D3.4 FRAMEWORK FOR INNOVATIVE PEDAGOGICAL APPROACHES AND GOOD PRACTICES REPORT (3rd REPORT)

(11/12/2023)

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1 Introduction – Pedagogical framework – Task of the Future and Advanced Skills Academies (FASA) within the RUN-EU project

This report focuses on the pedagogical framework which was designed during the years 2021-2023 in WP3 Future and Advanced Skills Academies (FASA) and its deliverable D3.4 Mapping the best pedagogical practices under the RUN-EU project. The pedagogical framework serves as a pedagogic backdrop for innovative pedagogical approaches and good practices implemented in all educational formats, such as Short Advanced Programmes (SAPs) and degree programmes in RUN EU. The framework was created to promote new and open flexible programmes using any current and new pedagogical approaches including blended learning, design thinking, phenomenon- and challenge-based curricula, among others.

This is the third of the three digital reports. All three reports aim to develop a framework for pedagogical design and delivery of innovative educational methods, give suggestions for effective pedagogical approaches for curricula design and delivery; make recommendations for improving current pedagogical practices. In total, the three reports aimed to ask the opinions of a minimum of 40 teachers and 120 students from each partner university.

The first report concerned teachers' perceptions of best pedagogical practices. The second focused on students' perceptions of the best pedagogical practices. This third and final report combines perspectives from both teachers and students and presents the results of an online survey regarding teaching and learning processes. Taken together, these three reports form the final pedagogical framework and good pedagogical practices that are included and discussed in the present document.

For this third report, online survey data from each institution in RUN-EU was gathered to mapping the best pedagogical practices currently in use in each partner institute. Results will further develop pedagogical approaches to curricula design and delivery. The survey addressed the teaching and learning processes of the teachers and students in eight partner higher education institutions: Polytechnic of Leiria (Portugal); Polytechnic of Cavado and Ave (Portugal); Technological University of the Shannon: Midlands Midwest (Ireland); NHL Stenden (the Netherlands); Széchenyi István University (Hungary); Häme University of Applied Sciences (Finland); Vorarlberg University of Applied Sciences (Austria). Data was collected from 155 teachers and 550 students. The aim of the survey was to broaden our understanding of the relationships between teaching and learning processes and the wellbeing of both students and teachers. We wanted to uncover the specific developmental needs concerning high quality learning and teaching in the RUN-EU institutions. This report aims to: present the 2023 survey results; discuss the framework for innovative pedagogical approaches and good practices drawing on the previous studies completed by the RUN-EU Future Skills Academies (FASA) plus

the relevant research literature; make recommendations on how to support quality learning and teaching in RUN-EU.

1.1   Purpose of the pedagogical framework

The pedagogical framework enables us, the FASA to identify, promote and develop new future and advanced skills programmes for students thus providing them with immersive learning experiences containing the most up to date knowledge and skills in cutting edge areas. Using the pedagogical framework, the FASA can then inform the work of WP6 and WP7. For instance. The pedagogical framework can not only help in the pedagogical design of Short-Advanced Programmes (WP6) and the European double and joint degrees (WP7, but also guide assessment procedures when evaluating educational initiatives offered by RUN-EU for quality and relevance.

The pedagogical framework forms the basis for the targets of WP3. These are as follows.
1. Create one central FASA and 8 institutional FASAs
2. Conduct desk research
3. Identify good pedagogic practices
4. Survey 320 teachers and 960 students
5. Organise five Continuous Development Advanced Programmes involving 72 teachers
6. Organise two Design Factory Bootcamps involving 48 teachers
7. Organise two Design Factory Workshops involving 160 students

The outcomes for WP3 are as follows.
1. Regular publication of RUN-EU skills bulletins
2. Produce a framework for innovative pedagogical approaches and good practices
3. Produce a catalogue of short courses for teachers' continuous development
4. Create Design Factory Bootcamps for teachers and Design Factory Workshops for students.

The operating principles of the FASA are provided in Figure 1 below.

Inputs

Outputs of European Innovation Hubs

Interaction with Regional Stakeholders and Advisory Boards

Societal and labour market requirements/ Skills Bulletins

Transnational curricula development teams

International innovations and best practices

Future and Advanced Skills Academies

Course development and delivery

Innovative pedagogical approaches and assessment methodologies

Assessment of quality and relevance of RUN-EU Programmes

Operating across the regional university at both a central and institutional level thus promoting integration

Outcomes

Student Centered Curricula

Flexible Pathways designed for reskilling, upskilling and Life Long Learning

Transdisciplinary and transnational curricula focused on emerging challenges and societal issues

SAP's and Collaborative European Degrees

Innovative pedagogies promoting excellence in education and research

Challenge and work-based learning

Development of digital and other innovative platforms

Target group: Young and adult, full-time, part-time, flexible and life-long learners

Figure 1. The operating principles of the FASA

To reiterate, the pedagogical framework included here draws on relevant higher education (HE) research plus results from yearly surveys on learning, teaching and wellbeing in RUN EU institutions. In total we aimed to ask 40 teachers and 120 students from each partner institution and this document reports results from the final third survey from 155 teachers and 550 students. It is important to highlight that the framework has been and will be updated continuously to accommodate new insights from ongoing RUN EU research and evaluation of pedagogical approaches to curricula design and delivery.

The aim of creating the framework for pedagogical approaches is that all the educational courses and initiatives within RUN-EU such as SAPs or joint programmes etc., be guided by a single overreaching set of pedagogic principles. This may in turn, help ensure standardization of education for all students and teachers across the RUN EU partner institutions.

1.2 Study aims

As mentioned above, this report presents the survey results which shed light on the connections between teaching and learning processes and the wellbeing of both students and teachers. In the context of higher education, high quality learning has often been defined through the concept of approaches to learning (Entwistle, 1998; Lindblom-Ylänne, Parpala & Postareff, 2019). Approaches to learning refer to the learning processes students apply when studying. Approaches to learning have been found to be related to students' study achievement as well as wellbeing (Asikainen et al., 2022). Approaches to learning may be regarded as context-specific and they have also been found to be related to the teaching practices that are used (Postareff et al., 2015). On the other hand, approaches to teaching are often used as a framework to study higher education teachers' teaching practices. In the present study, approaches to teaching are understood as the teaching intentions, methods, and strategies that the teachers apply in their lectures (Uiboleht et al., 2018; Murphy et al., 2021).

Even though there is evidence that teachers' approaches to teaching are related to their self-efficacy (Cao et al., 2018; Kaye & Brewer, 2013), relatively little is known about the relationship between higher education teachers' wellbeing and teaching. Furthermore, only a few studies have focused on exploring the link between teaching and students' approaches to learning (Trigwell, et al., 1999; Uiboleht et al., 2018). Fairly little is known about how teaching and student learning are related and whether there is a relation between teachers' and students' wellbeing. The present study explores students' learning approaches and teachers' teaching approaches, more specifically the relationship between preferred approaches and wellbeing and whether students' and teachers' wellbeing are connected in any way.

The research questions are as follows.
1. What approaches to teaching do teachers apply in their teaching?
    a. How are the approaches to teaching related to different background variables (discipline/field of study, teaching experience, formal qualification in teaching)
    b. How are the approaches to teaching related to teachers' wellbeing?
2. What approaches to learning do students apply within the selected disciplines?
    c. How are the approaches to learning related to different background variables (discipline, age, study year)
    d. How are the approaches to learning related to students' experienced wellbeing?
3. What are the interrelations between teachers' approaches to teaching, students' approaches to learning and wellbeing?
    e. Are there differences between disciplines and institutions?

2 Theoretical framework

In recent years in the field of higher education (HE) pedagogy, there has been a growing interest regarding the wellbeing of the HE community plus high-quality learning and how these two issues can be promoted through teaching. In the literature, there are relevant avenues of research that focus on approaches to teaching, approaches to learning and the wellbeing of both students and teachers. In the study contained in this report, wellbeing is addressed as self-compassion and self-efficacy as its psychological dimensions. In the next chapter these concepts, constructs and pedagogical perspectives are explored in more detail through theoretical viewpoints and empirical evidence.

2.1 Approaches to learning

The learning and studying processes that take place in HE have been of continuous interest for scholars in the educational sciences. One way to explore students' learning and studying processes in HE, is students' approaches to learning (Asikainen & Gijbels, 2017). Approaches to learning was originally introduced by Marton and Säljö (1976) who first conceptualised the distinction between deep and surface approaches to learning. In their study, they asked 30 university students to read an academic article and prepare themselves to answer a few questions afterwards. The students' descriptions of how they studied the article indicated qualitative differences which were initially termed "levels of processing". Some students used a surface-level learning process to focus on the text itself, remember the content and reproduce the information in the same form as it was presented to them. Other students used a deep-level processing method and aimed to understand the article as a whole, focusing on the meaning and purpose of the text and aiming to reflect on what the author was trying to convey. The phrase "levels of processing" was first specifically meant for the context of studying an academic article, but the concept "approach" would later refer to students' everyday studying and learning in other contexts as well. Since Marton and Säljö's (1976) study, approaches to learning have been traditionally divided into the deep approach to learning and surface approach to learning (Asikainen & Gijbels, 2017).

Deep approach to learning emphasizes trying to understand the material and apply critical thinking when studying (Asikainen & Gijbels, 2017). It refers to engaging in meaningful learning and using learning strategies that are suitable for meaningful learning (Asikainen & Katajavuori, 2020). In the deep approach to learning students aim to integrating new ideas into their existing knowledge-base and carry out the learning tasks in a reflective way (Biggs, 2003). Research suggests that a deep approach to learning is related to better learning outcomes (Watters & Watters, 2007; Entwistle & Ramsden, 1983), as it encourages deeper-level learning processes (Entwistle & Ramsden, 1983). It should be highlighted however, that academic success in HE and good learning outcomes do not necessarily mean the same thing. This is because assessment measures in HE do not always measure deep learning (Asikainen et al., 2013). Instead,

assessment might focus on measuring factual knowledge. This can help explain Lizzio at al.'s (2002) findings that a surface approach to learning often results in academic success.

A surface approach to learning relates to students' efforts to simply memorize the new information based on extrinsic motives in relation to the learning task such as a fear of failure or prioritizing the grade over understanding (Vanthournout et al., 2014). Students who are inclined to use surface approaches may not focus on actually understanding the material. This in turn, leads to acquiring fragmented knowledge structures (Marton & Säljö, 1976). Students mostly reproduce facts that they have memorized for an exam, for instance, and in doing so, do not engage in adequate reflection (Entwistle, 1998). Research has shown that the surface approach to learning is associated with lower-level learning outcomes as well as the experience of having heavier workloads in comparison to the deep approach (Trigwell et al., 2012; Kyndt et al., 2011). Moreover, students who utilize a surface approach tend to have more negative perceptions of the teaching-learning environment such as the quality of teaching and approach to teaching (Kyndt et al., 2011; Trigwell et al., 2012).

However, it should be noted that the apparent dichotomy of the surface and deep approaches to learning is not necessarily a straightforward one. Some studies suggest that approaches to learning are context specific and can vary across different learning environments (Postareff et al., 2015; Baeten et al., 2010). Likewise, Parpala et al. (2020) found preliminary evidence of a dissonant profile in learners, which was characterized by atypical learning approach combinations that were theoretically conflicting. Students might use both deep and surface approaches to learning which might reflect a strategic approach to studying whereby they apply different approaches to learning according to different learning tasks (ibid.). Conversely, other researchers have argued that approaches to learning can be rather stable and consistent across various learning contexts (Lietz & Matthews, 2010; Zeegers, 2001). According to Entwistle and Ramsden (1983), the perceived stability of approaches to learning is likely explained by habit that is, that students in HE become accustomed to approaching a learning task in a certain way.

Since Marton and Säljö's (1976) study, a third, strategic approach has also been identified which is termed 'organized studying' (Entwistle & Ramsden, 1983; Entwistle et al., 2001). This refers to how organized students are in terms of their studies, learning and time management (Entwistle & McCune, 2004). Students who are organized in their study plan, study systematically, complete courses on time and are aware of the demands and necessary recourses for completing them (Salmisto et al., 2017). However, as organized studying refers to the ways in which students plan and organize their learning (Biggs, 2001; Lonka et al., 2004), it describes the students' approach to studying rather than approach to learning (Entwistle, 2009). Deep and surface approaches to learning, on the other hand, describe how students specifically deal with the learning tasks (Lonka et al., 2004). It has also been suggested that organized studying might be more important to some disciplines than others. For instance, veterinary medicine is traditionally perceived to be more 'school-like' in the sense of having a pre-set timetabled study plan and course overload (Ruohoniemi & Lindblom-Ylänne, 2009). This in turn, requires the

students to be strategic and organized to enable them to complete the obligatory courses in a given time (Parpala et al., 2010). Interestingly, prior research has also shown that organized studying is also associated with a deep approach to learning (e.g., Parpala et al., 2010; Entwistle et al., 2000). Furthermore, in Rytkönen's (2012) study, organized studying was found to be more important for success in higher education studies in comparison to the deep approach to learning which is usually perceived to predict academic achievement.

Research has also illuminated the links between the psychological wellbeing of HE students and approaches to learning, plus other variables that are also of interest in the present study. There is evidence that students who utilize a deep approach to learning tend to have stronger self-efficacy beliefs as opposed to students who use a surface approach (e.g., Nieminen et al., 2021; Diseth, 2011; Prat-Sala & Redford, 2010). The surface approach to learning has been associated with other dimensions of psychological wellbeing, or rather, ill-being such as study-related burnout (Asikainen et al., 2022). Research has also shed light on disciplinary variation in terms of which learning approach HE students from different fields are more likely to use (e.g., Parpala et al., 2010; Smith & Miller, 2005; Entwistle & Ramsden, 1983). Humanities and social sciences students, that is, the 'soft' disciplines, are more likely to adopt a deep approach to learning. Parpala et al. (2010) suggest that this might be due to the production of knowledge and even means of communication which have some variation between different disciplines. For instance, in social and behavioural sciences internal motivation, critical thinking and intellectual growth is often emphasized. Natural science and applied science students are more inclined to adopt a surface approach (Parpala et al., 2010; Smith & Miller, 2005). However, Salmisto et al. (2017) found that among civil engineering students, a deep approach to learning was more common than surface approaches and organized learning.

2.3 Approaches to teaching

HE learning environments have changed dramatically during the past decades. One of the most notable changes can be seen around 'constructivist' and 'traditional' approaches to teaching (Uiboleht et al., 2018). A constructivist approach relates to supporting the engagement of students and their own knowledge construction while a traditional approach to teaching focuses on information delivery to the students (Tynjälä, 1999). However, there is some variation in terminology used concerning this dichotomy. A distinction is also made between two broad categories of student-centred and teacher-centred teaching (e.g., Murphy et al., 2021) with the former referring to a constructivist approach and the latter meaning traditional approaches to teaching (Uiboleht et al., 2018). Moreover, in some studies the terms content-centred that is traditional, teacher-centred approaches and learning-centred or constructivist, student-centred approaches have been adopted (e.g., Postareff & Lindblom-Ylänne, 2008; Uiboleht et al., 2018). Despite these differences in terminology, both approaches share the same general underlying principles and characteristics that relate to the perceptions of the teacher's role, teaching methods and strategies and the teacher's intentions.

In a teacher-centred approach students are perceived as more or less passive recipients of information (Postareff & Lindblom-Ylänne, 2011; Kember & Kwan, 2000). The teaching methods and strategies used often rely on teacher-led lecturing where students mostly work alone (Murphy et al., 2021) as the teacher does not aim to reinforce students' active engagement or active construction of their own knowledge (Trigwell & Prosser, 2004). The teacher has the primary control of the learning experience of students who tend to have very limited opportunities for collaboration and interaction with one another (Serin, 2018). The teachers tend to focus on the presentation of their subject matter as the teaching leans heavily on information transmission (Postareff & Lindblom-Ylänne, 2008). This leads to fairly one-sided interaction (Prosser & Trigwell, 2014). The teachers who use this approach, generally do not consider the students' experience or what they may bring to the teaching situation (Trigwell et al., 2005). Teacher-focused teaching often incorporates an inflexible use of assessment methods and teaching strategies which the teachers are familiar with. Put differently teachers repeatedly use the same and familiar methodologies in different contexts and learning situations (Postareff et al., 2023).

The student-centred approach to teaching is characterized as applying learning and teaching activities and strategies that allow the students to collaborate and communicate with one another (Murphy et al., 2021). Additionally, teachers who utilize student-centred strategies aim to ensure that the amount and quality of teacher-student interaction is adequate and dialogical in nature (Trigwell & Prosser, 2004). The teacher acts as a facilitator of the students' learning processes who aims to meet the students' learning needs and encourages the students to understand the subject matter (Postareff & Lindblom-Ylänne, 2008). Teachers tend to also focus and monitor the students' perceptions, engagement, and activity (Trigwell et al., 2005). Teachers use diverse teaching strategies and assessment methods in order to engage and encourage students to be active. Teachers aim to activate students' thinking, activate their prior knowledge in the construction of new knowledge. (Trigwell & Prosser, 2004). However, as in the teacher-centred approach, the teachers do see knowledge transmission as a necessary part of teaching but is not considered as sufficient on its own. The teacher challenges students' current ideas through problem-solving, discussion and asking questions as this can facilitate students' knowledge construction (Trigwell et al., 2005).

In addition to the apparent dichotomy discussed above, two other dimensions of approaches to teaching have been recognized; namely, the reflective approach (Postareff & Lindbom-Ylänne, 2008); an organized approach to teaching (Postareff & Lindbom-Ylänne, 2008; Uiboleht, 2019). A qualitative study by Postareff and Lindbom-Ylänne (2008) discovered that teachers' ability to reflect on their own teaching as well as the learning of students appeared as a central addition to the previously dichotomic dimensions of approaches to teaching. The reflective approach to teaching is referred to as pedagogical awareness both of which are linked to student-centred teaching strategies and methods (Postareff et al., 2023). Teachers who tend to reflect their own teaching, do so from the viewpoint of consequences of their teaching in terms of student

learning as they are developing their teaching towards a more student-centred approach (Postareff at al., 2008).

An equally important addition to the dimensions of approaches to teaching is the organized approach to teaching which was discovered by the interview studies of Postareff and Lindblom-Ylänne (2008) and Uiboleht (2019). According to their studies, the organised approach refers to teachers' ability to plan and organize their teaching. However, depending on whether a teacher-centred or student-centred approach is being adopted, organizing and planning can present itself in a positive or a more negative way (Postareff et al., 2023). For instance, teachers who utilize more teacher-centred teaching strategies and methods, an organized approach to teaching typically takes the form of making stricter lecture plans which stem from teachers' own interests and includes little time for interactivity (Postareff & Lindblom-Ylänne, 2008). Conversely, when a student-centred approach to teaching is being adopted, planning and organizing leads to being first well prepared and second planning to uncover students' prior knowledge and interests and taking them into consideration during teaching situations (Postareff et al., 2023).

The literature seems to suggest that teacher-centred and student-centred approaches to teaching are mutually exclusive and that their relationship is dichotomic (e.g., Murphy et al., 2021; Trigwell & Prosser, 2004; Trigwell 2009). However, there is some evidence of a dissonant teacher profile, which is characterised as systematically using a combination of both approaches (e.g., Uiboleht et al., 2018, 2019; Postareff & Lindblom-Ylänne, 2011). In a similar vein, Postareff and Lindblom-Ylänne (2008) argue against the traditional 'either/or' positioning and suggest that the approaches to teaching should be understood as a continuum instead. From this view, a teacher-centred approach can be understood as a less complete strategy to teaching, one which can be developed through pedagogical training plus teaching experience (Postareff et al., 2007). Gibbs and Coffrey (2004) found that newly appointed, inexperienced teachers without any form of pedagogical training, reported higher levels of teacher-centeredness and lower use of student-centred strategies after a one-year follow-up period. Conversely, the teachers who participated in pedagogical training reported statistically significantly higher levels of student-centred teaching strategies after the one-year mark.

It is important to consider different approaches to teaching because research indicates that a student-centred approach is associated with deep learning strategies and high-quality learning outcomes while a teacher-centred approach is associated with the surface approach to learning (e.g., Trigwell et al., 1999; Entwistle & Ramsden, 1983; Trigwell et al., 1998). Moreover, Wilson and Fowler (2005) found that students who tend to generally adopt a surface learning approach are more likely to utilize deeper learning strategies when the teacher is more focused on students and their engagement. However, the evidence concerning the relationship between the approach to teaching and learning seems to be inconsistent: in some studies, a student-centred approach to teaching increased the likelihood that students would apply more surface-oriented learning strategies (e.g., Baeten et al., 2010; Gijbels, Segers, & Struyf, 2008). Indeed,

Baeten et al. (2010) suggest that this might be due to various contextual factors, such as the discipline in question and various institutional characteristics as well as the demographic factors of the students, including age and preferences for specific teaching methods.

In the present study, another central point of interest is the relationship between approaches to teaching and wellbeing. There is some evidence that student-centred teaching correlates positively with teachers' own emotional wellbeing, while a teacher- centred approach is associated with teachers' negative emotions towards teaching (Postareff & Lindblom-Ylänne, 2011). For instance, Trigwell (2009) found that teachers who relied on student-centred teaching approaches, described higher levels of satisfaction, motivation and confidence as opposed to teachers who focused on information transmission. Among the latter group of teachers, the levels of negative emotions, such as anxiousness and frustration, was generally higher. There is also some evidence concerning the relationship between teacher self-efficacy and the approaches to teaching, indicating that teachers tend to report higher levels of self-efficacy when using student-centred teaching strategies (Postareff et al., 2009). However, more research is needed in order to investigate the relationship between approaches to teaching and learning and psychological wellbeing concerning both the students as well as the teachers. The above-mentioned self-efficacy as well as self-compassion are discussed in more detail in the next chapter.

2.2 Self-compassion and self-efficacy as dimensions of psychological wellbeing

In the present study, teaching and study-related wellbeing are approached through their psychological dimensions, more specifically through self-compassion and self-efficacy. Psychological wellbeing refers to how individuals perceive themselves as functioning in life and it relates to processes such as self-acceptance, autonomy, feelings of personal growth and development, sense of competence and goal-directedness in life (Ryff, 1989). Self-compassion is perceived to be a general feature of one's psychological wellbeing, so the same definition of it is utilized in relation to both teaching and studying. On the whole, self-compassion refers to acknowledging that inadequacies and failure are a part of being human and that others as well as oneself are worthy of compassion even after experiencing a failure (Neff, 2003). For the purpose of this study, self-compassion is defined according to Neff's (2003) original approach which distinguishes three aspects from the concept: 1) treating oneself with kindness and understanding as opposed to harsh self-criticism and judgement; 2) having a sense of common humanity which entails seeing one's failures and experiences as a part of being human instead of perceiving them as isolating; and 3) practicing mindfulness in the sense of having a balanced awareness of one's painful thoughts and feelings rather than over-identifying with them.

Self-efficacy, on the other hand, is approached differently depending on the context. On a general level, self-efficacy refers to the performance-related expectancy of success and one's

beliefs about one's ability to accomplish a given task (Pintrich et al., 1991). The concept was first introduced by Bandura (1977) who understood it as the beliefs people have in relation to their own competencies which is partly based on past performances. In the context of higher education, self-efficacy can be understood as the students' belief about doing well academically, being able to understand even the most complex material and mastering the skills that are being taught in various courses (see Pintrich et al., 1991). Self-efficacy can also refer the extent to which higher education students feel that they are acquiring the relevant skills, knowledge, and competencies in their studies (Ayllón et al., 2019). Moreover, in the educational context self-efficacy is believed to influence the level of task performance, the degree of perseverance when performing a task as well as the overall effort that is put into completing a given task (Panadero et al., 2017).

In a similar vein, teacher self-efficacy refers to teacher's self-efficacy beliefs and outcome expectancies (Zee & Koomen, 2016). It is defined as the teachers' subjective beliefs in their ability to plan, organize and implement pedagogical activities to attain educational goals (Skaalvik & Skaalvik, 2010). Teachers with strong sense of self-efficacy tend to persist longer in challenging tasks, are more enthusiastic about teaching (Holzberger et al., 2013) and more willing to experiment with new teaching methods (Hoy & Spero, 2005). A strong sense of self-efficacy tends to correlate with greater levels of planning and organization (Zee & Koomen, 2016) and actively engaging in professional learning activities (Geijsel et al., 2009). In their systematic literature review, Zee and Koomen (2016) also found that a higher level of self-efficacy especially combined with having more teaching experience is associated with using student-centred teaching strategies such as the constructivist approach to teaching. Moreover, teacher self-efficacy beliefs are influenced by various demographic and contextual factors such as the career stage and perceived career opportunities, educational environment, and the overall satisfaction that teachers draw from their work and professional life (Caprara et al., 2006). For instance, Ismayilova and Klassen (2019) found that the teachers' sense of self-efficacy was systematically assessed lower at the beginning of the career, but it was perceived to have increased over time when gaining more experience.

3   Data and methods

3.1 Data collection

The data collection occurred during 2023 via online questionnaires in Webropol. The Webropol links were sent to each of the seven RUN-EU higher education (HE) institutions in Portugal, Ireland, Hungary, Austria, Finland, Belgium, and the Netherlands. The HE institutions which participated in the data collection are Polytechnic of Leiria [IPL] and Polytechnic of Cavado and Ave [IPCA] in Portugal, Technological University of the Shannon: Midlands Midwest [TUS] in Ireland, NHL Stenden [NHL Stenden] in the Netherlands, Széchenyi István University [SZE] in Hungary, Häme University of Applied Sciences [HAMK] in Finland and Vorarlberg University of Applied Sciences [FHV] in Austria. The data that was collected for this study is quantitative in nature. It consists of the questionnaire responses of HE students and teachers from the above-mentioned countries and institutions. The data collection targeted the students and teachers of the degree programmes in International Business, Engineering, and ICT. These fields were selected to ensure the comparability of the questionnaire data as these three programmes were found in each HE institution. Both bachelor's degrees and master's degrees from each programme were selected as well.

Each HE institution was responsible for the data collection concerning its own teachers and students and used their own preferred forms and platforms to gather the data, respectively. Accordingly, there was some variation between institutions in terms of how the participating students and teachers were approached: in some partner institutions the head of the degree programme conveyed the invitation to participate in the study for their respective teachers, while some partners utilized email listings. In other partner universities students were approached by visiting their lessons and introducing the survey and how to take part in it. Each institution also applied for required research and data collection permissions according to the institution-specific practices.

Participation was entirely voluntary for both target groups and the questionnaires were filled and analysed anonymously. The participants were asked to give their consent to participate in this study by filling a statement of consent which appeared at the start of the survey. Thus, participants were fully informed about data collection and analysis procedures and what would happen to their data before completing the questionnaire. The data was confidentially and securely stored in Häme University of Applied Sciences.

3.2 Instruments

Two quantitative questionnaires were used to collect the data of the present study. The name of the LearnWell questionnaire is an acronym for the Wellbeing of the Learning Community as its primary target group are HE students. The LearnWell questionnaire is mostly based on the

HowULearn survey developed at the University of Helsinki (see Parpala & Lindblom-Ylänne, 2012, but it has been further developed at Häme University of Applied Sciences. It is a robust and validated instrument to explore HE students learning processes. The HowUTeach questionnaire, on the other hand, is a self-assessment tool for HE teachers which aims to increase teachers' awareness of their own teaching and thus, increase their ability to reflect and develop their teaching (see Parpala & Postareff, 2021). The LearnWell questionnaire's target group is the student learning community, while the HowUTeach questionnaire was filled by the HE teachers.

The LearnWell questionnaire includes five broader themes; 1) learning processes; 2) experiences of the teaching-learning environment; 3) experiences of competence development; 4) study-related wellbeing; 5) and wellbeing. The questionnaire contains a total of 105 items on a 5-point Likert scale (1 = Totally disagree; 5 = Totally disagree). However, for the purpose of the present study only parts of the questionnaire were selected which focused mainly on the processes of learning. Specific areas included approaches to learning plus wellbeing, more specifically self-efficacy and self-compassion (see Table 1 for details). Approaches to learning is divided into three areas of: a deep approach to learning; a surface approach to learning; organised studying. Each of these three areas contains four statements. Approaches to learning stems from the shortened and modified version of the Approaches to Learning and Studying Inventory (ALSI) questionnaire by Entwistle et al. (2003) which has been further developed as a research instrument HowULearn (see Parpala & Lindblom-Ylänne, 2012).

Self-efficacy is measured by using the HowULearn questionnaire's five items for measuring study-related self-efficacy of students (Parpala & Lindblom-Ylänne, 2012). The HowULearn questionnaire's self-efficacy scale is modified from and based on Pintrich et al.'s (1991) original eight items. Self-compassion is divided into two different areas: self-criticism, and self-compassion with three statements per area. Self-compassion was measured with the shortened version of the Self-Compassion Scale (SCS) which derives from Neff's (2003) original 26-item scale. However, Lopez et al.'s (2015) recommendations were taken into consideration in the present study which led to the decision to use the shortened two-factor version of the SCS. The six items which measure self-compassion as well as self-criticism were utilized as such. The shortened version of the LearnWell questionnaire that was utilized in this study includes 23 items altogether. These are illustrated in Table 1 below. The LearnWell questionnaire also included background variables such as gender, age, institution, discipline, and degree program.

Table 1. The LearnWell questionnaire (shortened).

Scale	Factor	Item
Learning processes		
Approaches to learning	Deep	I look at evidence carefully to reach my own conclusion about what I'm studying.

The HowULearn questionnaire (Parpala & Lindblom-Ylänne 2012), modified from the ALSI questionnaire, (Entwistle et al., 2003)	approach to learning	Ideas and perspectives, I've come across while I'm studying make me contemplate them from all sides.
		I try to relate new material to my previous knowledge.
		I try to relate what I have learned in one module to what I learn in other modules.
	Surface approach to learning	Often, I have to repeat things in order to learn them.
		I often have trouble making sense of the things I have to learn.
		Much of what I've learned seems no more than unrelated bits and pieces.
		I am unable to understand the topics I need to learn because they are so complicated.
	Organised studying	On the whole, I've been systematic and organised in my studying.
		I organise my study time carefully to make the best use of it.
		I put a lot of effort into my studying.
		I carefully prioritise my time to make sure I can fit everything in.
Study related wellbeing		
Self-efficacy The HowULearn questionnaire (Parpala & Lindblom-Ylänne, 2012), modified based on Pintrich et al. (1991)	Self-efficacy	I believe I will do well in my studies.
		I'm certain I can understand the most difficult material in my studies.
		I'm confident I can understand the basic concepts of my own study field.
		I expect to do well in my studies.
		I'm certain I can learn well the skills required in my study field.
Self-compassion Self-Compassion Scale (SCS, Neff, 2003); two-factor solution (Lopez et al., 2015)	Self-criticism	I'm disapproving and judgemental about my own flaws and inadequacies.
		When I fail at something important to me, I become consumed by feelings of inadequacy.
		When I fail at something that's important to me, I tend to feel alone in my failure
	Self-compassion	I try to be understanding and patient towards those aspects of my personality I don't like.
		When something painful happens, I try to take a balanced view of the situation.
		I try to see my failings as part of the human condition.
23 items		

The HowUTeach questionnaire involves four themes: 1) approaches to teaching; 2) experiences

of environment and work community; 3) teaching-research connection and 4) teaching-related wellbeing. The questionnaire contains a total of 60 items on a 5-point Likert scale (1 = Totally disagree; 5 = Totally disagree) (Parpala & Pand ostareff, 2021). The HowUteach questionnaire was also shortened and areas of approaches to teaching as well as self-efficacy and self-compassion from teaching-related wellbeing were selected. Approaches to teaching is subdivided into four areas of: an interactive student-centred approach; a transmissive teacher-centred approach; an unreflective approach; an organised approach. Each of these four areas contains three statements. The approaches to teaching section was based on the Revised Approaches to Teaching Inventory (ATI-R) by Trigwell et al. (2005) and interview data by Postareff and Lindblom-Ylänne (2008).

Self-efficacy is based on the HowULearn questionnaire, and it was adapted to the teaching context to measure teachers' self-efficacy beliefs. It contains four statements in total. As self-compassion is not specific for only teaching nor studying, it is measured with the same instrument as in the LearnWell questionnaire for students, by using the two-factor version of the SCS which holds six items altogether. The shortened version of the HowUTeach questionnaire includes 22 statements which are presented in Table 2 below. The HowUTeach questionnaire also included the following background variables: gender, age, institution, faculty or discipline area, teaching experience and formal qualification of teaching.

Table 2. The HowU Teach questionnaire (shortened).

Scale	Factor	Item
Approaches to teaching		
Approaches to teaching Postareff & Lindblom-Ylänne (2008), ATI-R (Trigwell et al. (2005), the HowULearn questionnaire (Parpala & Lindblom-Ylänne, 2012)	Interactive approach	In my teaching, I create situations where I encourage students to discuss their thoughts and opinions about the topic.
		I set aside teaching time so that the students can discuss among themselves about the key concepts of the subject.
		In teaching situations, I provide an opportunity for students to deepen their understanding about the subject through discussion.
	Transmissive approach	The majority of my teaching time is spent transmitting information to the students about the topic.
		My teaching is focused on the good presentation of information to the students.
		The most important goal of my teaching is to deliver what I know to the students.
	Unreflective approach	I have trouble understanding how I can help the students learn.
		The students' learning process is so complicated that it is challenging for me to understand how I can support it as a teacher.
		It is difficult for me to understand what learning is all about.

	Organised approach	I am organised and systematic as a teacher.
		I put a lot of effort into my teaching.
		I spend a lot of time to prepare my teaching.
Teaching-related wellbeing		
Self-efficacy Modified and contextualized from the HowULearn questionnaire (Parpala & Lindblom-Ylänne, 2012)	Self-efficacy	I believe I can cope with my teaching tasks.
		I am confident that I can manage even in the most difficult teaching situations.
		I am certain, that I have the necessary pedagogical skills to manage in teaching tasks.
		I am confident that the students learn from my teaching.
Self-compassion Neff (2003), shortened SCS from Lopez et al. (2015)	Self-criticism	I'm disapproving and judgemental about my own flaws and inadequacies.
		When I fail at something important to me I become consumed by feelings of inadequacy.
		When I fail at something that's important to me, I tend to feel alone in my failure.
	Self-compassion	I try to be understanding and patient towards those aspects of my personality I don't like.
		When something painful happens, I try to take a balanced view of the situation.
		I try to see my failings as part of the human condition.
22 items		

3.3 Participants

The original goal of the present study was to collect questionnaire data from 40 teachers and 120 students from each of the participating higher education institutions. Originally 613 responses from higher education students as well as 257 responses from higher education teachers were received. However, the final data set was reduced and consisted of responses from 155 teachers and 550 students. The reduction was due to the following reasons: six teachers did not give their permission to use their data, so their responses were removed from the dataset; the focus of the study was Engineering, ICT, and International Business, so, responses were removed from 63 students and five teachers who had selected "Other" as their study programme or teaching field; many more teachers responded from the Polytechnic of Cavado and Ave (IPCA) in comparison to other institutions so IPCA's teacher responses were restricted to 20 teachers from International Business and 20 from Engineering. This was in line with the initial aim of collecting 20 responses from each discipline from each institution.

Teacher sample
To recap, the final dataset consists of responses from 155 teachers. As shown in Figure 2 and Table 3, respondents came from all the RUN-EU universities and represented different disciplines. However, as Figure 2 illustrates, there were some variations regarding how the

responses were distributed among the participating higher education institutions. For instance, IPCA is more heavily represented than IPL.

Figure 2. Number of teachers' responses (and % of sample) from each higher education institution
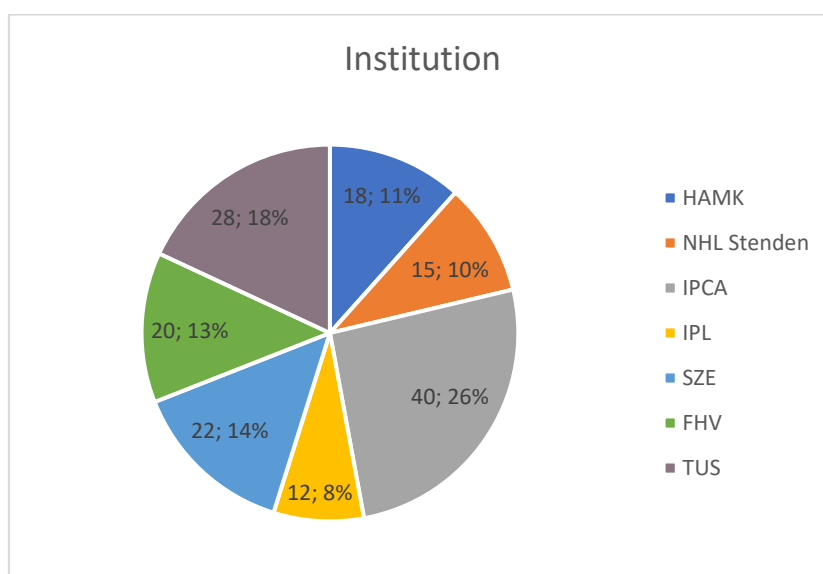
Table 3 below shows the distribution of the teachers' disciplines between International Business, ICT and Engineering, indicating that ICT remained somewhat underrepresented. Most of the teachers selected Engineering as their discipline. Table 3 also includes a column for "Mixed" which concerns situations where the teachers indicated that they teach on programmes from different fields, for instance, Engineering and ICT or ICT and International Business.

Table 3. Teachers by institution and discipline.

Institution	Discipline				
	Business	**ICT**	**Engineering**	**Mixed**	**Total**
HAMK	2	1	13	2	18
NHL Stenden	6	0	9	0	15
IPCA	20	0	20	0	40
IPL	0	0	9	3	12
SZE	11	0	9	2	22
FHV	5	4	4	7	20
TUS	0	5	19	4	28
Total	44	10	83	18	155

Concerning gender distribution, 59% of teachers identified as male and 39% as female. 2% did not wish to disclose their gender. The largest number of teachers belonged to the age groups of 40-49 years (39%) and 50-59 years (35%). Additional 10% of the teachers were between the ages

of 30 and 39 while 11% were over 60 years old. Only 3% of the respondents represent the age group of 20-29 years.

Most of the teachers had at least 10 years of teaching experience. The largest group of teachers had taught for 15 or more years (50%) while 18% reported to have taught between 10 to 15 years. 17% of the teachers had been working as a teacher for five years or less whereas the remaining 14% percent had five to ten years teaching experience. In addition, 58% did not have a formal teaching qualification, 42% did have a formal teaching qualification and 48 % had received other pedagogical training.

Student sample

Student data consists of responses from 550 students. The participants came from all RUN-EU universities and represent different study disciplines as shown in Figure 3 and Table 4. As with the teachers' sample, IPCA remains well represented. The number of students in some institutions, such as NHL Stenden and IPL, is significantly lower in comparison to others.

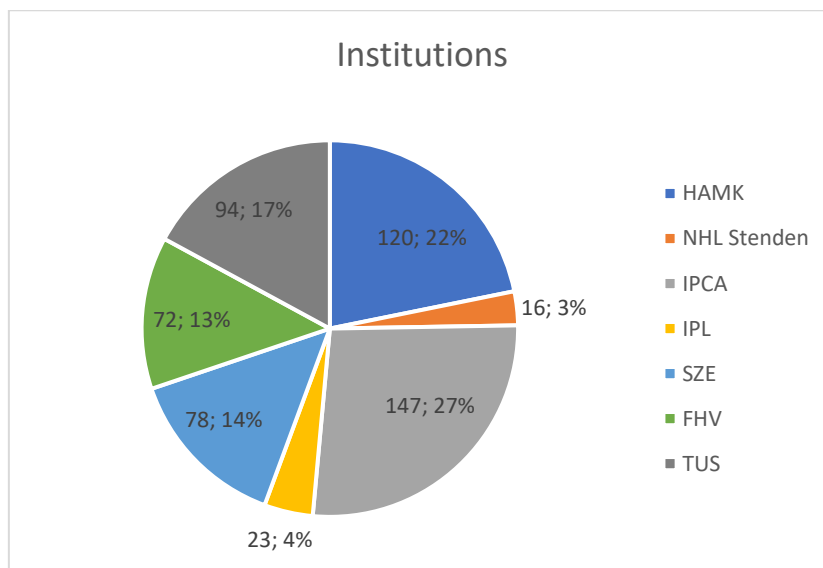*Figure 3. Number of student responses (and % of sample) from each higher education institution*

As mentioned above, Table 4 illustrates how different study disciplines were distributed among the student respondents. ICT has fewer respondents than International Business and Engineering and this was the same as with the teacher cohort. Engineering students are well represented, and this was the same as with the teachers too.

Table 4. Students by institution and discipline.

Institution	Study discipline			
	Business	ICT	Engineering	Total
HAMK	40	40	40	120
NHL Stenden	10	0	6	16
IPCA	46	0	101	147
IPL	0	4	19	23
SZE	60	0	18	78
FHV	25	19	28	72
TUS	6	88	0	94
Total	187	151	212	550

The gender distribution leaned more heavily towards students who identified as male with 62% representation in comparison to the percentage of females which was 37%. 1% identified as non-binary while two students did not wish to disclose the information about their gender. The age distribution of the students had some variation. The largest age group was found to be 18–21-year-olds with 47% representation. About 24% of the students were between 22 and 25 years whereas 20% were over 29 years old. Surprisingly, the smallest age group was 25-28-year-olds which consisted of 9% of the students who responded to the questionnaire.

Of the entire student sample, 39% of the students represented Engineering as their study discipline, 34% were studying International Business and approximately 28% studies ICT. Out of all the students, the overwhelming majority, approximately 86% were studying Bachelor degrees while 11% Master degrees. The remaining four percent did not disclose this information. Most students were at the beginning of their studies, with 62% of the sample currently studying in their 1st year, 22% in their 2nd and 11% in their 3rd. 3% had begun their 4th year and 1% were in their 5th year of study. Only one student was currently in their 6th year of study. 1% of the students left this question unanswered.

3.4 Analysis

Data analyses were conducted using IBM SPSS Statistics version 29. Independent-sample t-tests and one-way ANOVAs were conducted to answer RQs 1a and 2c. To answer RQs 1b and 2d, Pearson's correlations were investigated between the study variables. To explore RQ 3, HAMK and IPCA Engineering programs were selected as two cases. Teachers' approaches to teaching, and students' approaches to learning, and wellbeing were examined and compared to the overall sample means.

4   Results

4.1 The teachers' approaches to teaching in RUN-EU institutions

1a. How are the approaches to teaching related to different background variables (discipline/field of study, teaching experience, formal qualification in teaching)?

Discipline. All means and standard deviations of key outcome variables by teacher's discipline are presented in Table 5. One-way ANOVAs were conducted to test the differences in approaches to teaching and wellbeing between teachers from different disciplines. There was a statistically significant difference between groups in an interactive approach to teaching as shown by Welch's ANOVA (F_W (3, 151) = 3.425, p = .019). A Games-Howell post hoc test revealed that teachers from Business (4.24 ± 0.62) scored statistically significantly higher on an interactive approach to teaching compared to teachers from Engineering (3.77 ± 0.90, p = .004). There were no statistically significant differences between the other groups of teachers in terms of an interactive approach to teaching.

The differences between groups were statistically non-significant for the other approaches to teaching and the wellbeing outcomes.

Table 5. Means and standard deviations of key outcome variables by discipline.

	Business	ICT	Engineering	Mixed
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Interactive approach	4.24 (0.62)	4.00 (0.87)	3.77 (0.90)	4.02 (0.58)
Transmissive approach	3.35 (0.90)	3.57 (0.79)	3.35 (0.90)	3.33 (0.82)
Unreflective approach	2.23 (1.01)	1.77 (0.80)	2.09 (0.87)	1.91 (0.85)
Organized approach	4.27 (0.57)	4.50 (0.50)	4.22 (0.60)	4.35 (0.46)
Self-efficacy	4.16 (0.56)	4.35 (0.49)	4.04 (0.59)	4.26 (0.35)
Self-compassion	3.98 (0.66)	3.73 (0.60)	3.73 (0.70)	3.87 (0.85)
Self-criticism	2.83 (0.91)	2.27 (0.66)	2.73 (0.99)	2.57(1.05)

Notes: *N* = 155. Business n = 44, ICT n = 10, engineering n = 83, mixed n = 18.

Teaching experience. One-way ANOVAs were conducted to test the differences in approaches to teaching and wellbeing between teachers with different teaching tenure. All differences between groups were statistically non-significant for all the approaches to teaching and wellbeing outcomes. The mean values illustrated in Table 6 show a large variation between different groups, but the variation is not statistically significant. The means and standard deviations for each group are outlined in Table 6.

Table 6. Means and standard deviations of key outcome variables by teachers' teaching experience.

	0-5 years	5-10 years	10-15 years	15+ years
	M (SD)	M (SD)	M (SD)	M (SD)
Interactive approach	4.02(0.75)	3.95 (0.98)	3.94 (0.91)	3.92 (0.77)
Transmissive approach	3.19 (1.06)	3.47 (0.79)	3.44 (0.70)	3.36 (0.90)
Unreflective approach	1.98 (0.82)	1.97 (0.99)	2.21 (1.07)	2.12 (0.86)
Organized approach	4.16 (0.66)	4.45 (0.54)	4.14 (0.60)	4.29 (0.53)
Self-efficacy	4.13 (0.64)	4.11 (0.53)	4.12 (0.51)	4.12 (0.56)
Self-compassion	3.94 (1.00)	3.53 (0.79)	3.88 (0.58)	3.84 (0.58)
Self-criticism	2.90 (1.14)	2.92 (0.91)	2.50 (0.85)	2.66 (0.96)

Notes: *N* = 155. 0-5 years n = 27, 5-10 years n = 22, 10-15 years n = 28, 15+ years n = 78.

Formal teaching qualification. Independent-samples t-tests were conducted to compare teachers with formal qualifications to teachers without such qualifications in terms of their approaches to teaching and experienced wellbeing. The means and standard deviations for both groups are presented in Table 7. The results of the t-tests showed that most differences between teachers with and without formal teaching qualification in approaches to teaching and in all wellbeing, outcomes were statistically non-significant. However, there was a statistically significant difference in transmissive approach to teaching. Teachers with no formal teaching qualification scored statistically significantly higher on transmissive approach (3.54 ± 0.81) than teachers with a formal teaching qualification (3.11 ± 0.91, p = .002).

Table 7. Means and standard deviations of key outcome variables by teachers' formal teaching qualification.

	Formal qualification	No formal qualification
	M (SD)	M (SD)
Interactive approach	4.06 (0.81)	3.87 (0.82)
Transmissive approach	3.11 (0.91)	3.54 (0.81)
Unreflective approach	2.04 (0.84)	2.13 (0.95)
Organized approach	4.23 (0.59)	4.30 (0.56)
Self-efficacy	4.18 (0.60)	4.08 (0.53)
Self-compassion	3.89 (0.68)	3.77 (0.72)
Self-criticism	2.64 (1.02)	2.77 (0.91)

Notes: *N* = 155. Formal qualification n = 65, no formal qualification n = 90

1b. How are the approaches to teaching related to teachers' experienced wellbeing?

Pearson's correlations were run to evaluate the relationships between the approaches to teaching and teachers' experienced wellbeing. All correlations are presented in Table 8. Small, positive correlations were found between using an interactive approach to teaching and self-efficacy and between using an interactive approach and self-compassion. An interactive approach to teaching was negatively associated with a transmissive approach to teaching. A transmissive approach to teaching was positively correlated with unreflective and organized approaches to teaching and with self-criticism. A moderate, negative correlation between an unreflective approach to teaching and self-efficacy was found. A moderate, positive correlation between an unreflective approach and self-criticism was also found. Moreover, there was a small, positive correlation between an organised approach to teaching and self-efficacy. Wellbeing outcomes were also linked to each other as a moderate, positive correlation between self-efficacy and self-compassion was found, while self-efficacy and self-compassion were both negatively correlated with self-criticism.

Table 8. Means, standard deviations, and correlations of all key outcome variables in teachers' sample.

		M	*SD*	1	2	3	4	5	6
1	Interactive	3.95	0.82						
2	Transmissive	3.36	0.88	-.228**					
3	Unreflective	2.09	0.91	-.074	.239**				
4	Organized	4.27	0.57	.016	.236**	-.106			
5	Self-efficacy	4.12	0.56	.219**	-.023	-.410***	.233**		
6	Self-compassion	3.82	0.70	.192*	-.005	-.144	.133	.472***	
7	Self-criticism	2.71	0.96	-.073	.166*	.341***	.049	-.339***	-.346***

Notes. *N* = 115. * p < .05 ** p < .01 *** p < .001

4.2 Students' approaches to learning in RUN-EU institutions

2c. How are the approaches to learning related to different background variables (discipline, age, study year)

Study discipline. One-way ANOVAs were conducted to test the differences in approaches to learning and wellbeing outcomes between students from different study disciplines. There was a statistically significant difference between groups in an organized approach to learning (*F* (2,547) = 5.205, *p* = .006). A Tukey post hoc test revealed that students from Business (3.68 ± 0.85) scored statistically significantly higher on an organized approach to learning compared to students from ICT (3.43 ± 0.94, *p* = .023) and Engineering (3.42 ± 0.86, *p* = .011). There was no statistically significant difference between the ICT and Engineering students.

In terms of wellbeing, there was a statistically significant difference between students from different study disciplines in self-efficacy beliefs ($F_{(2, 547)}$ = 3.062, p = .048). A Tukey post hoc test revealed that students from Business (4.06 ± 0.75) had statistically significantly higher self-efficacy beliefs compared to students from ICT (3.86 ± 0.73, p = .038). There was no statistically significant difference between Business and Engineering, and between ICT and Engineering students.

Table 9. Means, standard deviations, and correlations for all key outcome variables in the student sample by study discipline.

Discipline	Business	ICT	Engineering
	M (SD)	*M (SD)*	*M (SD)*
Deep approach	3.79 (0.70)	3.89 (0.64)	3.84 (0.60)
Surface approach	2.84 (0.69)	2.89 (0.68)	2.93 (0.73)
Organized approach	3.68 (0.85)	3.43 (0.94)	3.42 (0.86)
Self-efficacy	4.06 (0.75)	3.86 (0.73)	3.99 (0.73)
Self-compassion	3.57 (0.78)	3.50 (0.84)	3.53 (0.79)
Self-criticism	3.08 (1.01)	3.18 (1.08)	3.11 (1.06)

Age. One-way ANOVAs were conducted to test the differences in approaches to learning and wellbeing between students from different age groups. There was a statistically significant difference between age groups in a surface approach to learning as shown by one-way ANOVA ($F_{(3, 546)}$ = 2.735, p = .043). However, Tukey post hoc test did not reveal any statistically significant differences in self-criticism between different groups when conducting pairwise comparisons.

There was a statistically significant difference between groups in an organized approach to learning ($F_{(3, 546)}$ = 8.452, p < .001). A Tukey post hoc test revealed that students in the age group 29+ years (3.86 ± 0.75) scored statistically significantly higher on an organized approach to learning compared to students from the age groups of 18-21 years (3.38 ± 0.92, p < .001) and 22-25 years (3.44 ± 0.89, p < .001).

In terms of wellbeing, there was a statistically significant difference between age groups in self-criticism ($F_{(3, 546)}$ = 4.278, p = .005). A Tukey post hoc test revealed that students in the age group 29+ years (2.83 ± 1.12) scored statistically significantly lower on self-criticism compared to students from the age group 18-21 years (3.24 ± 1.05, p = .003).

The differences between groups were statistically non-significant for a deep approach to learning, self-efficacy beliefs, and self-compassion.

Table 10. Means, standard deviations, and correlations for all key outcome variables in the student sample by student age.

Age group	18-21	22-25	25-28	29+
	M (SD)	*M (SD)*	*M (SD)*	*M (SD)*
Deep approach	3.78 (0.63)	3.80 (0.67)	3.89 (0.68)	3.98 (0.62)
Surface approach	2.95 (0.70)	2.83 (0.68)	3.02 (0.77)	2.76 (0.68)
Organized approach	3.38 (0.92)	3.44 (0.89)	3.57 (0.78)	3.86 (0.75)
Self-efficacy	3.91 (0.76)	4.03 (0.72)	3.88 (0.83)	4.09 (0.68)
Self-compassion	3.47 (0.84)	3.59 (0.78)	3.53 (0.74)	3.62 (0.76)
Self-criticism	3.24 (1.05)	3.09 (0.97)	3.19 (0.93)	2.83 (1.12)

Notes: 18-21 years n = 257, 22-25 years n = 133, 25-28 years n = 48, 29+ years n = 112.

Stage of studies. One-way ANOVAs were conducted to test the differences in approaches to learning and wellbeing between students at different stages of their studies.

There was a statistically significant difference between groups in a surface approach to learning as shown by one-way ANOVA (F (2, 542) = 5.824, p = .003). A Tukey post hoc test revealed that 2n year students (3.06 ± 0.70) scored statistically significantly higher on a surface approach to learning compared to 1st year students (2.82 ± 0.71, p = .003). There were no statistically significant differences between the groups of 1st and 3rd+ year students and between 2nd and 3rd+ in terms of a surface approach to learning.

The differences between groups were statistically non-significant for a deep and organized approach to learning, self-efficacy beliefs, self-criticism, and self-compassion.

Table 11. Means, standard deviations, and correlations for all key outcome variables in the student sample by stage of studies.

Stage of studies	1st year	2nd year	3rd and higher year[1]
	M (SD)	*M (SD)*	*M (SD)*
Deep approach	3.86 (0.62)	3.76 (0.64)	3.85 (0.76)
Surface approach	2.82 (0.71)	3.06 (0.70)	2.94 (0.59)
Organized approach	3.50 (0.88)	3.53 (0.85)	3.51 (0.88)
Self-efficacy	4.00 (0.75)	3.90 (0.73)	3.97 (0.75)

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[1] Since the student sample contained smaller groups of more senior students, 3rd and more senior year students were combined into one group for the analyses.

Self-compassion	3.52 (0.80)	3.53 (0.79)	3.59 (0.85)
Self-criticism	3.04 (1.03)	3.23 (1.03)	3.24 (0.96)

Notes: *N* = 545. 1st year n = 342, 2nd year n = 120, 3rd and higher year n = 83.

2d. How are the approaches to learning related to students' experienced wellbeing?

Pearson's correlations were run to investigate associations between students' approaches to learning and their experienced wellbeing. A deep approach to learning was weakly but negatively associated to a surface approach to learning. Moreover, a deep approach to learning was positively correlated to an organized approach to learning, self-efficacy, and self-compassion. A surface approach to learning was negatively associated to students' self-efficacy and positively to self-criticism. An organized approach to learning was positively related to both self-efficacy and self-compassion. Self-efficacy was positively related to self-compassion and negatively to self-criticism. Finally, there was also a small negative correlation between self-compassion and self-criticism. All correlations are presented in Table 12.

Table 12. Means, standard deviations, and correlations between students' approaches to learning and wellbeing outcomes.

		M	SD	1	2	3	4	5
1	Deep approach	3.84	0.64					
2	Surface approach	2.89	0.70	-.132**				
3	Organized approach	3.51	0.88	.400***	-.066			
4	Self-efficacy	3.98	0.74	.494***	-.407***	.395***		
5	Self-compassion	3.53	0.80	.351***	-.008	.306***	.398***	
6	Self-criticism	3.12	1.05	.013	.313***	-.063	-.184***	-.178***

Notes. *N* = 550 ** p < .01 *** p < .001

4.3 The relationships between teachers' approaches to teaching, students' approaches to learning and wellbeing

3e. Are there differences between disciplines and institutions?

Small and unequal sample sizes and the nature of collected data made comparisons between disciplines and institutions in terms of the relationships between teachers' approaches to teaching, students' approaches to learning and wellbeing challenging. In Table 13 we highlight two cases where teachers' approaches to teaching, students' approaches to learning, and wellbeing in HAMK and IPCA Engineering study programs were examined. The table shows whether the subsample (e.g., teachers from HAMK's engineering programme) have a higher or

lower mean than the overall sample on key outcomes. This allows us to observe whether teachers' approaches to teaching in a certain programme and students' approaches to learning and wellbeing in the same programme are unidirectional. However, these results should be interpreted with caution. Future studies with larger sample sizes and multilevel data where students' responses can be linked to their teachers' responses would help to better answer this research question.

Table 13. Teachers' approaches to teaching and students' approaches to learning, and wellbeing among HAMK and IPCA Engineering students and teachers.

		HAMK Engineering		IPCA Engineering	
		M (SD)	Comparison	*M (SD)*	Comparison
		Teachers (n = 13)		Teachers (n = 20)	
Approaches to teaching	Interactive	4.03 (0.63)	↑	4.13 (0.78)	↑
	Unreflective	1.77 (0.53)	↓	2.37 (0.87)	↑
	Organized	4.10 (0.64)	↓	4.28 (0.51)	↑
		Students (n = 40)		Students (n = 101)	
Approaches to learning	Deep	3.64 (0.64)	↓	3.93 (0.50)	↑
	Surface	2.59 (0.82)	↓	3.03 (0.66)	↑
	Organized	3.28 (0.91)	↓	3.50 (0.81)	↓
Student wellbeing	Self-efficacy	4.11 (0.74)	↑	3.95 (0.62)	↓
	Self-compassion	3.46 (0.83)	↓	3.65 (0.77)	↑
	Self-criticism	2.45 (1.13)	↓	3.33 (0.98)	↑

Notes: Comparison to the mean of the entire Engineering sample. ↑ indicates that the subsample has a higher mean that the overall sample and ↓ that the subsample has a lower mean than the overall sample. Positive differences are marked in green and negative in red.

5   Discussion and conclusions

In higher education institutions across Europe there is a constant and growing interest in developing innovative pedagogical practices that promote high-quality learning. The wellbeing of students (Asikainen et al., 2019) and teachers (Dreer, 2023; Hascher & Waber, 2021) as well as their relationship with approaches to teaching (Postareff et al., 2023) and learning (Asikainen et al., 2022) have emerged as topical themes in the field of higher education pedagogy in the last few years. The present study investigated the teaching and learning processes and their interrelations with wellbeing indicators among the teachers and students in seven European RUN-EU higher education institutions. The main aim of the deliverable D3.4 Mapping the Best Pedagogical Practices, which explored the interconnections of teaching, learning and wellbeing, was to explore and understand those pedagogical practices and frameworks which support and promote high-quality learning in higher education institutions. These are discussed next.

Interestingly, the results of this study illustrated that there is a positive relationship between transmissive teaching by those with no formal pedagogical qualification. To recap, a transmissive approach to teaching refers to teacher-centeredness which is characterised by fairly one-sided interaction as teachers aim to mostly transfer their knowledge to students, and so low levels of collaboration and interaction between the students (Postareff & Lindblom-Ylänne, 2008). Importantly, this finding shed light on the significance of receiving formal pedagogical training and, in doing so, eventually completing a formal pedagogical qualification. This allows teachers to develop their skills, step away from teacher-centeredness and embrace more student-centered teaching strategies as they begin to reflect on their own teaching and their conceptions about learning (Postareff et al., 2007). This relationship between pedagogical training and approaches to teaching echoes findings from prior research (e.g., Postareff et al., 2007, 2008; Gibbs & Coffey, 2004). It should be mentioned however, that in some studies the evidence supporting links between pedagogical training and teaching approaches is more inconclusive (e.g., Ho et al., 2001).

In Postareff et al.'s (2007) study, it was found that the more pedagogical training the teachers had, the more student-centred they were in addition to having the strongest self-efficacy beliefs as well. Based on their findings, Postareff et al. (2007) recommend that higher education teachers should be encouraged to continue their higher education pedagogy studies even after completing the basic course of higher education pedagogy. This allows them to become more aware of their approaches to teaching, strengthen their self-efficacy beliefs and in time, shift towards more student-centred teaching strategies and methods (Postareff et al., 2007; Kaye & Brewer, 2013). It is important to note that pedagogical training should be more constant and lasting in comparison to short-term training courses, since increasing teachers' awareness and changing their conceptions and perceptions of teaching and learning occur somewhat slowly (Postareff et al., 2007). Shorter pedagogical training courses could have unwanted and unplanned effects on approaches to teaching and teacher wellbeing, resulting in becoming even more teacher-centred (Ödalen et al., 2019), losing confidence as a teacher and having lower levels of self-efficacy (Postareff et al., 2007). According to Postareff et al. (2007), the positive

effects of pedagogical training become evident around the one-year mark, while Gibbs and Coffey (2004) assert that it is approximately between 4 and 18 months of pedagogical training when the shift towards student-centeredness begins to emerge.

Some intriguing and meaningful connections were also found among the student sample regarding the stage of studies and approaches to learning. According to the results, the stage of studies was related to surface approach to learning, but the connection was statistically significant only between the students of 1st and 2nd year of study. The results indicate that by their 2nd year of study, higher education students studying in RUN-EU universities seem to have adopted surface level learning strategies for instance relying mostly on only remembering the content of the material and reproducing the same information in an exam (Entwistle, 1998). This finding contradicts somewhat the literature and how higher education is assumed to affect students' learning. Higher education aims to produce high-skilled graduates for the workforce and to foster the skills that higher education students need to be versatile experts in their respective fields (Asikainen & Gijbels, 2017). Academic achievement and high-quality learning that is connected to this premise, is expected to involve deeper level learning strategies to increase critical thinking and active knowledge construction (Asikainen, 2014; Biggs, 2003). It is therefore assumed and even expected by teachers that students' approaches to learning develop towards more deeper level learning strategies as their studies progress (Baeten, Kyndt, Struyven, & Dochy, 2010; Prosser & Trigwell, 1999). However, Asikainen and Gijbels (2017) found that prior research has offered evidence for both an increase and decrease of a surface approach to learning (e.g., Walker et al., 2010; Fryer, 2016) as well as an increase and decrease of deeper level learning strategies (e.g., Asikainen et al., 2014; Prat-Sala & Redford, 2010). Asikainen and Gijbels (2017) suggest that the inconsistency in the literature may be due to the context-specific and fluid nature of approaches to learning as they can vary across different courses (e.g., the topic, the teacher, the utilized assessment methods) and learning contexts even if the field of study remains stable.

However, the scope of the data in this study does not allow us to conclude what might explain the shift towards more surface-level learning strategies. Although, Geitz et al. (2016) suggest that the increase in a surface approach might generally be due to the forms of summative assessment the students are required to complete to meet the requirements of the courses for 2nd year students. This may lead students to determine that surface level learning strategies are sufficient and suitable for their studies. These results can be explained by the fact that teaching, the teaching environment, and especially assessment methods strongly influence how students' study. In addition, motivation can play a role in guiding the way how students study. It may be that the content is not relevant to them and does not meet their needs for the future, as they themselves perceive the needs of future working life. Still, this finding gives higher education teachers valuable information in terms of finding suitable pedagogical tools for promote adopting and, most importantly, *maintaining* more deeper level learning methods and strategies that higher education students could carry with them to their 2nd and 3rd year of study as well. This could be accomplished by developing a student-centred teaching culture in higher

education. Knight and Trowler (2000) also suggest that this requires innovation, new ways of pedagogical thinking in teaching staff and educational development units as well as the active facilitation of collaboration by the departmental leadership. To reiterate, higher education institutions could also offer more long-term and continuous pedagogical training for teachers, as the positive connection between first student-centeredness and a deep approach to learning (e.g., Watters & Watters, 2007; Wilson & Fowler, 2005; Entwistle & Ramsden, 1983) and second, as pedagogical training and student-centeredness (e.g., Postareff et al., 2007, 2008; Gibbs & Coffey, 2004) are well documented in the literature.

The results of this study also showed that there are some interesting and meaningful interrelations between various dimensions of wellbeing and approaches to teaching and learning. To a large extent, the discovered relationships appeared to be similar between both target groups. With both students and teachers, an organised approach was positively related to self-efficacy, and the students were also more likely to be compassionate towards themselves. The students who had adopted a deep approach to learning were also more likely to be organized in their studying, have stronger self-efficacy beliefs, be more compassionate towards themselves when needed. These connections are intriguing in many ways. Research suggests that adopting a deep approach to learning tends to yield better learning outcomes and academic achievements (Watters & Watters, 2007; Entwistle & Ramsden, 1983). According to the findings, students who adopted deeper learning strategies were also less likely to rely on a surface approach which was also associated with lower self-efficacy. Various studies have also emphasized the relationship between approaches to learning and self-efficacy beliefs, the general conclusion being that it is precisely deeper level learning strategies which are linked to stronger self-efficacy beliefs (e.g., Nieminen et al., 2021; Diseth, 2011; Prat-Sala & Redford, 2010).

Prat-Sala and Redford (2010) argue for a cause-and-effect relationship between self-efficacy and approaches to learning. They suggest that students already existing low self-efficacy beliefs encourage them to adopt superficial and inadequate learning strategies as they do not believe in their own abilities. This results in a poorer academic achievement which, in a vicious circle, in turn reinforces their low self-efficacy beliefs. By the same token, it could perhaps be argued that higher education students with strong levels of self-efficacy adopt deeper level learning strategies precisely because they believe in their own capabilities of performing well even in more challenging learning tasks that involve higher-level thinking and cognitive processing. Alternatively, it may conceivably be the deeper level learning strategies and processes that lead to experiences of academic accomplishment, competency and believing in one's abilities. Unfortunately, this study's data does not allow us to determine cause-and-effect relationships. However, it is important for higher education teachers to find ways to cherish and promote both the self-efficacy of students as well as a deep approach to learning since their relationship might be reciprocal in nature.

Research has shown that organized studying is also associated with a deep approach to learning (e.g., Parpala et al., 2010; Entwistle et al., 2000), this positive correlation being replicated in this study as well. However, as discussed earlier, it should be born in mind that an organized approach is not an approach to learning per se, but rather, an approach to studying as it refers to the ways students organize, plan, and proceed in their studies. In other words, on its own, organized studying does not necessarily provide meaningful information regarding promoting high-quality learning through teaching, since it leans mostly on students' own efforts in terms of planning their studies. However, combined with self-efficacy and a deep approach to learning and their positive correlation with an organized approach, it indicates how valuable student-centred teaching strategies are. According to our findings, students who adopt deeper level learning strategies tend to have good organization skills, resulting in high-quality learning, completing studies in time. This all therefore decreases the likelihood that they will be overwhelmed by their workload as courses and tasks are completed efficiently and on time.

More interesting and positive correlations were found regarding approaches to teaching and wellbeing outcomes. Teachers who had adopted more student-centred teaching strategies, were less likely to utilize transmissive and teacher-centred approaches to teaching (cf. dissonant profiles, Uiboleht et al., 2018, 2019; Postareff & Lindblom-Ylänne, 2011). In the light of the findings, relying on interactive pedagogical practices and reflecting on one's teaching results in higher levels of self-compassion and self-efficacy as well. This echoes findings from other studies which suggest that an interactive approach to teaching and reflecting on one's teaching are generally perceived as beneficial, are desirable pedagogical practices and desirable outcomes of pedagogical training (e.g., Postareff et al., 2007; Gibbs & Coffey, 2004). Interactive approaches and reflective practices in turn, promote high-quality learning (e.g.,Trigwell et al., 1999; Trigwell et al., 1998) and teacher wellbeing through self-efficacy (Cao et al., 2018; Kaye & Brewer, 2013; Postareff et al., 2007).

However, the same issue applies here regarding the cause-and-effect relationship of self-efficacy and approaches to teaching as discussed above. Some argue that teachers who have a stronger sense of self-efficacy believe in their teaching skills and are more likely to utilize interactive and student-centred teaching strategies (Cao et al., 2018; Temiz & Topcu, 2013; Pitkäniemi, 2002). However, it is difficult to determine whether the already existing high levels of self-efficacy and confidence lead to an increased willingness and readiness to teach in a student-centred interactive way (Cao et al., 2018) or whether using student-centred, interactive methods impact positively on teachers' self-efficacy beliefs and confidence. Cao et al. (2018) suggest that their relationship might be reciprocal and this to reiterate, has important practical implications for pedagogical training. It is important to support the development of both the teachers' pedagogical abilities and self-efficacy by offering them more opportunities to develop their pedagogical awareness and ability to create student-student and student-teacher interaction (Postareff et al., 2023).

To reiterate, transmissive, unreflective teaching approaches and surface learning approaches are generally considered to be less beneficial to the development of both teachers and students and their wellbeing in comparison to deep learning and interactive approaches. It was therefore expected that in this study transmissive, unreflective teaching and surface level learning would be related to more negative wellbeing outcomes. Indeed, their relationships with the explored wellbeing outcomes were reversed, meaning that students and teachers experienced higher levels of self-criticism, lower levels of self-efficacy and self-compassion or various combinations of them. Many of these less favourable associations with well-being also echo in literature, starting from the negative relationship between students' self-efficacy and surface approach to learning (e.g., Nieminen et al., 2021; Trigwell et al., 2013) to teachers' lower self-efficacy beliefs and unreflective approach (e.g., Postareff et al., 2023). Although, there are some studies which illustrate that teachers might have a strong sense of self-efficacy regardless of their approach to teaching (e.g., Postareff, Katajavuori et al., 2008; Trigwell & Lindblom-Ylänne, 2005). The near-zero correlations discovered in earlier studies are explained by the fact that teachers' sense of self-efficacy relates to only their confidence in teaching and their beliefs about their capability, which can be relatively high regardless of the approach to teaching being utilized (Postareff, Katajavuori et al., 2008).

This study revealed that a transmissive approach was positively correlated with an unreflective approach and self-criticism. Result is in line with previous research on vocational teachers (Postareff, Lahdenperä, & Virtanen, 2021). The link between transmissive and unreflective teaching is interesting. Postareff et al. (2023) assert that is precisely the increase in pedagogical awareness and starting to reflect ones' teaching which paves the way towards starting to use student-centred methods. They argue that a teacher's ability to reflect on their own teacher learning, how their teaching affects their students' learning Is arguably related to a teacher's efforts to engage students and adopt interactive elements in their lectures. Interestingly, among the teachers who participated in this study, a transmissive approach to teaching was also positively related to an organized approach to teaching. The organised approach to teaching can be interpreted in different ways depending on whether it is combined with interactive or transmissive teaching method. This is because an organised approach per se does not give insight into how the teachers actually teach during the lectures and whether the students are actively engaged. Surprisingly in this study, it was a transmissive and organised approach which shared a statistically significant, positive relationship as opposed to an interactive and organised approach as in Postareff et al.'s (2023) study. For the teacher participants in this study, the combination of an organized and transmissive approach resulted in even stricter lecture plans with little time for student-student and student-teacher interaction and general inflexibility towards any changes in teaching (Postareff & Lindblom, 2008). The positive correlation was small but it is still intriguing to reflect on why this study' s findings of a transmissive and organised relationship differs from the interactive-organised relationship uncovered by Postareff.

Lastly, this study also aimed to investigate the relationships between approaches to teaching, approaches to learning and wellbeing through exploring whether differences exist between subject disciplines and RUN-EU institutions. This goal however, proved to be challenging due to the scope of the data and its representativeness. After some consideration, we selected the students and teachers from Engineering at HAMK and IPCA to explore how approaches to teaching, learning and wellbeing outcomes and their respective mean values relate to the larger subsample of all Engineering students and teachers. Overall, the mean values and positive and negative differences of the HAMK and IPCA Engineering subsample were similar. This can be seen by the number of differences in negative characteristics such as lower levels of self-compassion, and positive ones such as higher levels of self-efficacy.

Interestingly, there were only two instances where the HAMK and IPCA Engineering subsamples agreed with one another: teachers' interactive approach to teaching (positive change) and students' organized approach (negative change). In other words, Engineering teachers from both institutions reported higher mean values in comparison to the overall sample, while for the students, the trend was reversed, as they estimated themselves to be less organized as other Engineering students in RUN-EU institutions. Prior research offers relatively limited insights to the learning and teaching approaches in distinct fields and disciplines and Engineering specifically. There is a study by Salmisto et al. (2017) which found that civil engineering students adopted deep approach to learning more frequently in comparison to surface approach and organized learning. In their study, the largest and most common student profile they found was organized students, characterized as average values regarding deep approach and low on surface approach. However, in the present study, it was precisely the organized approach that was evaluated lower among HAMK and IPCA students, whereas they differed greatly from one another regarding whether the deep and surface approach and its mean values were leaning towards the same direction as in the overall sample. The diverse differences between HAMK and IPCA are likely due to the complex contextual, geographical, national, and cultural factors which concern the differences between higher education institutions, pedagogical practices and the different ways Engineering as a field is being taught and studied in diverse national and spatial locations.

To conclude, based on the main results of the present study, the link between teaching, learning and wellbeing is evident regarding both negative and positive wellbeing outcomes. Firstly, the approaches to teaching and learning usually perceived as less effective, that is, unreflective and transmissive teaching and surface learning, were generally related to more negative wellbeing outcomes, such as higher self-criticism and low self-compassion and self-efficacy. Second, interactive teaching and pedagogical reflectiveness (i.e., low scores on unreflective approach) plus a deep approach to learning were associated with more positive wellbeing outcomes, including higher levels of self-efficacy and self-compassion. Third, we focused on students and teachers from Engineering at HAMK and IPCA to explore how they relate to the larger subsample of all students and teachers from Engineering from all RUN-EU institutions. Intriguing similarities were found regarding an organized and interactive approach, but overall, differences emerged.

This is to be expected given the different, complex national and cultural factors that can impact on findings in any country-based comparison. As discussed above, the majority of our findings echo those in found in research about what is understood by high-quality learning and teaching that promote the wellbeing of the higher education community.

Recommendations for the RUN-EU Universities on how to develop teaching and the learning based on collaborative work during the years 2021-2023 in WP3 Future and Advanced Skills Academies (FASA):

Communal pedagogical understanding

- Communal understanding of the importance and the definition of the future skills by students, teachers, and institutions
- Communal understanding of the core concepts of pedagogical framework such as student-centred approach to teaching by teachers and institutions
- Recognition of the importance of future skills at the institutional level; Institutional support to enhance the role of future skills

Teaching and learning activities

- Supporting the deep approach to learning among 1st year students and finding ways to maintain it among 2nd year students as well (avenue for future research regarding what might cause this shift)
- Developing towards student-centeredness which, in turn, is likely to reflect positively to deeper level learning strategies Including the future skills into curricula
- Alignment of teaching: intended learning outcomes, teaching and learning activities (methods, tasks) and assessment are aligned and support the learning of future skills
- Supporting the students to identify the skills and notice their competence development
- Promotion of practice or working life connection when developing the future skills

Pedagogical development of RUN-EU teachers

- Formal qualification of pedagogical education
- Increasing engagement to participate in the pedagogical development programmes that are given by FASA and focusing on the pedagogical framework and the development of the future skills
- Employment of collaborative approaches in teaching and supporting the development of reflective thinking and active agency of students
- Guarantee teachers' possibilities for pedagogical development
- Establishment of teacher collaboration to work towards common objectives.

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