

3.6

A Transferable Competency Portfolio Based on the Personal Development Process

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In education, a portfolio is a compilation of learning experiences that highlights a student's individual learning trajectory. As an assessment method, portfolios can emphasise the learning process and support the development of self-regulation. This chapter presents a developmental portfolio used in a project-based learning module for engineering students. Through its content, the portfolio supports the development of transferable competencies, while its structured process fosters self-regulation and other lifelong learning competencies, thus preparing students for lifelong learning. Results from different campuses and across bachelor years are presented, showing how students' portfolio outcomes developed over time, as well as how feedback practices influenced student engagement. Drawing on these findings and our experiences, we propose practical recommendations for educators, including strategies to incorporate the portfolio throughout the curriculum and to create clear expectations around feedback. In doing so, this chapter aims to inspire educators to adopt or adapt portfolio practices in ways that strengthen lifelong learning competency development in engineering education.

1 Introduction

A portfolio in the formal higher education context is a compilation of learning experiences and activities that highlights an individual's learning trajectory within this context (Alam et al., 2015; Chaudhuri & Cabau, 2017; Dujardin et al., 2024). Different types of portfolios exist, but some key features of portfolios as assessment methods are that they emphasize the individual learning process, increase the responsibility of students in their learning activities and learning process, and are used as a condensed version of learning that can be used for communication with educators and potential employees. Given these characteristics, portfolios align closely with the aims of Part 3 of this handbook, which showcases evidence-based examples of assessing competency development in engineering education.

This chapter presents an example of such a portfolio, aiming to inspire educators to either implement a portfolio or adapt an existing one to place greater emphasis on lifelong learning competencies or other competencies. First, the use of portfolios in higher education and specifically in engineering is described with special attention to the different types of portfolios (Section 2.1). This is followed by an illustration of how the lifelong learning competencies in this handbook are part of this portfolio. Next, our implementation of a portfolio is discussed, which is a portfolio focusing on transferable skills in a project-based learning module. Based on our use of this assessment method, we propose practical recommendations for implementation.

2 The use of portfolios

2.1 *Different types of portfolios in higher education*

Portfolios have long been established as a widely used educational tool in higher education, applied across a broad range of disciplines and contexts. Portfolios are used in higher education with different objectives. Alam et al. (2015) described four types of portfolios:

1. *Developmental portfolios* focus on the learning process, supporting students' ongoing growth through self-assessment, feedback, and reflection. The emphasis is on progress and skill development over time rather than the final product.
2. *Showcase portfolios* highlight the learning product, collecting evidence of achievement or mastery of competencies. These are often used to demonstrate skills to educators or potential employers, emphasizing the quality and completeness of the work.
3. *Assessment portfolios* are intended for formal evaluation, documenting student mastery of competencies against predefined standards or learning outcomes. The focus is on measuring performance rather than guiding learning.
4. *Institutional portfolios* serve to record and document achievements or non-academic activities, often for professional development planning or administrative purposes. They emphasize documentation and comprehensiveness rather than reflection or skill development.

2.2 The developmental portfolio

While all four types of portfolios are relevant to supporting lifelong learning and can be used for assessment, this chapter focuses on developmental portfolios (see references and further reading for examples of the other types; Bokhua et al. 2020; Clarke & Boud, 2026; Heeneman & Driessen, 2017). This choice is deliberate: developmental portfolios place students at the centre of their learning, actively involve them in the learning process, and encourage independent learning and reflection. By emphasising the process rather than just the product, developmental portfolios are particularly well-suited to support the cultivation of lifelong learning competencies. This does not mean that the educator is not a part of this process. Educators can play an important role in supporting the learning process to further increase learning gains by providing feedback (Hattie & Timperley, 2007) on the content, but also on the learning process itself. In practice, the portfolio is most beneficial when used as a formative assessment tool throughout a semester, allowing students to reflect, set goals, and receive feedback at multiple stages of their learning.

The developmental character of this portfolio is made explicit by structuring the portfolio around the personal development process (cited from Dujardin et al., 2024, p. 4; developed by Patel et al., 2013) as follows:

1. *Identifying gaps in competencies (skills, knowledge, and attitudes);*
2. *Prepare for learning by setting a (SMART) goal and identifying learning resources and opportunities;*
3. *Act on this plan;*
4. *Monitor the learning process;*
5. *Reflect on how the learning process can be improved and what the future learning needs are.*

This developmental portfolio is used to assess the lifelong learning competency self-regulation (see Chapter 2.15 of this handbook), rather than their mastery of individual competencies. Self-regulation is “*the self-directive process by which learners transform their mental abilities into academic skills*” (Zimmerman, 2002, p. 65).

In the model of Zimmerman (2000, 2002), self-regulation consists of three cyclical phases, namely the forethought phase, the performance phase, and the self-reflection phase. The forethought phase takes place before learning and refers to beliefs about the learner’s role in the learning process. During actual learning, in the performance phase, the learner must exercise self-control and self-observe to be aware of their learning process and enable improvement. Finally, in the self-reflection phase, the learning process is evaluated. These phases align closely with the personal development process implemented in our portfolio, outlined in the previous section.

The portfolio also aims to trigger the other lifelong learning competencies as defined by Van den Broeck et al. (2024):

1. *Autonomous motivation* (Chapter 2.17) means that learning is pursued because it is perceived to be enjoyable, but also because it is seen as useful. We aim to trigger this competency by communicating why the portfolio is useful and we

hope that students will experience its usefulness through their increased competency levels.

2. *Information literacy* (Chapter 2.16) can be triggered when students choose a concrete action that requires them to seek information about a specific competency, for example when they want to work on their ethical thinking skills by researching relevant topics.
3. *Initiative and perseverance* (Chapter 2.18) are required to successfully follow through with the portfolio and the learning process in practice.
4. *Learning beliefs* (Chapter 2.17) are included implicitly and will hopefully be influenced by helping students recognize their active role in learning, while learning strategies are triggered by asking them to choose their own approach to learning.
5. *Adaptability and resilience* (Chapter 2.15) are included implicitly and are necessary due to the longitudinal format of the portfolio.

3 Implementation and practical example

3.1 Context of the implementation

The portfolio discussed in this chapter was implemented in the curriculum of a three-year Engineering Technology bachelor programme at KU Leuven, Belgium. The faculty has multiple campuses which operate with a similar curriculum while allowing room for campus-specific implementations. The first trial of the portfolio was implemented and further developed in one campus in the context of an EU-funded Erasmus+ cooperation partnership called TRAINeng-PDP. Afterwards, a pilot in the first year of the bachelor programme was implemented at three more campuses.

The portfolio is implemented in a learning path called Engineering Experiences, which is a project-based, year-long module, systematically recurring in each year of the bachelor. These modules contain challenging and authentic assignments to integrate competencies acquired in other modules (e.g., designing an automatic window for a greenhouse), addressing both technical and professional skills. As the assignments increase in complexity, students expand their expertise through a mix of individual and group tasks that combine open and closed elements. The portfolio discussed in this chapter was implemented in a module with 110 students in the first bachelor year, 47 in the second bachelor year, and 44 in the third bachelor year. This decrease in cohort size is typical for the Belgian open-access higher education system, where relatively high first-year dropout rates reduce the number of students progressing to later years.

3.2 Content of the implementation

Students access the portfolio via their learning management system, in which it is implemented in two complementary digital forms: the portfolio itself and a self-assessment rubric. Both are outlined below.

The portfolio

The portfolio is built around the personal development process. At the start of the semester, students complete a self-assessment by filling in a rubric on transferable competencies and then defining a concrete action they will be taking that specific semester to improve one competency. During the semester, they report back by evaluating their progress and describing which steps they have taken. The portfolio focuses entirely on reflective entries and does not include additional artifacts or evidence. At the end of the semester, they complete a reflection in which they look back on the learning process and then look ahead to the next semester, which will involve a new portfolio and learning cycle. Over the course of the three-year bachelor programme, students repeat this process each semester, resulting in six iterations in total. The full content of the portfolio is included in Example 1.

Example 1. Portfolio context

Instructions — procedure

- *Fill in this form at the requested times during the semester.*
- *Follow the instructions as shown in each section. Tip: first write your answers in a separate document. This way, you won't lose valuable work if your browser crashes.*
- *When a section is completed, always send it to the instructor for feedback. You can find the name of your instructor at the top of the portfolio.*

We want to continuously improve the portfolio to better meet your needs as a student. Therefore, we ask for your permission to use the data from the portfolio for educational research purposes. More information can be found in the informed consent.

I agree

- ☐ Yes
- ☐ No

The personal development process

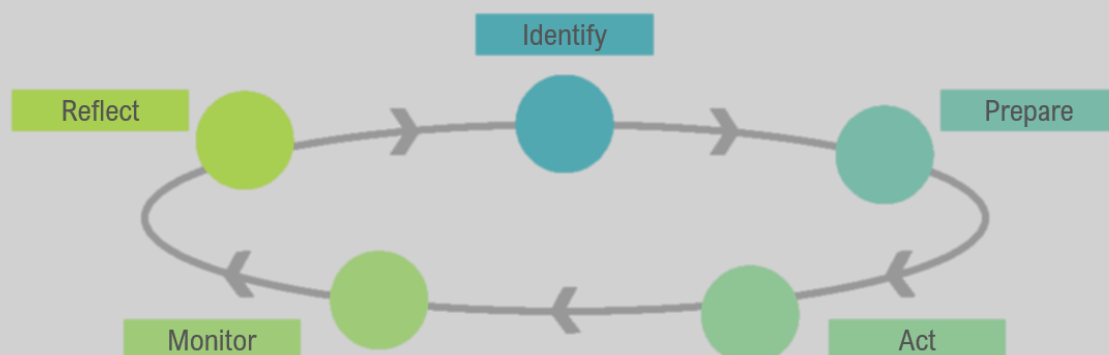


Figure 3.6.1: PDP process — Own work by Dujardin, 2023

Throughout this semester, you will go through the steps of the personal development process with the portfolio. We set deadlines for the different sections:

- 1. identify and prepare*
- 2. act and monitor*
- 3. reflect*

You can find the deadlines for each section at the top of this portfolio. To be on time, you must send the portfolio to the instructor for feedback.

Identify and Prepare

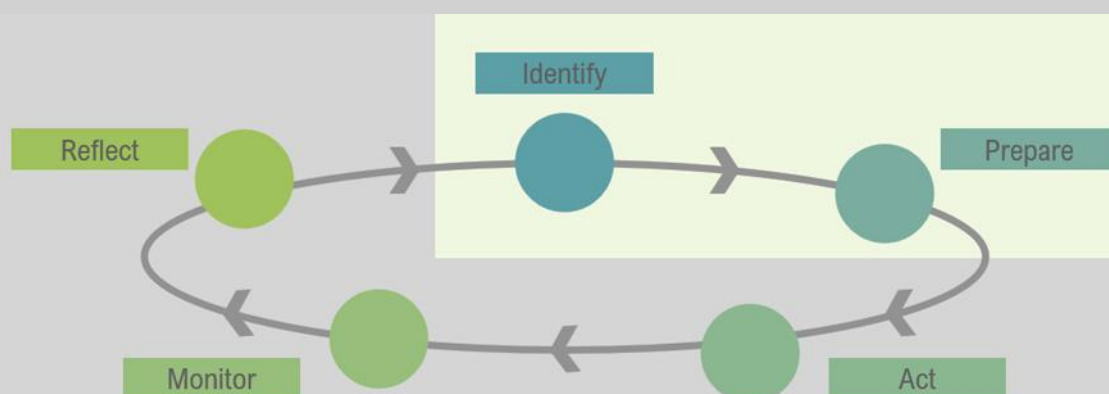


Figure 3.6.2: PDP process: identify and prepare — Own Work by Dujardin, 2023

In this section of the portfolio, you identify your strengths and weaknesses and create a plan to work on a chosen competency.

Go to the Professional Competencies Form to assess your proficiency in various competencies.

- You may not be familiar with some competencies. In this case, indicate the level you estimate to be most accurate.*
- If you think you fall between two levels, choose the lower level.*

Once you have filled in the rubrics, choose one competency to work on this semester. You don't have to choose the competency where you scored the lowest. You can also choose a competency that you value highly or one where you are already good and want to improve further.

Now create an action plan to work on this competency this semester. Some tips for creating an action plan:

- clearly describe which competency you will work on, your current level, and the level you want to achieve.*
- formulate a concrete plan and avoid vague goals. Describe specifically what, where, when, and how you will tackle it.*

- *you have one semester to complete this plan. Make sure it is realistic. You don't have to become an expert all at once. A small change can have a big impact.*

You now have the entire semester to execute your action plan. During the semester, you have to fill in the portfolio at two moments of their own choice. Send the portfolio to the instructor for feedback.

Act and Monitor

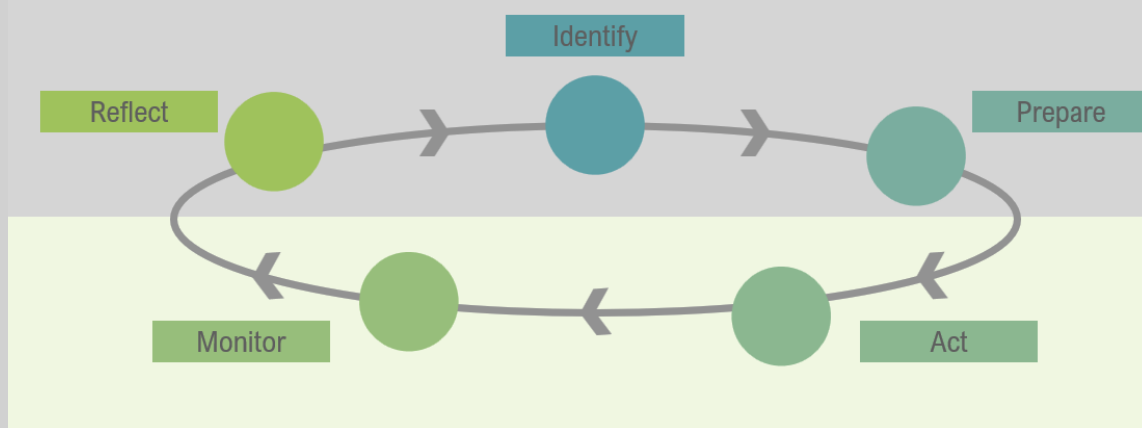


Figure 3.6.3: PDP process: Act and monitor – Own work by Dujardin, 2023

Fill in this section during the semester to track your progress. At two moments during the semester, you will have to answer the questions below.

- *For the first question, evaluate whether you have come closer to your goal. It's okay if you don't make progress at some point or even experience setbacks.*
- *For the second question, explain what actions you have taken to improve in this competency. Be specific. What did you try in which context, and what was the result?*

Send the portfolio to the instructor for feedback.

Moment 1

What progress have you noticed in your competency level for the chosen competency?

- ☐ *Significant decline*
- ☐ *Some decline*
- ☐ *No progress or decline*
- ☐ *Some progress*
- ☐ *Significant progress*

What specific actions have you taken to improve in your competency?

Moment 2

What progress have you noticed in your competency level for the chosen competency since the previous moment?

- ☐ Significant decline
- ☐ Some decline
- ☐ No progress or decline
- ☐ Some progress
- ☐ Significant progress

What specific actions have you taken to improve in your competency?

Reflect

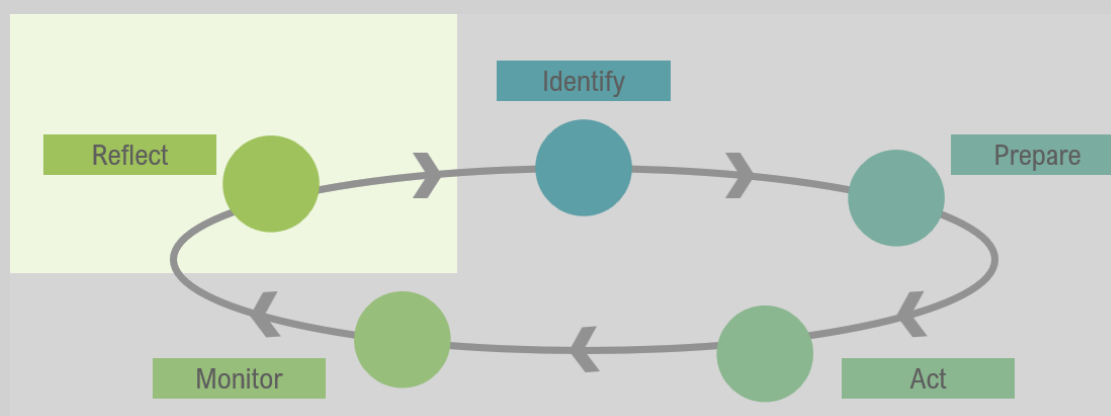


Figure 3.6.4: PDP process: Reflect — Own Work by Dujardin, 2023

This is the last section of the portfolio for this semester.

First, reflect on your learning process from the past semester.

- *Have you improved in your chosen competency? How do you notice this?*
- *Was your action plan a good plan? Did you make any adjustments?*
- *Are there other things you have learned about yourself, the learning process, or the competency?*

Next semester, you will create a new portfolio. Reflect on how you will approach it.

- *Are there other competencies you want to work on? Which ones and why?*
- *Will you approach it the same way?*

- *Are there other lessons from this semester that you will take into the portfolio for next semester?*

Send the portfolio to the instructor for feedback.

Table 3.6.1: Transferable competencies in the 'identify' rubric

<i>Competency</i>	<i>Indicator</i>
Lifelong learning	Self-regulation Motivation Information literacy Flexibility Learning strategies Perseverance
Reflection	Self-reflection Ethical thinking Critical thinking
Written communication	Correctness Targeting the right audience Structure Scientific writing
Presentation skills	Language use Clarity Targeting the right audience Speaking skills
Working with others	Leadership Contribution to teamwork responsibility
Stress resistance	Study stress Presentation stress Social stress
Innovative thinking	Problem solving Creative thinking Entrepreneurial thinking
Management	Project management Time management

The rubrics

In the 'identify' phase, the first phase of the portfolio, students use a form to assess their transferable competencies on four levels (1) beginner; (2) growing; (3) mastering; and (4) expert. These rubrics were developed using guidelines from our faculty, existing rubrics from other modules, as well as theoretical and empirical work on specific competencies.

To assist the students in selecting a specific competency to work on, they assess themselves on eight competencies, with at least two indicators each. Students are explicitly encouraged to work not only on competencies they still need to develop, but also on those they enjoy, find useful, or wish to excel in.

An overview of the competencies and indicators can be found in Table 3.6.1. The full rubric can be consulted on the Open Science Framework (Dujardin et al., 2026).

Feedback and evaluation system

Students receive the portfolio assignment in the first or second week of the twelve-week semester. There are three deadlines throughout the semester. The first deadline is in week 3 for the 'identify' and 'prepare' sections of the portfolio. For the 'act' and 'monitor' sections, there is one official deadline in week 10, but students are required to submit two progress updates between weeks 3 and 10. Finally, the 'reflect' section is due by week 12.

Educators, including teaching assistants and lecturers, give feedback using a reflection rubric based on Coppens et al. (2023) and Kember et al. (2008) (see Table 3.6.2.) throughout the semester. On top of the rubric, educators have the opportunity to provide additional feedback, which is especially useful when students score a 0.75 (for the grading see Table 3.6.2.). In this case they clearly put effort into the portfolio but did not get the full score because of a very specific reason. Since it is not possible to include every possible reason, this is noted in the written feedback. For example, when a student suggests a good concrete action, which is not completely realistic for the semester, they get such feedback. When the students did not ask for feedback through the system, the portfolio was not visible for the educator, and the portfolio was labelled as an 'empty form'.

The evaluation of the portfolio was included as a small percentage of the total score for each of the three Engineering Experiences modules, ranging from 5% to 10% depending on the bachelor year. It is also important to emphasize that one student always receives feedback from the same educator during each semester. The feedback and evaluation system described above was developed and tested in one campus and later implemented in stages in other campuses of our multi-campus faculty.

Table 3.6.2: Feedback rubric

<i>Part of the portfolio</i>	<i>Rubric</i>	<i>Grade</i>
<i>Identify and prepare</i>	○ Not filled out (on time)	0
	○ Engagement, no action	0.25
	○ Action, but not specific enough	0.50
	○ Concrete action	0.75
	○ Excellent concrete action	1
<i>Act and monitor</i>	○ Not filled out (on time)	0
	○ Insufficiently concrete description of actions	0.25
	○ Concrete description of actions taken without context	0.50
	○ Clear actions taken within context	0.75
	○ Clear actions taken with critical reflection	1
<i>Reflect</i>	○ Not filled out (on time)	0
	○ No reflection, a superficial answer to the question	0.25
	○ Basic reflection: somewhat reflective, but still superficial	0.50
	○ Good reflection: thoughtful answers	0.75
	○ Critical reflection on all questions	1

Competency development

The portfolio aims to foster competency development at two interconnected levels. At the first level, students focus on developing transferable competencies by selecting one competency from the rubric (see Table 3.6.1) to serve as the central focus of their portfolio. At the second level, students cultivate lifelong learning competencies (as outlined in Section 3) through engagement in an active, student-centred learning process. Because evaluation and feedback emphasise goal setting, process monitoring, and reflection, assessment primarily targets students' development of lifelong learning competencies.

In the feedback process it is important to note that students' self-regulation competencies are assessed, not the extent to which they master a competency. For example, in the 'reflect' part, a student with a critical reflection about why their leadership competency did not improve will get a higher grade than a student with a superficial description that shows their competency level in fact increased.

3.3 Results and outcomes

The following section contains data from the portfolios of the academic year 2023-2024. Firstly, we compare the different bachelor years of Campus A with a focus on their grades and the competencies they chose for their portfolio. Then, the grades of students in Campus A are compared to the grades of the students on a second campus (Campus B) to get insight into how the feedback and evaluation influenced students' performance.

Bachelor years

Table 3.6.3. provides an overview of student performance on the different components of the portfolio across the bachelor years. The results show that a considerable number of students achieve scores at the highest end of the scale. Performance is strongest among students in the second and third year, with a larger proportion reaching the top category. For example, on the 'identify and prepare' component, 87% of second-year students and 83% of third-year students scored at the highest level, compared to 57% of first-year students. On the 'reflect' part of the portfolio, it is notable that many first-year bachelor students do not fill out this part of the portfolio (29%) or get the second-highest score (29%).

Table 3.6.3: Grades over bachelor years (note: the mode for each bachelor year is in bold.)

<i>Identify and prepare</i>	<i>Bachelor 1</i>	<i>Bachelor 2</i>	<i>Bachelor 3</i>
Engagement, no action	2%	0%	4%
Action, but not specific enough	20%	10%	11%
Concrete action	10%	0%	2%
Excellent concrete action	57%	87%	83%
Not filled out (on time)	10%	0%	0%
Empty form	0%	3%	0%

<i>Act and monitor</i>	<i>Bachelor 1</i>	<i>Bachelor 2</i>	<i>Bachelor 3</i>
Insufficiently concrete description of actions	4%	0%	7%
Concrete description of actions taken without context	14%	0%	9%
Clear actions taken within context	18%	18%	20%
Clear actions taken with critical reflection	33%	69%	59%
Not filled out (on time)	22%	8%	2%
Empty form	8%	5%	4%

<i>Reflect</i>	<i>Bachelor 1</i>	<i>Bachelor 2</i>	<i>Bachelor 3</i>
No reflection, a superficial answer to the question	0%	0%	0%
Basic reflection, somewhat reflective, but still superficial	10%	3%	4%
Good reflection, thoughtful answers	29%	18%	26%
Critical reflection on all questions	18%	69%	46%
Not filled out (on time)	14%	0%	2%
Empty form	29%	10%	22%

Complementary to these performance outcomes, we analysed students' self-selected competencies. Students seem to choose competencies which are the most useful for them at that time. Most first-year students (59%) choose lifelong learning competencies or the time management competency and apply this to their learning during the academic year. In the second and third bachelor year, lifelong learning competencies decrease as choices (36% and 22%), but the other transferable competencies become more popular. Second-year students mostly choose written communication (13%), stress management (21%), and presentation competencies (8%). Third-year bachelor students are notably more focused on the competency working with others (30%).

Table 3.6.4: Semester 1 and 2 grades for first-year bachelor students from campus A and B (note: the mode for each bachelor year from each campus during each semester is in bold.)

	<i>Campus A</i>		<i>Campus B</i>	
<i>Identify and prepare</i>	<i>Sem 1</i>	<i>Sem 2</i>	<i>Sem 1</i>	<i>Sem 2</i>
Engagement, no action	8%	1%	27%	6%
Action, but not specific enough	20%	6%	45%	36%
Concrete action	12%	6%	21%	17%
Excellent concrete action	57%	64%	6%	19%
Not filled out (on time)	0%	16%	0%	6%
Empty form	2%	6%	0%	17%
<i>Act and monitor</i>				
Insufficiently concrete description of actions	8%	1%	15%	3%
Concrete description of actions taken without context	20%	6%	24%	8%
Clear actions taken within context	24%	6%	24%	42%
Clear actions taken with critical reflection	39%	49%	6%	14%
Not filled out (on time)	0%	16%	0%	25%
Empty form	8%	21%	30%	30%
<i>Reflect</i>				
No reflection, a superficial answer to the question	4%	9%	21%	3%
Basic reflection, somewhat reflective, but still superficial	12%	18%	12%	14%
Good reflection, thoughtful answers	35%	16%	18%	17%
Critical reflection on all questions	20%	30%	9%	14%
Not filled out (on time)	0%	1%	0%	0%
Empty form	29%	25%	39%	42%

Impact of feedback and evaluation

Table 3.6.4. contains an overview of the grades of the first-year bachelor students on campus A and B in semesters 1 and 2. In semester 1, only the students on campus A received feedback on their work and were evaluated. In semester 2, the students from both campuses received feedback and were evaluated. For campus A there is a slightly positive trend in the grades from semester 1 to semester 2, indicating that the students got better in the assignments as part of the portfolio and developed more of the necessary reflective competencies. At campus B the students scored slightly better in the first 'identify and prepare' part but then scored much stronger after receiving feedback in the 'act and monitor' part. In the last part of the portfolio, 'reflect' the scores also increased, but the number of students not filling out the portfolio remains notable.

Taken together, these findings suggest that a developmental portfolio can effectively support the development of students' self-regulation and reflective competencies across different stages of the bachelor programme. The improvement in portfolio performance over time and after receiving structured feedback indicates that students progressively develop stronger goal setting, monitoring, and reflection practices. It is worth noting that a notable proportion of students, particularly in the first bachelor year, do not complete the portfolio, especially in later stages of the semester. Furthermore, the evolving patterns in competency selection across bachelor years suggest that students increasingly align their learning focus with the developmental demands of their academic trajectory. This supports the assumption that portfolio-based learning can foster both lifelong learning competencies and contextually meaningful transferable skill development.

4 Recommendations for implementation

To conclude this chapter, we present recommendations informed by our approach to the developmental portfolio for fostering lifelong learning competencies, as well as by our experience with its implementation.

Make the learning process explicit. Although portfolios can be used to assess a wide range of competencies, we deliberately focused our assessment on lifelong learning competencies in order to make these processes visible and explicit for students. By foregrounding goal setting, action planning, process monitoring, and reflection, the portfolio helps students become more aware of how they learn and how they can continue to develop beyond individual modules. We believe that using a clear structure in the portfolio based on the five steps of the personal development process makes the learning process easier to keep track of and easier for the students to remember afterwards. We also used a visualisation in which the cycle of learning was clearly represented, highlighting how learning always continues.

Support reflection on self-selected competencies. Our findings show that students naturally select competencies that are most relevant to them at each stage of their programme. We recommend continuing to allow students this freedom of choice while providing structured opportunities for goal setting, process monitoring, and reflection.

This supports the development of lifelong learning competencies without restricting students' autonomy in selecting which skills to focus on.

Incorporate the portfolio throughout the curriculum. The portfolio has the most impact when it is consistently integrated across study years, rather than treated as a stand-alone assignment. The results show that students' focus on different competencies evolves over time; the first-year students often prioritise lifelong learning and time management, while students in later years shift towards stress management, communication, and teamwork. The portfolio scores also indicate clear growth from the first to the later bachelor years, with more students achieving the highest levels of performance, possibly due to practice with the portfolio exercises.

Differentiate portfolio focus across study years. Our results show that students' choice of competencies evolves as they progress through the programme. Educators might explicitly align portfolio expectations with these developmental needs, while still allowing room for personal choice. We applied this finding in the portfolio of another campus by asking students to choose between lifelong learning and writing competencies.

Use feedback systematically. The comparison across campuses indicates that structured feedback and evaluation help students improve their portfolio work, particularly in the 'act and monitor' and 'reflect' parts. At the same time, providing high-quality feedback on reflective writing can be time-intensive and challenging for educators. To ensure feasibility and consistency, we therefore recommend embedding feedback in a clear structure, supported by rubrics and exemplars, and allocating sufficient institutional time and support for this process (Beckers et al., 2016).

Allow informal and non-formal ways of learning. For many competencies, there are modules provided by the university. However, to really mimic learning in a professional career, we found it important to allow different types of learning. The concrete actions needed to be formulated according to the SMART formula but could also include trying out new techniques or learning from peers, for example. This way of learning allowed students to reflect on which learning strategy they wanted to use, which aligns more closely with how learning occurs in the professional context. There is often a specific time and a place for taking modules, but learning on the job and from colleagues can be equally valuable. In our portfolio, we found that most students opted for informal and non-formal learning, with students often relying on each other to provide feedback on their performance (e.g., presentation competencies) or to learn from each other (e.g., project management).

Encourage further strengthening students' strengths. Building on positive psychology (Anderson et al., 2024), we explicitly told students that they could work on the competencies they felt less confident about and needed to improve, but also on the competencies which they found to be interesting or fun or were already good at. We found that many students still opted to work on their self-perceived weaknesses, but some students did choose to work on their strengths, especially for the competencies 'leadership' and 'creative thinking'.

Describe clear expectations for competencies. In earlier versions of the portfolio, we used less extensive self-assessments, where students were given a competency (e.g. 'I am a teamplayer') and asked to respond using a Likert scale. This self-assessment was less useful because, as educators, we received little information about their perception of their competency level. Their point of reference for the competency was unclear: were they comparing themselves to other students, peers in general, their ideal selves, professionals, etc? Students might also differ in their understanding of a competency and what it means to be the highest level of a competency. Additionally, the students had to define a concrete action, but without the specific description of the competencies, this was harder to do. While it takes some time to develop a rubric, we do recommend this. We think that for transferable skills, our rubrics can be used or be adapted to fit the context.

Provide a safe space for sharing. Although engineering students are sometimes perceived as more rational and less emotional (Lönngren et al., 2023), the portfolio seemed to provide a context in which many felt comfortable reflecting on personal challenges and insecurities. Multiple students discussed topics such as loss of motivation, feelings of isolation, and disproportionate stress levels. The portfolio can be a safe space for them to work on these issues, and educators can advise them to contact student counselling services or seek help from friends or professionals.

Create clear expectations around feedback for educators. Providing feedback on portfolios, and specifically reflections, can be a challenge for educators both in terms of time investment and ensuring consistency and fairness across assessors (Beckers et al., 2016). For this reason, we optimized this process by using a feedback rubric with the option to give additional feedback. We recommend this approach because the rubric makes evaluating much easier and this approach is scalable to a larger number of students. Currently, we are trying out this method with students from another campus.

Taken together, these recommendations illustrate how portfolios can be implemented in ways that both respect the practical realities of teaching and foster competency development. By making the learning process explicit, integrating the portfolio throughout the curriculum, and creating clear expectations for both students and educators, portfolios become more than an assessment tool. They evolve into a structured learning environment that prepares students for the challenges of professional practice. While each institution and programme will need to adapt these ideas to its own context, our experiences suggest that a thoughtfully designed developmental portfolio can play a central role in cultivating lifelong learning competencies in engineering education.

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AI statement

During the preparation of this work, the authors used Microsoft Copilot in order to refine the language. After using this tool, the authors reviewed, edited, and made the content their own as needed. They take full responsibility for the content of the publication.

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