TESTEd

Discussion Paper
on the implemention of
cross-cutting issues in teacher education

Published by the TESTEd Consortium

1. First things first — the whys and what of TESTEd

Europe faces global, cross-cutting demographic, climatic, economic, technological, and political challenges for which its education systems must prepare future generations. Teachers, therefore, have a growing need and responsibility to address these challenges in order to ensure high-quality education for all young people, so that pupils from diverse backgrounds become politically mature European citizens who are able to adapt to future societal changes.

As "teachers, trainers and educational staff are at the heart of education […] they play the most important role in making education a fruitful experience for all learners" (European Commission 2020, p. 9). Thus, it is vital to include cross-cutting issues, i.e., sustainability, democratic education and active citizenship, gender sensitivity, multilingualism, and diversity as well as the digitalization of learning spaces, in teacher education to prepare pre-service teachers for their future profession and support in-service teachers, already confronted with these issues in their classroom, through further professional development offers.

The TESTEd project aims to further the integration of socially relevant cross-cutting issues in teacher education across Europe. However, systematic challenges and limitations in teacher education and education systems complicate this process. This discussion paper will, therefore, point towards these challenges and showcase, how the TESTEd project tries to solve them. First, it will present the ideas behind the TESTEd project and the development of a European Syllabus in Teacher Education that focusses on cross-cutting issues.

The discussion paper will then go into the current state of work on the Syllabus, its structure, target audience and how the consortium integrates the Syllabus in (initial) teacher education. Following this, it will discuss the first implementation of the Syllabus in initial teacher education, based on a multi-perspective approach, considering a formative evaluation carried out with pre-service teachers as well as experiences and lessons learnt from lecturers and consortium partners. Finally, the discussion paper will give an outlook on the next steps in the TESTEd project, namely the integration of the Syllabus in Continuous Professional Development courses (CPD courses), the revision of the Syllabus, and its extension to good practice examples from teacher education in Europe.

1.1 Cross-cutting challenges in teacher education

Even though the European Commission strives to include cross-cutting issues in all European education systems by 2025, providing students with inclusive and equal opportunities in education and paving the way for the digital and green transition, teachers and teacher educators still report a high need for training and support in these fields.

In 2020, the European Commission published its "Communication on achieving the European Education Area by 2025" with the aim to (a) set out a vision for European education in the up-coming years and (b) present concrete steps and strategies to deliver this vision (European Commission 2020, p. 4). In this publication, the European Commission points out, that across European education systems individual pupils' experiences still "follow social patterns" (ibid., p. 6), with children from disadvantaged or with migrant backgrounds faring worse in schools (ibid., p. 7). Furthermore, even though women have higher educational attainment levels than men, there is still a gender gap, often in scientific fields of study leading to higher-paid vocations (European Commission 2020, p. 7). It is, therefore, one of the EU's priorities to address and reduce the inequalities in education and foster inclusivity and gender equality. However, as these are immense challenges for schools, teachers and teacher educators — as multipliers in the field — need support and continuous professional development to be able to meet these requirements in their classrooms. As an example, according to the OECD Teaching and Learning International Survey (TALIS 2018), 33% of teachers on average express that they do not feel able to cope with the challenge of multicultural classrooms and report a high need for training in teaching multicultural or multilingual settings.

Education also plays an important role in the green and digital transition of the European Union (European Commission 2020, p. 8). These transitions are also called "twin" transitions and are a cornerstone of European policy.

> The green transition aims to achieve sustainability, and combat climate change and environmental degradation. At the same time, the growing significance of digital technologies is transforming societies and economies. In the digital transition, the European Union aims to harness digital technologies for sustainability and prosperity, and to empower citizens and business. (European Commission et al. 2022, p. iv)

To be able to achieve environmental sustainability, education systems need to work as catalysts to (a) make the complexities involved in a green transition understandable to pupils, (b) foster their skills so that they can work towards a climate-neutral, circular economy and (c) bridge the knowledge-action gap to guide fundamental changes in people's behaviour.

Furthermore, as digital literacy is key to practically all vocations in all sectors, schools need to prepare their students, so that they can compete on the labour market. Additionally, as we spend more time in digital spaces, our worldviews and actions are increasingly shaped by exchanges, information, or opinions online. Pupils need to acquire critical media literacy to be able to navigate and discriminate the information they consume and understand data and privacy concerns linked to using social media platforms in order to become active and mature citizens in democratic societies.

The profound importance of these two key cross-cutting issues to the future prosperity of Europe is often showcased in national curricula and guidelines for teaching, that posit digital literacy and Education for a Sustainable Development (ESD)[1] as cross-curricular topics that should be integrated into all subjects as interdisciplinary teaching principles. However, while EU and national guidelines set out competencies for pupils, there are no competency frameworks for teachers in ESD, making it more difficult for teacher educators to implement sustainability in initial teacher education or continuous professional development offers.

> **For example:**
>
> In Germany, ESD is often still anchored to some subjects, namely the sciences or geography. This also holds true for initial teacher education and CPD actions, where — even though ESD is understood as a cross-sectional task for all subject areas — most education activities are being conducted by subjects with an "ESD-affinity", i.e., physics, biology, chemistry, and geography. Furthermore, a 2021 report by the German Federal Ministry of Education and Research observed a low degree of integration of ESD in module descriptions of teacher training (BMBF 2021, p. 15).
>
> In Spain, the integration of ESD as a cross-cutting theme is still in its initial stages. While ESD is briefly incorporated into subjects such as biology or geography, similar to what is observed in Germany, it holds particular significance in the context of physical education, where it is linked to the promotion of a healthy lifestyle and environmental awareness. Despite the recent release of guidelines by the Ministry of Education, which are based on the GreenComp framework, they have yet to be fully implemented in the classroom (Ministerio de Educación, Formación Profesional y Deportes 2023).
>
> Similarly, in Finland, the importance of ESD is highlighted at different key policy documents — for example, in the Finnish National Core Curriculum for Basic Education, the Finnish National Forum for Skills Anticipation, and several national reports on how to carry out Agenda 2030. And yet, ecological sustainability appears only in 3% of all objectives of instruction in the National Core Curriculum (Myrkä 2023). The global goals of ESD fail to translate into concrete actions by the time they reach everyday life in Finnish schools due to "insufficiently clear instructions in the area of sustainability" (ibid., p. 1).

Here, we can observe a decided difference between ESD and digital competencies. The theoretical underpinning for the development of digitisation-related competencies are the EU's DigComp 2.2 (Vuorikari, Kluzer and Punie, 2022) and DigCompEdu (Punie et al. 2017), which were translated into national competence frameworks for pupils and teachers[2]. These frameworks create the basis for the integration of competency-oriented teacher education in digital literacy. Nevertheless, TALIS 2018 showed that a significant number of teachers express the need to develop their competencies regarding the use of digital technologies and only 43% of teachers felt they were well prepared to teach digital competencies in class. These figures show that teachers continue to need professional development opportunities to foster their competencies and self-efficacy in teaching digital literacy. In addition, as technological developments rapidly move forward, teacher education will need to keep pace with the changing digital landscape.

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[1] In the context of this Syllabus, we follow the definition of sustainability proposed by "GreenComp: The European sustainability competence framework" that states: "Sustainability means prioritising the needs of all life forms and of the planet by ensuring that human activity does not exceed planetary boundaries" (Bianchi et al. 2022, p. 12).

[2] Again as an example: In Germany, there are national guidelines like the"Kompetenzen in der digitalen Welt" (translated by the author: competences in the digital world) published by the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder (available online: https://www.kmk.org/fileadmin/veroef-fentlichungen_beschluesse/2021/2021_12_09-Lehren-und-Lernen-Digi.pdf) and guidelines by the Länder, e.g., the "Orientierungsrahmen für Lehrkräfte in einer digitalisierten Welt" (translated by the author: Orientation Framework for Teachers in a Digitalised World) that is specific to Northrhine-Westphalia (available online: https://www.medienberatung.schulministerium.nrw.de/_Medienberatung-NRW/Publikationen/Lehrkraefte_Digitalisierte_Welt_2020.pdf).

1.2 What is TESTEd? A brief introduction to the project

TESTEd addresses the need for European teachers and teacher educators to work together and broaden their perspectives to find common solutions for challenges in implementing cross-cutting issues into classroom practices.

The project "TESTEd — Towards a European Syllabus in Teacher Education. Facing future challenges together" was conceived with the idea in mind that education systems and especially teachers across Europe all face the same current, global challenges — often on a daily basis. Therefore, these challenges require international responses in teacher education to find and establish widely accepted European solutions. As education is still organized on a national or even federal level with little systematic international influences on school systems, there is a huge need for (pre-service) teachers to become familiar with other European education systems, classroom habits, organizations, and subject-related practices as only they can transport a truly European perspective on education. The project, therefore, wants to explore how different European countries deal with and maybe even solve some of the challenges, to offer teacher educators — and by extension pre-service and in-service teachers — insights into the knowledge, skills and attitudes needed to teach cross-cutting issues in class and provide good-practice examples from European classrooms and universities.

To this end, we formed a consortium in June 2022 with five universities and a CPD provider as well as 11 schools, and critical friends (education administrators, government representatives, teachers' unions, and other stakeholders) as associated partners from central, north, and southwest Europe (see figure 1).
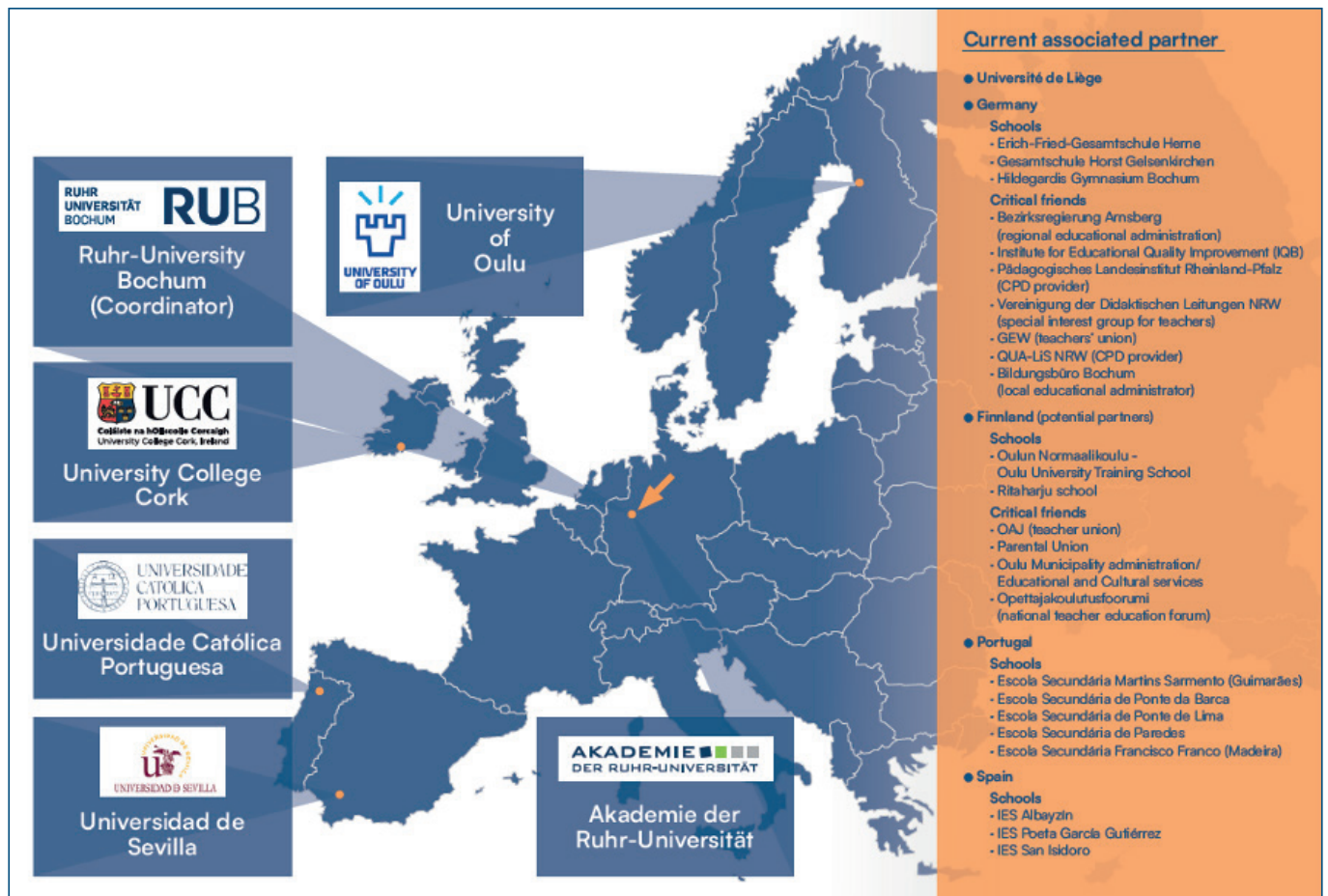

Figure 1: Overview of the TESTEd consortium

In this consortium, we set ourselves the following main goals:

- To bring a European perspective to teacher education and school development via a European Syllabus in Teacher Education and the establishment of international communities of practice between pre-service teachers, in-service teachers, teacher educators and other stakeholders in education.

- To further pre-service teachers' and in-service teachers' knowledge and skills concerning the cross-cutting issues by providing virtual exchange seminars and CPD courses with a multiplier training during our project.

- To increase the quality and attractiveness of the European Higher Education Area (EHEA) through high-quality, international teaching and learning offers in initial teacher education by implementing the European Syllabus.

- To establish and strengthen emerging research networks between the participating universities through joint publications and to support early career researchers through student research exchanges.

- To enable knowledge transfer to a wider audience in the field of teacher education and schools as well as to ensure a sustainable documentation and future scalability of the project results.

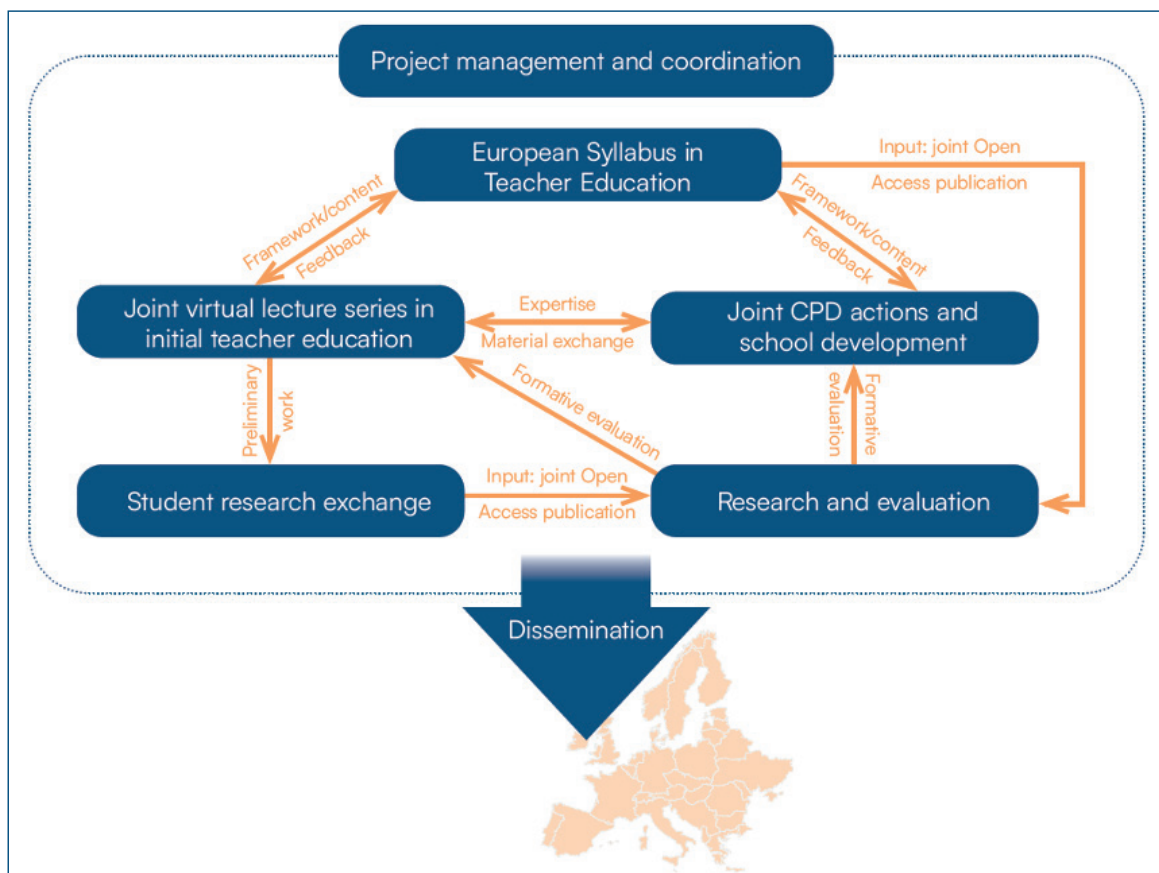These goals were translated into seven work packages (see figure 2).

Figure 2: Overview of the work packages in TESTEd

In the following sections, we will discuss both the development of the European Syllabus and its first implementation in a virtual exchange lecture series in initial teacher education in depth. We will also present the first results from a formative evaluation of the lecture series and discuss lessons learned for its second implementation. Finally, we will outline the next steps for the project— including the development of a CPD course based on the European Syllabus.

2. The development of the European Syllabus in Teacher Education

Frameworks for teaching cross-cutting issues on a national and European level are often targeted towards student competencies and classroom content. To enable teacher educators to provide high-quality competence-based (continuous) professional development, it also requires a Syllabus showcasing which competencies teachers must acquire to teach cross-cutting issues effectively.

The delivery of the European Syllabus in Teacher Education is the main objective of the TESTEd project. The Syllabus itself is conceptualized as a systematic framework for the inclusion of societal challenges in initial and in-service teacher education. It focuses on the following five cross-cutting issues:

- ESD

- Democratic education and active citizenship

- Gender diversity and equality

- Multilingual classrooms

- Digitalization of learning spaces

The Syllabus introduces these cross-cutting issues — defining main concepts and relating them to the work of teachers — before presenting key emerging topics for each of the issues (see table 3, section 2.1). It then presents competencies, (pre-service) teachers should acquire to be able to teach these topics in classrooms, concentrating on the required knowledge, skills, and attitudes. Furthermore, the Syllabus will give concrete good-practice examples from the partner countries to showcase approaches to teaching cross-cutting issues in classrooms. The Syllabus is, thus, targeted at teacher educators, but should also provide practical guidance to teachers themselves, who might not have the resources to participate in extensive teacher training.

2.1 The work process — arriving at a first draft

Subject-based teacher education and school curricula pose a major problem to meaningful implementation of the cross-cutting issues, as only interdisciplinary collaboration could address their complexity and far-reaching impacts fully.

The conceptualization and creation of the Syllabus is coordinated by the University of Oulu, Finland. Nevertheless, all partners provide input, deliver texts, and give feedback to the Syllabus to make it a truly European endeavour.

We started working on the Syllabus in the summer of 2022. First, all five partner universities prepared comprehensive overviews of current national guidelines and curricula concerning the cross-cutting issues, also giving an extensive list of official policies with short English summaries. As these national guidelines were often related to pupils' competencies and classroom content, the next step was to extrapolate what competencies teachers would have to acquire to be able to effectively support competency development in their pupils. We, therefore, had to take a step back to develop a first Syllabus structure for teacher educators.[3]

The first structure was developed by the University of Oulu. Carrying out a document analysis looking at EU directives, like DigiComp 2.2 (Vuorikari, Kluzer and Punie 2022) and GreenComp (Bianchi, Pisiotis and Cabrera Giraldez 2022), Oulu examined whether the national documents were aligned with EU directions and which key topics and competencies were detailed for pupils and — if available — teachers. In total, Oulu reviewed 25 documents on the European level — published mainly by the European Commission and the Council of the European Union (see table 1). Furthermore, they carried out research to include international research papers on the cross-cutting issues.

Table 1: Number of documents reviewed (2022)

Cross-cutting issue	European Commission	The Council of the European Union	Other	Total no.
Education for sustainable development	3	0	2 [4]	5
Active citizenship and democratic education	0	6	0	6
Gender diversity and equality	1	0	1 [5]	2
Multilingual classrooms	2	2	0	4
Digitalization of learning spaces	6	1	0	7
Total no.	11	9	4	25

[3] There are some notable exemptions like the European Commission's DigCompEdu (Punie et al. 2017) and the European Council's publication "How all teachers can support citizenship and human rights education: a framework for the development of competences" (2009, available online: https://rm.coe.int/CoERMPublicCommon-SearchServices/DisplayDCTMContent?documentId=09000016802f726a, last checked 5 October 2023) which we included in the Syllabus. Furthermore, we included scientific publications if possible, e. g.: Nguyen, L. A. T., & Habók, A. (2023). Tools for assessing teacher digital literacy: a review. In: Journal of Computers in Education, 1-42.

[4] Wiek, Withycombe and Redman (2011) and Brundiers et al. (2021).

[5] European Institute for Gender Equality (EIGE, Online: https://eige.europa.eu/gender-mainstreaming/policy-areas/education, last checked 22 September 2023).

As we did not only want to rely on already existing European frameworks but also wanted to include novel and forward-looking topics that might just emerge on the educational landscape, we followed up the document analysis with an expert survey.[6] We contacted known experts for the five cross-cutting issues from all five partner countries to participate in an anonymous online survey — 53 experts responded. These experts included university lecturers in teacher education, researchers in the educational sciences and subject didactics as well as long-time practicing teacher educators. The experts were distributed across the five cross-cutting issues with the highest number of participants in the field of multilingualism and the fewest in gender diversity (see table 2). All of them were asked the following open-ended question:

> In the field of [selected field of expertise responding to the cross-cutting issues], what are emerging or current key issues[7] in the context of teacher education in your country or beyond? Please specify.

To complete the survey, all experts were given the option to respond in English or their mother tongue to not pre-emptively exclude responses due to language barriers.

Table 2: Participant distribution across the cross-cutting issues

	n	Percent
1. Education for sustainable development (ESD)	19	35.8 %
2. Democratic education and active citizenship	14	21.4 %
3. Gender diversity and equality	13	24.5 %
4. Multilingual classrooms	21	39.6 %
5. Digitalization of learning spaces	19	35.8 %

The expert responses were analysed using a summary content analysis and linked to the already existing emerging topics from EU and national guidelines. Based on these two data sets, we then structured the emerging topics included in the European Syllabus (see table 3), focussing on the topics that (a) were mentioned the most frequently and aligned with current discussions on the cross-cutting issues, (b) were aligned with EU policy and (c) were realistic for implementation in schools.

Table 3: Overview of the emerging topics for each of the cross-cutting issues (topics in italics were later additions to the Syllabus based on expert and practioners' feedback)

Cross-cutting issue	Emerging topics		
ESD	Complexity as part of sustainability	Bridging the knowledge-action-gap	Envisioning possible sustainable futures
Democratic education and active citizenship	Democracy under threat	Human rights and peace education	*Active citizenship in communities*
Gender diversity and equality	Diversity of gender identity and sexual orientation	Promoting equality among genders	
Multilingual classrooms	Teaching linguistically responsive content-curricula	Heritage language support at school	Trauma informed teaching
Digitalization of learning spaces	Re-thinking education with AI	Data literacy	*Digital wellbeing*

In an iterative writing process, the task force from Oulu University then started to write the Syllabus, receiving input, feedback, and comments from the other university partners. A first Syllabus structure was presented to and discussed with Civil Society Organizations (for example CSOs in ESD and LGBTQIA+ rights) as well as European teachers from our partner schools in January 2023 and our critical friends in an advisory board meeting in March 2023, to ensure quality and a good fit to teachers' needs from the beginning.

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[6] Another reason for the inclusion of the expert survey was that the topic "gender diversity and equality" was not as prominently represented in EU directives and national guidelines. We, therefore, wanted to include additional expertise on this subject.

[7] In the context of this survey, we defined key issues to our experts as "topics or phenomena of pressing importance that should be included in a forward-looking teacher education".

2.2 Key Challenges

The lack of structural support for teachers participating in in-service teacher training poses a challenge, as teachers express the need for CPD courses in teaching and especially assessing cross-cutting issues in classrooms.

During the research and writing process, there were several key challenges that we would like to highlight in this paper. First, the cross-cutting issues are highly complex and multifaceted. This makes it difficult to implement them in teacher education and schools, where content is much more compartmentalised. Meaningful implementation of the issues would require addressing and dealing with their complexity, but acknowledging their complexity fully is a major barrier to their meaningful implementation, either because the required interdisciplinary approach does not fit subject-oriented teacher education and school curricula, or because schools do not provide enough support, resources, time, or opportunities for multidisciplinary collaboration between teachers. We decided to address this challenge by including good practice examples in the syllabus, highlighting how teachers can implement the cross-cutting issues in their specific subjects. As this is a solution that works with the constraints rather than challenging them, we hope that the syllabus will have a more immediate impact on teacher education. However, supporting widespread interdisciplinary and cross-curricular teaching practices that provide opportunities for teachers to work phenomenon-based would promote the implementation of the cross-curricular issues in a more meaningful way.

A related challenge is the lack of suitable methodology and assessment tools, both for schools and in teacher education.

> Learning, teaching and assessment are closely intertwined and any policy or strategy which impacts one of these elements will also affect the others. This means that decisions made in relation to assessment have a major influence on how the key competences are taught, and therefore, on what learners learn. (European Commission, Directorate-General for Education, Youth, Sport and Culture 2019, p. 16)

It is, thus, vital to equip teachers with suitable teaching methodology and assessment strategies for teaching the cross-cutting issues. As the issues are highly complex and are often linked to a change in attitudes and actions, it is recognized that teaching methodology and assessment should not be confined to school walls. Instead, teaching these cross-cutting issues should encourage pupils to become more active in their communities. Therefore, traditional assessment tools seem insufficient to evaluate learning that is interdisciplinary and should bridge a knowledge-action gap. This lack of common frameworks for assessment also translates into concerns regarding quality assurance of teacher education programs that aim to equip teachers with the necessary competencies to include these issues in their teaching practices. To support teachers in implementing the delivery of the cross-cutting issues, the Syllabus will showcase adequate teaching methodologies combined with good-practice examples.

Another challenge we would like to address is the lack of incentives for teachers to shoulder the workload linked to the teaching of interdisciplinary, intersectoral cross-cutting issues. Even though political support for the inclusion of the cross-cutting issues on an EU and national level in the countries participating in TESTEd is expressed through i. e. policy documents on the European Education Area (EEA), in school curricula and competency frameworks for students, the political will often does not reach the classroom because it does not tackle infrastructural problems or provide teachers with more time or resources. Furthermore, as TALIS 2018 shows, there is a need for CPD courses, which enable teachers to include and assess these cross-cutting issues in their classrooms (see chapter 1.1). However, even though CPD is a professional duty for teachers in almost all European countries (Eurydice 2021, p. 92),[8] there is often little structural support for teachers to participate in in-service training. Thus, they have to invest their own time and resources in professional development:

> Around half of teachers and principals report that participation in professional development is restricted by schedule conflicts and a lack of incentives to engage in these activities. While support mechanisms in some TALIS countries and economies are associated with higher participation rates, in other contexts, the support still seems insufficient. (TALIS 2018: Online publication)

In TESTEd, we try to meet the need for CPD in the cross-cutting issues by implementing the Syllabus not only in initial teacher education but also in a CPD course for in-service teachers (see also section 4). Furthermore, we are mindful of conflicting work schedules and limited amounts of time for teachers. Therefore, our CPD course takes place in the afternoon to work around teaching hours and combines synchronous and asynchronous elements to provide diverse input. It will — furthermore — offer flexible paths of participations, adapting to teachers' needs, interests, and constraints as well as open-office sessions with experts in the field to freely talk about individual questions and seek direct advice.

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[8] Exceptions are Denmark, Ireland, the Netherlands, Norway, and Turkey where teachers are not statutory obliged to participate in CPD (European Commission et al. 2021, p. 92).

2.3 The current structure of the Syllabus

To support teacher educators as well as teachers already working in the field, the TESTEd Syllabus includes a competency framework for each of the cross-cutting issues as well as good practice examples from classrooms to value high-quality work done by teachers all over Europe and directly support the implementation of the cross-cutting issues in teaching practices.

In accordance with the experts' and practitioners' feedback as well as being mindful of the key challenges mentioned, the Syllabus is now structured as follows.

Chapter 1 introduces the Syllabus. It presents its' background, terminology used as well as a guide on how to use the Syllabus. As the Syllabus is directed towards both teacher educators, and teachers, it includes guidance to lead these different target groups to the parts of the Syllabus that are the most relevant for them, thus enhancing its readability and user-friendliness.

Chapters 2 to 6 then discuss the cross-cutting issues. These chapters follow the same basic structure, first introducing the main concepts of the cross-cutting issues and then detailing the emerging topics (see table 3, chapter 2.1), defining their scope and relating them directly to teachers' work, highlighting the gap between current practices and needs. The chapters then each include a list of competencies that teachers should acquire to teach the specific cross-cutting issue. The competencies focus on (a) knowledge and understanding of the cross-cutting issue, (b) skills for teaching the cross-cutting issue and (c) attitudes towards the cross-cutting issue (adapted from Mohamed, Valcke & De Wever 2017; European Commission 2019; see also figure 3).

Teacher competency structure

Knowledge and understanding of the CROSS-CUTTING ISSUE

- Aims and purposes of the CROSS-CUTTING ISSUE
- Content knowledge related to the CROSS-CUTTING ISSUE
- Key international frameworks and principles that relate to the CROSS-CUTTING ISSUE
- National curricula that relate to the CROSS-CUTTING ISSUE
- Different possible contexts of learning the CROSS-CUTTING ISSUE

Skills for teaching the CROSS-CUTTING ISSUE

- Planning of approaches, methods, and opportunities for learning about the CROSS-CUTTING ISSUE
- Incorporating principles of the CROSS-CUTTING ISSUE and practices into one's own teaching
- Establishing ground rules and sustained environment for learning the CROSS-CUTTING ISSUE
- Developing a range of strategies to facilitate learning the CROSS-CUTTING ISSUE
- Use of a range of approaches to assessment of the CROSS-CUTTING ISSUE

Attitudes towards the CROSS-CUTTING ISSUE

- A sense of self-efficacy concerning the CROSS-CUTTING ISSUE
- Professional beliefs, including learning, teaching, and pedagogy on the CROSS-CUTTING ISSUE
- Motivation and interests in developing own teaching for the CROSS-CUTTING ISSUE

Figure 3: Info box on basic competency structure employed in the Syllabus

Going one step further, each chapter then includes methods for teaching the emerging key topics as well as good practice examples for teachers. A glossary and overview of literature ends the Syllabus.

A first version of the Syllabus was implemented in initial teacher education in the international joint lecture series that focussed on the five cross-cutting issues and was supported by lecturers from all five participating universities.

3. The joint international lecture series in initial teacher education

To strengthen the European perspective and international discussions on the cross-cutting issues in initial teacher education as inclusively and broadly as possible, virtual mobility and internationalization at home must be central.

The first joint international lecture series was held in the summer semester of 2023 and attended by pre-service teachers from all participating universities. At the end of the lecture series, University College Cork conducted the first hybrid, international maker space in which teacher students, lecturers, and in-service teachers worked together to create Open Educational Resources (OER) based on the lecture series.

The lecture series and maker space were targeted at students in initial teacher education and the educational sciences (pre-service teachers) and developed with the following goals in mind:

(1) to strengthen the European dimension in teacher education and increase the quality and attractiveness of initial teacher education through a strong international dimension

(2) to further pre-service teachers' skills and employability

(3) to support internationalization at home

(4) to establish communities of practice between international pre-service teachers

To accomplish these goals, we started to develop the lecture series in a joint approach with the University of Braga taking on the main responsibilities as work package coordinator with support from the University of Sevilla.

As we wanted to focus on a European dimension in teacher education, the lecture series involved lecturers and pre-service teachers from all participating countries. Content was delivered in English, the lingua franca of all participants. The lecturers took the cross-cutting issues and the topics from the developed European Syllabus and translated them into synchronous and asynchronous sessions as well as tasks for the participating pre-service teachers. The synchronous sessions were held via virtual exchange to support internationalization at home and provide inclusive opportunities for virtual mobility for a broad number of students. To support debates and the formation of communities of practice, the synchronous sessions all included group discussions and tasks to allow for exchanges between the pre-service teachers. Also, the hybrid maker space was designed to encourage interaction between students on a national and international level.

The following sections will go into further detail on the lecture series and the hybrid maker space, showcasing the topics discussed, lessons learned as well as a first look at the formative evaluation.

3.1 Organizing a virtual exchange seminar with five universities

Even though, teacher students see the need for the cross-cutting issues and overwhelmingly enjoy international discussions with other European students, the inflexibility of university curricula and guidelines in initial teacher education poses significant challenges to virtual and hybrid exchange seminars.

The lecture series started with five synchronous lectures held in April and May 2023, with each cooperating university delivering input or acquiring a lecturer in their field of expertise.

- „Democratic education and fostering active citizenship: (de)constructing what we (think) we know about the world" — Amanda Franco (Universidade Católica Portuguesa, Porto)

- "Gender Equality at School Provides a Better Learning and Teaching Environment and Better Results" — Patricia Álvarez Sánchez (University of Málaga)

- "A Dynamic Pan-Disciplinary Framework for Integrating Concepts of Sustainability across the Curricula" — John Barimo (University College Cork)

- "Digitalisation of learning spaces" — Jari Laru (University of Oulu)

- "Teaching in multilingual classrooms" — Björn Rothstein (Ruhr-University Bochum)

All the sessions were recorded and professionally edited. The videos were then made available online for future reference and use, e.g., in the CPD courses for in-service teachers.[9]

The lecture series was supported with the Learning Management System (LMS) Moodle, on which students could find further material. Each lecturer also prepared an asynchronous learning session for his/her topic with a task to be completed at the end of the asynchronous learning phase. These were also uploaded and graded via Moodle.

The lecture series was announced by each partner university and credited with 2-3 ECTS[10]. The accreditation of the lecture series was a general challenge in our first implementation, as the university modules differed widely and are highly inflexible in initial teacher education. Thus, it was difficult to find a fit for the seminar in the course structures of each university. The universities of Braga and Cork, thus, had to rely on accreditation by the University of Oulu to make sure their students received 3 ECTS for course participation. Moreover, the students from Sevilla received less credit points for the same amount of work than the other participating students.

The inflexibility of university curricula in initial teacher education is typically one of the main limitations when discussing the inclusion of cross-cutting issues in teacher education and interdisciplinary virtual exchange. In all European countries, initial teacher education includes subject education as well as pedagogical education, often leading to full university curricula with little room for the inclusion of new, cross-curricula seminars.[11] In our first implementation of the lecture series, we, therefore, had to compromise on the accreditation of the seminar. To remedy this challenge, we started early preparations for accreditation in the lecture series second implementation.

The different semester times also posed a problem, as there was no prolonged overlap between the different university terms. In Germany, the summer semester regularly starts around mid-April and seminars end mid-July, whereas in the other participating countries, the semester ends at the end of April with an exam period in May. With the inclusion of asynchronous and synchronous phases, we were, however, able to broadly fit the semester schedules and not over-impose on the students' exam times in May.

In the end, 35 students from all five participating universities completed the lecture series (see also table 4).

Table 4: Overview of students completing the lecture series 2023 per university

University	No. of students
Ruhr-University Bochum (RUB)	13
Universidad de Sevilla	11
University of Oulu	5
University College Cork	3
Universidade Católica Portuguesa (Braga)	3

However, there were notable differences between the number of students from Bochum and Sevilla compared to the number of students from Braga, Cork, and Oulu. This might be due to different semesters and seminar registration schedules at the participating universities, fewer students seeking training in the field of teaching, and initial difficulties with accreditation of the lecture series in Braga and Cork, which might have dissuaded students from joining.

3.1.1 Lessons learned

To avoid these difficulties, the next lecture series will be structured to fit the different semester times better and offer a more compact experience. This means, the asynchronous material will be available earlier in preparation of the synchronous sessions, as we want to make sure that the lecture series fits semester times in Oulu, Braga, and Cork. Nevertheless, students from Bochum, whose semester only starts in April, have time to finish tasks from the lectures until later in the semester. Also, promotion will be tailored closer to the different universities' and students' needs, to attract higher numbers of students. We will also start promotions from October 2023 onwards to make sure all information about the lecture series is widely disseminated across the five different campuses.

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[9] Available online: https://tested-network.eu/oer/
[10] Only Sevilla credited the lecture series with 2 ECTS.
[11] In a study, the German Academic Exchange (2023) examined conditional factors of pre-service teacher mobility, pre-service teachers saw the loss of time during their studies as well as problems with the recognition of academic achievements as main factors for not going abroad during their university studies (p. 22). Furthermore, pre-service teachers criticise these problems more frequently than other university students, pointing towards inflexible curricula and course work limiting their mobility opportunities (ibid.).

One of the major lessons learned was to start the accreditation process at the different universities at an earlier date, as internal accreditation is of high importance to the participating students. However, as there were obstacles for some of the universities, we will continue to accredit the lecture series according to the different institutional guidelines and limitations.

Further lessons learned from the first lecture series were as follows:

- It was decided to streamline the different lectures and provide information for all participating lecturers, e. g., on technical equipment needed, student participation, set tasks or the LMS: We will provide detailed guidelines and an info session before the start of the lecture series. All lecturers will also be asked to standardize their tasks and the task assessment.

- To further strengthen the international perspective in the lecture series, we will ask lecturers to emphasise on good practice examples from their countries in the scope of their session and provide links or material for Moodle.

- The asynchronous lectures will serve as a preparation for the synchronous lectures and will — already — include preparatory tasks for student groups.

- In the synchronous lectures, lecturers will focus more strongly on assembling international groups with students from each country for the break-out sessions.

- Discussions in national student groups will also be included with specific tasks on surveying local institutional realities in relation to the different cross-cutting issues from the students' point of view.

- The lecture series will be linked more closely to the maker space, by assigning research tasks for the maker space during the lectures and following a challenge-based approach in the lecture series and the maker space.

3.1.2 Formative evaluation of the lecture series

Apart from the lessons learned, the lecture series was also evaluated using a questionnaire with a pre-/post-design and self-declared information from the participating students. Approximately one-third of students filled in the survey (n=13). As the sample size was quite small, we did not include socio-demographic information to make sure students remained anonymous.

First, we wanted to gather evidence on students' perceived increase in knowledge. Therefore, we asked students before and after the lecture series how much they felt they knew about the five cross-cutting issues. The students rated their perceived knowledge on a Likert scale with (1) meaning 'nothing' and (5) expressing expert status.
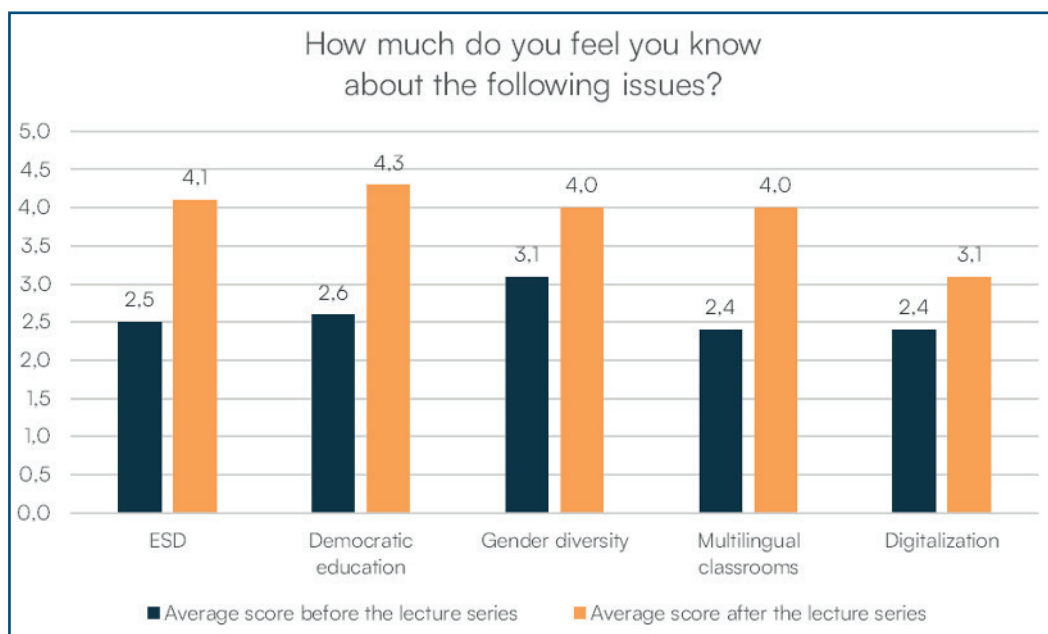

Figure 4: Average scores on perceived knowledge before and after participating in the lecture series 2023

The survey data shows a perceived improvement in knowledge, with the biggest knowledge gain in the cross-cutting issue "democratic education and active citizenship". This cross-cutting issue alongside "ESD" was also often named by students when asked which cross-cutting issue they perceived to be most pertinent to their future work.

However, these results are, of course, only a little indicator of the actual knowledge the students gained. First, it must be stressed that this data is self-reported, so it might not match the actual knowledge improvement and could also be influenced by social desirability, even though the survey was anonymous. Furthermore, only a small number of students filled in the questionnaire. Thus, these scores can only be seen as a first indication concerning the improvement of pre-service teachers' skills.

To also get an insight on the perceived quality of the lecture series we asked students to rate the seminar using a Likert-scale from 1 (strongly disagree) to 5 (strongly agree):
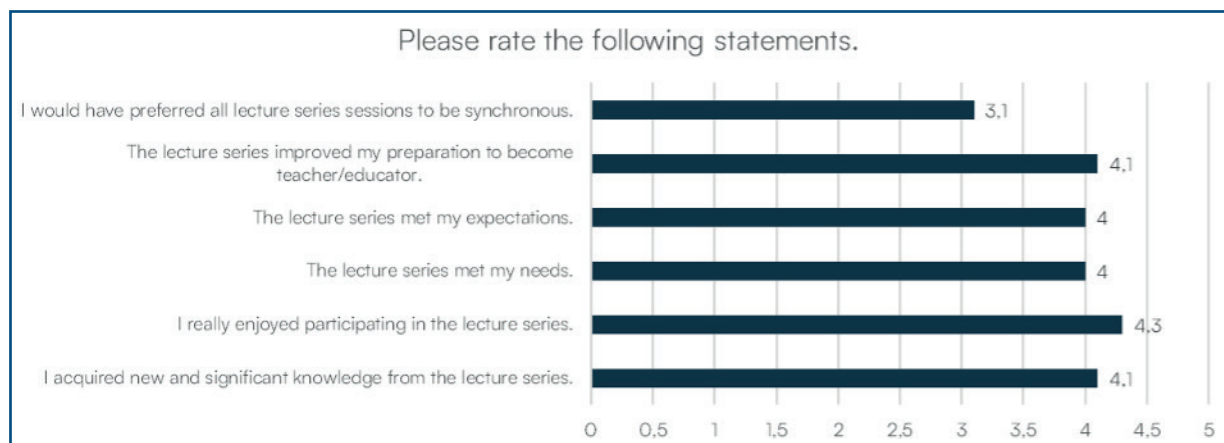

Figure 5: Student assessment of the lecture series 2023

The responses show a very positive attitude towards the lecture series: The pre-service teachers overwhelmingly enjoyed taking part in the seminar and enjoyed the discussions with international students and lecturers and the diverse perspectives these people brought to the cross-cutting issues the most. Additionally, pre-service teachers praised the quality of the lecturers and the selection of topics.

Nevertheless, there were also suggestions for improvement: Pre-service teachers stated that they would have wished for a stronger focus on equity and social justice in education and more practical examples, especially regarding the use of digital tools and AI in classrooms. It was also suggested to provide materials earlier in advance, involve people outside of academia and forge a stronger link between the lecture and the maker space. Furthermore, it was suggested to organise the lecture series as a hybrid seminar from the beginning so that participants from the same university could already meet during the lecture series.

3.2 The hybrid international makerspace in Cork

(Pre-service) teachers need space and detailed support so that the transfer of knowledge from (university/CPD) courses to the classroom can succeed.

The maker space was held at University College Cork campus from 22nd to 26th May 2023. It was designed to encourage pre-service teachers:

- to participate in hands-on design and arts thinking approaches to problem-based learning,
- to seek to understand the 'on the ground' experiences of teachers in the classroom regarding and implementation of the cross-cutting issues into curricula,
- to develop OER to the cross-cutting issues for use within the classroom for teaching and
- to learn from others across the network.

One lecturer from each participating university travelled to Cork to help in the coordination of the maker space and encourage international exchange. As the maker space focussed hybrid mobility, it, however, not only took place in Cork but also in 'satellite' locations in Oulu, Sevilla, Bochum, and Braga who joined the maker space via MS Teams and provided space and resources to their participating students on-site.

The week was devoted to the question "How Might We Develop Educational Resources for Teaching the Cross-Cutting Issues?" and followed a design-thinking approach, utilising the Hasso-Plattner (2018) method. Additionally, Lego Serious Play was used to encourage visualisation around the five cross-cutting issues and help participating pre-service teachers to think creatively about possible OERs. Two lightning talks about design thinking and curriculum development were given to introduce students to the methodology and present first ideas for OER. The lightning talks also focussed on the cross-cutting issues of ESD and gender sensitivity to provide pre-service teachers with concrete references for their later work.

All locations also hosted local in-service teachers in the maker space to help give the pre-service teachers insights into the classroom realities of teaching the cross-cutting issues at schools and support the creation of communities of practice across all levels of teacher education. The pre-service teachers interviewed the in-service teachers and summarized the results in an empathy map. These summaries were then used on the second day to guide pre-service teachers in their OER creations. Apart from in-service teachers and lecturers, a graphic illustrator, Maia Thomas, and a local artist, Alex Pentek, were also invited to the maker space to help students with their creative endeavours.

In the end, the students held pitch presentations showcasing their OER. Results of the pitch presentations were graphically recorded by Maia Thomas (see figure 6). Moreover, students were asked to create short 3-minute videos on their OER to introduce their artefacts and describe how their material might be used in classrooms.

Figure 6: Graphic recording of pitch presentations by Maia Thomas (Cork)

The makerspace was again evaluated using a survey completed by participating pre-service teachers. Key takeaways from the survey were:

- Students reported increased knowledge of all five cross-cutting issues.
- Students would prefer to work with international colleagues more often.
- Students prefer interactive and creative activities, like the Lego Serious Play method and the creative exercises with the artists.
- Students found the methodology of design-thinking helpful in creating OER.
- Students gave positive feedback on the working atmosphere and interactions during the maker space.
- Students generally enjoyed the experience.

However, the participating students also criticised that some tasks were not clearly given from the beginning, reducing their time for OER creation. Furthermore, they proposed a clear connection between the lecture series and the maker space to outsource some of the stages in design-thinking to the seminar phase. The pitch meetings also ranked lowest in terms of relevance and enjoyment in the survey, suggesting the need for more scaffolding during the lecture series and maker space event.

From this evaluation, we took the following ideas for the development of the next maker space in May 2024:

- communicate the overall aim and outcomes to the students at the beginning of the lecture series,

- provide more scaffolding and clearer deadlines from the beginning,

- include the evaluation of good-practice teaching material in the lecture series to provide students with ideas for their OER creation,

- possibly include some physical mobility for teachers and teacher students to attend on site (rather than virtually) in order to support a stronger foundation for international communities of practice.

4. Next steps in TESTEd and concluding remarks

With a common EEA, the European Commission is aiming for a more inclusive education that provides equal opportunities for all students and sets a path for Europe's green and digital transition. The European Commission aims to achieve the EEA by 2025 — while also pointing to international teacher surveys which „show that a significant number of teachers express the need to develop their competencies for teaching pupils with special needs, for using digital technologies and for teaching in multilingual and multi-cultural classrooms" (European Commission 2020, p. 10).

The scope and impact of the cross-cutting issues on education and teaching practices highlight the significance of international co-operation between teachers, teacher students and teacher educators across Europe. Through European approaches and mobility, we can widen the access to high-quality teaching approaches and foster understanding in diverse classrooms. We can learn from each other's good practices in intersectoral and interdisciplinary communities of practice and find common solutions for the EEA.

However, current structural problems pose systematic challenges to international communities of practice. Subject-based teaching practices and little resources and time for multidisciplinary work or phenomenon-based teaching across the curriculum limits teachers in the implementation of the cross-cutting issues — especially ESD. The inflexibility of curricula also expands to initial teacher education, making it difficult to integrate further topics parallel to existing subject and pedagogical courses. The tight schedules at universities also restrict pre-service teachers' mobility. For example, the German Academic Exchange Service just released a study showing that teacher students are less mobile than university students who do not study to become a teacher with the difference being strongest for students studying in Master of Education programmes (DAAD 2023, p. 11).[12] In-service teachers also see their full schedules and heavy workload as the main reason for not attending CPD courses (TALIS 2018). To effectively integrate cross-cutting issues into (initial) teacher training and support international communities of practice in the field of education that include teachers and pre-service teachers, it, thus, needs:

(a) less restricting curricula in universities and schools to free up time for the implementation of new, challenging, and interdisciplinary topics,

(b) resources and structural support for teachers to attend CPD courses as well as

(c) time in which teachers can work on the transfer from the courses to their classroom, work in multidisciplinary teams and share their good practices with other teachers.

The TESTEd network is working towards the inclusion of the transversal issues in pre-service and in-service teacher education. Based on the lecture series, expert, and practitioners' feedback, we are currently working on revising and expanding the Syllabus (see also additional emerging issues, table 2). The Syllabus' revision will also consider evaluations and feedback from the student research exchange, and the CPD course. Furthermore, CityLabs and roundtable discussions are being planned inviting further feedback on the Syllabus from various stakeholders in the educational landscape. By incorporating feedback from a wide range of addressees, we want to increase the connectivity of the Syllabus and respond to the needs of in-service and pre-service teachers

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[12] DAAD (2023). Merkmale und Bedingungsfaktoren von Auslandsaufenthalten im Lehramtsstudium — Auswertung der Lehramtsdaten aus dem Projekt „Benchmark internationale Hochschule" (BintHo), available online: https://static.daad.de/media/daad_de/pdfs_nicht_barrierefrei/der-daad/analysen-studien/2023_arbeitspapier_bintho_lehramt_fin.pdf (last checked 16 October 2023).

more appropriately. We, therefore, also conceived the Syllabus as a dynamic document from the beginning of the project to be able to respond to (future) teachers' needs, new emerging issues, as well as to integrate further good-practice examples over the project's runtime and beyond.

After the first implementation of the Syllabus in initial teacher education, we now also developed a CPD course for European in-service teachers. In the CPD course, teachers from the participating countries will come together to receive information about the cross-cutting issues, exchange teaching practices and discuss good-practice examples. It is structured in three phases with synchronous and asynchronous learning elements:

(a) a more theory-based, international phase, in which international teachers come together, learn about, and discuss the cross-cutting issues.

(b) a transfer phase, focussing on nation (if applicable Länder) specific regulations and curricula and concrete lesson plans and material. In-service teachers will be asked to carry out a learning module based on the European Syllabus at their schools and reflect on their experiences.

(c) An international multiplier training to support teachers in transporting ideas from the CPD course into their schools. As multipliers, the in-service teachers will promote school development and act as European beacons.

The CPD courses' kick-off was on 27th September 2023 and the duration of the course is set until 13th March 2024. In the beginning, over 50 teachers registered from Ireland, Finland, Germany, Spain, and Portugal, showcasing the importance of these issues to in-service teachers. The CPD course will also be evaluated — with a questionnaire in a pre-/post-design as well as through focus group discussions. Responses from the evaluation will again be integrated into the Syllabus.

Parallel to the CPD course, TESTEd also started its student research exchanges. Students who participated in the international lecture series and the maker space event are offered the possibility to write either their thesis or a research paper at one of the partner universities in the consortium on aspects of ESD, democratic education, gender sensitivity in teaching and learning, multilingualism, or digitalization from a European perspective and under binational supervision. Students applied for a mobility grant and the selection process to place in early summer with a selection committee consisting of project leads from all participating universities. During their stay abroad, students will be placed at a participating training school to conduct their research. The best research papers will then be published to disseminate the results to a broader audience.

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