence. Listen to them... (give them double counting votes).
- Figure out – with students – how they define this term (i.e. of responsible change maker). Tap into students' personal motivation, what they consider 'responsible'. What is relevant and motivational.
- Listen to one another.

Change?
- Learn together on how to change processes.
- I do not think all WUR students want to be a change maker. They want to contribute, but not everyone want change (and that's also fine > we need diversity).

Personal leadership and self-directedness
- Foster tenacity.
- By providing them the opportunity to discover what impact students want to create and what skills and competences they need to achieve that. And letting them develop the skills they need.
- Equip them with requisite skills, also personal attributes such as confidence and resilience.
- Decision-making is important for the change makders, to know when to act.
- Action competences are critical as well, appropriate actions coupled with the right attitudes can be very impactful for change making.
- Education as a way of development: whole-person, including not only mental, but emotional and soul-level. Including the fundamental questions of being human in this time of the world: what do we find important? What do we want to contribute to?
- Start with 'self-care-ability'.

Awareness of social and environmental context (world, nature): value based education ("Bildung")
- Continue to actively promote the importance of higher education and importance of treating the planet sustainably.
- Solidarity-based, socially-engaged education.
- Education underpinned by values that seek to serve humanity and share humanity goals first, such as kindness, compassion and empathy.

Continuation of the project
- Offering education to all, at all levels of skills. This could be done by implementing learnings from this project across all disciplines.
- Organise a market/symposium fot he BSc skills coordinators and the representatives of the skills, to engage in the implementation process.
- Keep on fighting to make/keep education (at least as) important as research! + implement skills.