Universiteit Leiden

Special Interest Group SIG

The Leiden University Guide To

Transdisciplinary Education

This document is created by Leiden Learning and Innovation Centre (LLInC) and the Leiden University Honours Academy.

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Introduction

Welcome! This guide aims to help teachers and course coordinators to (re)design a transdisciplinary course. With the increasing popularity and institutionalisation of transdisciplinary education (and research[1]), the Leiden University Honours Academy and the Leiden Learning and Innovation Centre (LLInC) have created this practical resource to help you get started with this contemporary type of education. It provides tips, templates, and examples of teaching materials, based on best practices from across Leiden University and beyond. All the tools suggested or included within this guide are free to adapt and use in your own teaching. Since this short guide may not do justice to all the variations and intricacies involved in this exciting type of education, we have also included links to some of the pioneers within Leiden University. We encourage you to reach out to others to learn more in personal conversations so that we can begin to build a network around this topic.

Since we are all learning, this guide is intended as an evolving document. Please contact us with any remarks or suggestions to ensure that it remains updated and relevant.

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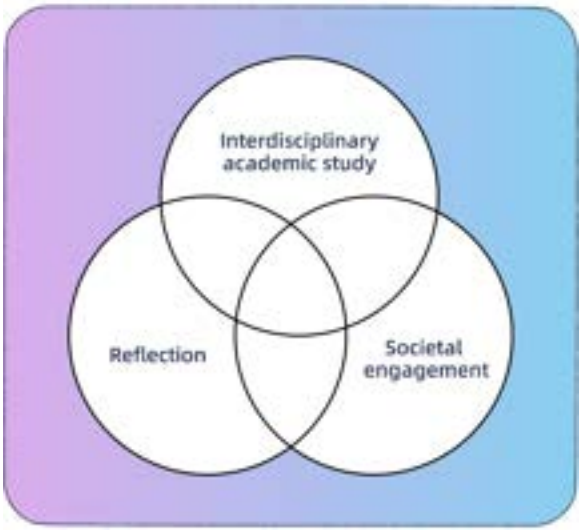
Definition

Transdisciplinary education: What is it?

Transdisciplinary education refers to learning experiences which involve equitable co-creation with societal partners and which focus on tackling local, context-specific problems. In a transdisciplinary course, students work (in groups) on a project which is designed together with a societal partner, such as a municipality, NGO, or private company. When it comes to gathering knowledge as well as designing solutions and advice, insights from stakeholders, relevant organisations, citizens, and interviewees are just as important as academic knowledge.

Transdisciplinary Education



A transdisciplinary course often has three core elements:

1	An interdisciplinary academic component, in which a complex/layered problem is analysed from multiple perspectives.
2	A societal-engagement component, in which students work on a real-life challenge put forth by - and typically co-created with - a societal stakeholder.

3	A reflective component which enables students to integrate their learning across different disciplinary and real-world contexts. This component ought also to prompt consideration of their own roles and perspectives in addressing societal challenges.

In these ways, transdisciplinarity transcends multi- or interdisciplinary teaching.[2] While discussing definitions of these approaches goes beyond our scope, please be mindful that this type of education carries different labels in other contexts, such as Community Engaged Learning (CEL) or Society Based Education.[3]

Transdisciplinary education enables a shift in mindset for teachers as well as students. It requires connection and communication with external partners as well as the capacity to deal with uncertainty and facilitate short-notice adjustments to a course's organisation. Although a considerable shift, students tend to find this approach highly empowering and practical, allowing them to make positive contributions towards addressing real societal issues while deepening their own knowledge and skills.

There are many ways in which you could design a transdisciplinary course. These depend upon the course duration and available preparation time, the selected topic, learning goals and (potential) external partners, and the disciplines, methodologies or approaches to be incorporated. In general, you must first identify and decide on the format which works best for your specific context. Below you will find, however, a selection of examples from previous transdisciplinary courses to help inspire you.

News items:

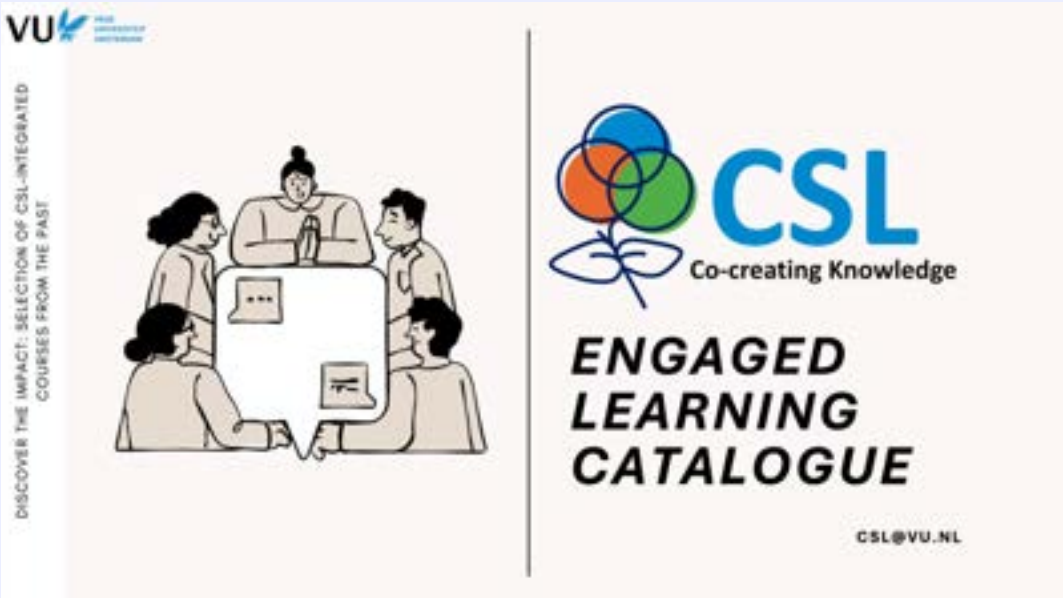
- Students trace plastic pellet pollution in the Port of Rotterdam
- Cycling away from inequality
- Future Foresight: how to anticipate future challenges
- Sustainability firms on partnership LLP: 'An opportunity for reflection'

Prospectus pages:

- Landscape Heritage: Spatial Planning and Sustainable Development
- Minor 'Co-creating a Healthy Society' (in Dutch)
- Leiden Municipality Challenge: Citizen Science and The Most Sustainable Kilometre

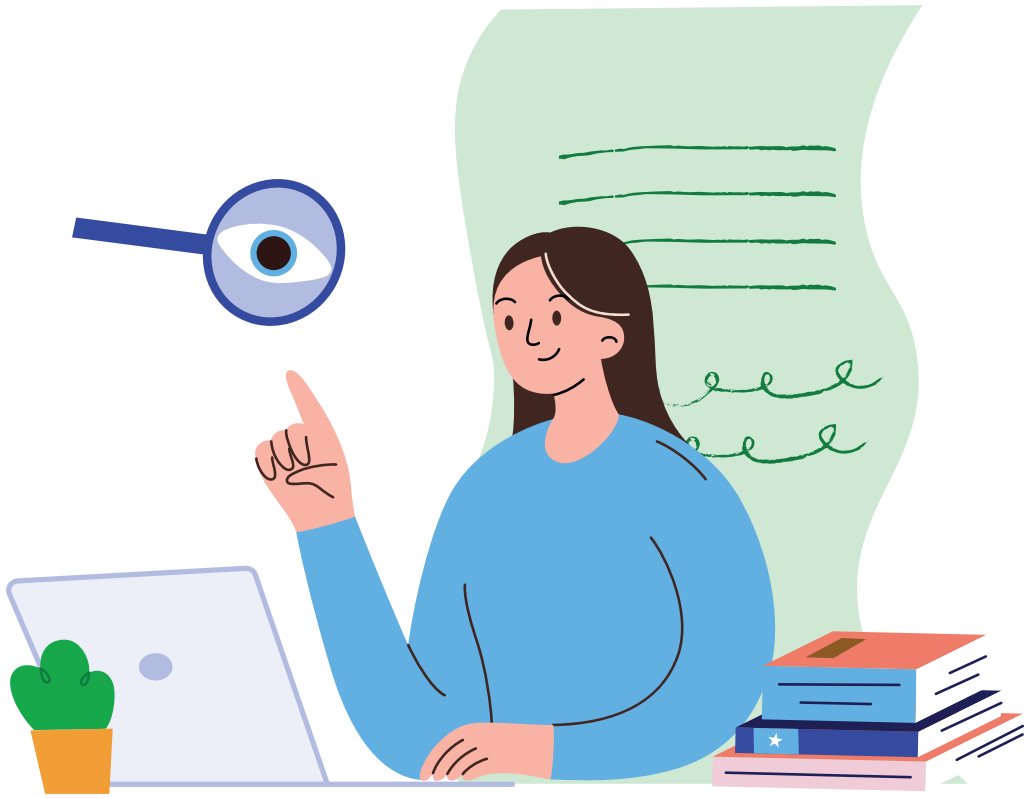
Brochure:

- Overview of the community engagement courses at the VU (local link)[4] per faculty, including questions and brief description of end products



Before:

Aligning Skills, Stakeholders & Challenges



1.
Topic and disciplines, team and learning goals

The first step is to define the main topic or theme of your course. This decision makes it possible to begin brainstorming on how additional perspectives have the potential to enrich it. For instance, what might a legal, technological, psychological, ethical, political, biological, or medical perspective contribute? It might also prove useful and inspiring to co-teach with a colleague from a different faculty (or different university, such as from the Leiden-Delft-Erasmus cooperation), with one teacher taking on the role of coordinator. To find colleagues (either as co-teachers or guest lecturers), use your own network, consult Leiden University's five interdisciplinary profile themes page, or get an easy overview with the AI prompt in this endnote.[5] You could also consider non-academic guest lecturers. These are often highly appreciated because of the insight they offer into how academic concepts work in practice. They also highlight that you value non-academic knowledge. Here, employees and stakeholders from your partner organisations are excellent candidates. If you do invite guest lecturers, ensure that their contribution/presentation is aligned with the course structure and knowledge that students have acquired.

A transdisciplinary course also requires different and additional learning goals. Besides those which are academic in nature, you will also need to formulate goals related to society and reflection. A good starting point is the university's 13 transferable skills framework. The Honours Academy developed six of these in its vision document, providing additional learning objectives for Societal Awareness, Reflecting, Resilience, Collaborating, Project-based working, and Generating Solutions. You can easily select and adapt the goals that suit your course. However, try to avoid tackling too many at once as these types of learning goals require sufficient time.

An interesting addition is to ask students to create a Personal Development Plan, in which they indicate what they want to learn, how they are going to achieve this, and why this is important to them. Moreover, students can be encouraged to define their own criteria for how to measure success as well as for achieving their personal objectives. This facilitates later

reflection upon their progress (with peers, a tutor, or the teacher)[6]. It is also worthwhile to consider co-creating the rubric with students. This increases engagement and establishes the practice of teacher-student cooperation which is conducive to fruitful learning in transdisciplinary courses. Erasmus University Rotterdam provides a good framework (local link) to do this in class.

Image source: The 13 shared transferable skills, Leiden university – vision on education

2.
Challenges and inviting stakeholders

Challenges form the core of a transdisciplinary course (as per our approach). These are real-life projects or problems supplied by a societal partner (stakeholder, or 'commissioner') that students work on in groups during the course. Hence, the course should be structured so that:

1. Students have enough time to work on the challenge
2. The knowledge they acquire during the course is relevant for the challenge
3. Students are equipped to engage in the challenge in terms of skills and ethics

In practice, course design is an iterative process in which learning goals might be revised based on contacts with stakeholders and their challenges.

Stakeholders can be societal partners in the broadest sense: NGOs, municipalities, corporations, foundations, networks, hospitals, ministries, etc. One stakeholder might provide multiple challenges. For instance, one group might work on 'how might we make our website better accessible to visually impaired people?' and another might work on 'how might we increase brand recognition of our NGO with students?'. You do not need to arrange contacts yourself: there are several groups and professionals whose goal it is to help you connect to external stakeholders, so be sure to make use of them: Leren met de Stad (in Dutch, for Leiden, via Marieke van Haaren) and the The Hague Southwest Thesis Hub (via Mandy Koenraads), LDE Centres, or Medical Delta. Both Leren met de Stad and the Hague Thesis Hub Southwest have large networks with societal partners who are already used to working with education. You might also contact knowledge brokers and other experts at the university, currently Lara Ummels (university-wide and Leiden Kennisstad, just use l.ummels@leidenkennisstad.nl rather than her leidenuniv-address), Marlieke Ernst (Humanities), Susanne Roodhuijzen (Social Sciences), Mijanou Blaauw (Law), Richard Jansen (Archaeology) and Kim Duistermaat (Campus The Hague). For Citizen Science,

contact Margaret Gold from the Citizen Science Lab, who may be able to connect you to active citizen science projects. Esther van der Ent (LDE Centre for Sustainability/CML) can help with Sustainability Challenges and uses the approach of sending out request for challenges to societal partners. See these examples (to serve as inspiration for your own use) for the Minor Sustainable Development and the LDE Honours Programme Sustainability. Partners send in proposals through this form which includes examples of previous editions. They also discovered that sending these requests in Dutch helped to lower the barrier for partners to send in a proposal and that the alumni of the programmes are great ambassadors and potential stakeholders. They are often still in junior positions, so it would be recommended to ask them also to include a more senior colleague. Another way to get into contact with these stakeholders is to use your own network or ask colleagues for suggestions, which is also an effective way to connect your research, teaching, and outreach activities. Regardless of how you approach stakeholders, be sure to allow enough time for this process as it will take time to establish contact and clarify the details. Ideally, start arranging this at the beginning of the semester before the start of your course, or even during the previous semester. The table below provides a contact overview for the knowledge brokers and experts highlighted above.

Organisation / department	Contact person	How to get in touch?
Leren met de Stad	Marieke van Haaren	m.g.p.van.haaren@luris.nl
The Hague Southwest Thesis Hub	Mandy Koenraads	m.r.koenraads@fgga.leidenuniv.nl
LDE Centres	-	Contact information
LDE Centre for Sustainability/CML	Esther van der Ent	e.van.der.ent@cml.leidenuniv.nl
Medical Delta	-	info@medicaldelta.nl
Leiden University contact		
University-wide and Leiden Kennisstad	Lara Ummels	l.ummels@leidenkennisstad.nl
Humanities	Marlieke Ernst	m.ernst@hum.leidenuniv.nl
Social Sciences	Susanne Roodhuijzen	s.a.roodhuijzen@fsw.leidenuniv.nl
Law	Mijanou Blaauw	blaauw@lorentzcenter.nl
Archaeology	Richard Jansen	r.jansen@arch.leidenuniv.nl
Campus The Hague	Kim Duistermaat	k.duistermaat@bb.leidenuniv.nl
Citizen Science	Margaret Gold	m.j.gold@cwts.leidenuniv.nl

If you are working with underfunded civil organisations, it is especially important to consider the ethics of the partnership and make sure you are not exploiting their time. Utrecht University puts it well:

> *"Two principles are fundamental to ensuring the effectiveness of transdisciplinary education initiatives. Equivalence ensures that the project is a true partnership, based on cooperation rather than pure consultation. Reciprocity means that both the project partners and students benefit from the project."*[7]

Read more about ethical aspects of designing partnerships in this interactive guide from EUR/TU Delft (here/local link). The section below also provides tips related to this.

3.
Stakeholder expectation management

In your initial contact with a stakeholder, it is useful to sketch the context of the course such as what the course is about (including language, level, and number of students), the type of challenge you are seeking, timeline (start/end date, contact moments, time investment), what results or deliverables they will get out of their participation, some examples of (other/previous) challenges to give a mental picture, and any potential disclaimers.[8] See below for further details but this LDE Thesis Labs' Letter of Commitment provides a helpful example of what to include.

Once you have an interested stakeholder, it is important to establish agreements. First, it is important to communicate the requirements on their side. These are often as follows:

1	Be present at the start of the course to explain their challenge and answer questions from students. Additionally, be present at the conclusion during the Final Presentations when students deliver the outcomes of their project.
2	Provide access to or via their organisation. Students will need to talk to people to gather insights, whether these are employees of the organisation or stakeholders in society. The challenge owner needs to facilitate this by actively making connections and introducing students as well as, when required, providing access to their location.
3	Hold short progress meetings with students (30 min-1 hour, possibly online). Since challenges are typically open-ended, students might struggle with what to do, who to talk to, or determining a suitable form of end product. In a real-life problem, stakeholders often also don't know exactly which steps will lead to 'success', hence it is important to keep communication with students open. Depending on the duration of the course, every two or three weeks is a good rhythm. This greatly increases the chances of success and prevents delays by tackling issues quickly.
4	Provide feedback. To ensure that the deliverable is of practical use, it is important that the stakeholder provides timely feedback, significantly not just at the end. Two rounds of feedback before the final submission are advisable. You might also ask the stakeholder to play a role in assessment (see below).

It is highly advisable to have more than one contact person/challenge owner within an organisation to ensure that students have an alternative contact in case one person does not reply or due to personnel changes. You could also have one more senior person who acts as 'challenge owner' and is present at the start and finish alongside another junior who holds the progress meetings and provides access to their network. At this stage, it is also useful to discuss how and how often you will remain in contact.

Our offer to partners is typically twofold: new perspectives from an interdisciplinary team of motivated students who can look at a problem from a fresh perspective + opportunities to get in contact with possible new employees. Our experience is that *groups of around five students* work well. Smaller groups mean you need more challenges (and run into trouble if someone drops out) while larger groups introduce risks of freeriding.[9] Thus, if you want students to work on the challenge for 50% of your 5 EC course in teams of 5, that is 5 x 70 hours = 350 hours of work for the partner organisation (or 700 hours for a 10 EC course). This is one of the reasons why it is important to allow sufficient time for students to work on the challenge. It cannot be done in two weeks, so it is advisable to spread your course over a longer period if possible. Make sure the partner organisation understands the students are *not* doing an internship but are exploring a challenge as part of their course.

Image: Leren met de Stad, Communicatie\Afbeeldingen\Evenementen\Challengedagen\

Caveat: This is still education, not consultancy.[10] That means that students should be *allowed to fail* and the organisation should not count on the final product for its core operations. It is important to communicate this clearly to partners. They can count on the best effort of students but, if they want guaranteed results, they should hire a consultant. We can, however,

offer a great opportunity to explore *a question they would very much like to pursue, but don't have the time to tackle.*

Usually, we do not ask partners for a financial contribution.[11] If, however, you are working with larger or well-funded organisations like government bodies or corporates, you can discuss contributions of 1000 up to 2000 euros (often possible within their Social Return budget).[12] This money could then be used for project costs (not for salaries), such as hosting a pizza party at the local community centre to reward participating citizens for their time, compensating guest speakers from the community, or creating budget for high-quality communication materials for partners (posters, flyers, hiring audiovisual equipment).

Transdisciplinary education thus sits between consultancy (university bringing knowledge) and consultation (university gathering data). In your choice of partners and framing of the challenge make sure therefore that it is a win-win situation for both parties. You might also consider shifting some of the teaching to take place on-site, i.e. the community centre or offices of the partner and invite their employees, if relevant. It might be a way to offer value to the partner yourself as well, but make sure you are not adding a burden by asking them to facilitate such meetings.

4.
Scoping the challenge & deliverables

After initial discussions with a partner about the topic, expectations, and organisation, you will enter the next phase: formulating the challenge which students will work on. Questions which are either too broad ('what would our organisation look like if you could start all over again?' 'How can we do more with AI?') or too narrow ('can we make better use of the features in MS Teams?") are demotivating for students. A good question should therefore be sufficiently defined as to give focus and direction without being restrictive while also remaining sufficiently open-ended as to allow students to use their creativity and unexpected ideas to surface. For instance: 'How can we foster a sense of belonging in our organisation?' could work but might be too broad. Conversely, 'Which non-Christian holidays should we include in our Outlook calendar?' is too narrow. 'How could we have more inclusive festivities or team outings?' could work better. A helpful way to focus a question is to make it location specific ('...in streets X and Y', or '...at The Hague Central Station' instead of 'in The Hague'). This has the added benefit of having a clear location for students to do their fieldwork. A question should also be formulated in a way that it provides real value for end-users.

Organisations might come up with questions that are too broad because they lack a proper sense of the problem or solution (e.g. 'How can we work more data-driven?'). As the teacher, in your talks with the stakeholder, try to dig deeper into the underlying issue to uncover the question behind the question. 'Problem definition', or 'need finding', is an important step in the transdisciplinary process and, if you do not do this now, it will fall to the students later to uncover the true nature of the underlying issue.

It is often better to err on the side of having a too narrow/specific challenge because this gives students a clear starting point. During their talks with partners/citizens/employees, students might discover that the real issue is larger and, consequently, branch out. A question which is too broad leaves students clueless and stakeholders with too much scope to constantly change their mind regarding what they really want.

Importantly, all parties (students, partners, *and* teachers) should accept that the *question will likely change along the way* based on gathered insights. For instance: "How might we stimulate mentoring within our organisation?" could work well as a starting point for an organisation looking to become more inclusive. Yet if there is structural discrimination or a lack of social safety, the solution should be sought elsewhere. It might also be possible that employees see the value of mentoring, but would prefer group support networks over individual guidance. Flexibility is key and, by being open to change and emergence, the course can provide the greatest value for all involved.

Image: Final presentations to stakeholders, by Nesie Wang Studio, Master Honours Challenge 'Tackling Inequalities', Leiden University

In addition to the starting question, it is also useful to discuss the deliverables. Students will likely come up with something which contains jargon but societal partners are typically not interested in a deeply scientific discussion of their topic, preferring a more tangible product with practical use value. This might take the form of flyers, videos, a workshop design, or (often, at least) an advisory report. While the desired product can certainly change depending on how the challenge goes, knowing what is expected gives a sense of structure for the students. If agreed upon with the stakeholder, be sure to leave room in your course

for workshops which guide students in learning how to make a podcast/poster/video/infographic.

Leren met de Stad (in Dutch, for Leiden, via Marieke van Haaren) and the The Hague Southwest Thesis Hub (via Mandy Koenraads) can assist in defining the question and deliverables by facilitating a discussion with the stakeholder. Since they are familiar with both the academic and non-academic, they can make sure the partnership starts on a solid foundation.

5.
Sensitive information

Sensitive information, intellectual property and non-disclosure agreements

Students might be working with sensitive personal or organisational information, so it is important they are instructed to treat this carefully and confidentially. Remind students that, to outsiders, they are seen as *representatives* of the university and therefore ought to uphold high standards. To instill this belief, you might adapt this informal Non-Disclosure Statement as used in the Leiden Leadership Programme (English / Dutch) and ask students to sign it. Some organisations will have their own which can be useful if students are expected to develop a real product where issues of intellectual property might arise. Since transdisciplinary education benefits from openly sharing knowledge, try to not overly complicate this if not necessary.

The following the stance of Luris as regards Intellectual Property and Non-Disclosure Agreements:

> *"The intellectual property of the results of the student's work belongs to the student. However, external organizations that collaborate with students usually require them to sign their own confidentiality statement or non-disclosure agreement (NDA), primarily to protect their own knowledge and information. These agreements often also include a transfer of rights to the results of the student's work to the external organization. The supervising lecturer can have such confidentiality statements or NDAs reviewed by Luris. If the external organization does not have its own confidentiality statement or NDA but still wishes to have one signed, this model agreement can be used [choose 'Download', 'Enable Editing' and fill in the details, red.]. This covers the minimum necessary requirements but does not include a transfer of rights to the results. Therefore, the external organization must explicitly request this."*

6.
Structuring the sessions: time and method

Depending on the course goals and duration, the time spent on a challenge might vary. The challenge might be a means of putting interdisciplinary theory into practice or, alternatively, it might be the main component around which the course is designed. In any case, it is advisable to spend at least half of the time on challenge-related work, including interviewing, reflecting on progress, making product prototypes, and gathering feedback. Furthermore, the sooner you start with the challenge, the better. You might divide the challenges as early as week 2 to allow students to begin working on the challenge in week 3, while combining theoretical and challenge-related classes in the subsequent weeks. In this way, students get up and running quickly. This is important since arranging meetings with stakeholders as well as (re)defining the problem and testing solutions can occupy a lot of time. See the infographic below for a suggestion of a course outline. Do, however, keep in mind that many variations are possible.

You will also need to determine which method students will use to engage with the challenge. Although there are many options, three which are popular at Leiden University are Design Thinking, Participatory Action Research, and Citizen Science. One is not better than the other. Which is most suitable depends on the type of challenge question as well as your familiarity and preference.

Project Method A: Design Thinking (DT)

Presented as 'human-centred' design, Design Thinking is typically presented as a five-phase or Double Diamond process of diverging and converging. You gather insights *before* you try to define or frame the problem, i.e. you start with a complete beginner's mindset. You then brainstorm ideas to build prototypes and gather feedback from users/clients/citizens before iterating to progress.

Design Thinking is a new methodology for most students and, while many students are enthusiastic about the creative aspect, they must also learn to navigate the uncertainty and need for adaptability that comes with the open-ended nature of the process. Not knowing the end results until relatively late in the process enables students to remain open to engaging with various insights, ideas, and formats. It also, however, creates the need for suitable guidance and coaching along the way. One way of familiarising students with this methodology is by practising it in the classroom step-by-step and by using sample cases. This helps students to learn and experiment with the process in a hands-on manner before applying it to their own group projects. They also benefit from training in the methods and tools of Design Thinking. These can be of great assistance when it comes to conducting interviews to gain insights as well as ensuring that relevant and actionable information is gathered appropriately and used effectively.

Further reading:

- Short, interactive overview from Erasmus University Rotterdam (local link).
- Great overview of the various interpretations of DT and a list of tools for the five phases: Empathise, Define, Ideate, Prototype, Test. For articles on additional tools, see here.
- Design Method Toolkit by the Digital Society School a collection of design and research methods to help you plan and execute a design research, ideation, experimentation, and creation within short iterations.
- Excellent handbook (in Dutch): Guido Stompff, *Design Thinking. Radicaal veranderen in kleine stappen* (Boom, 2018).
- In general, it is advisable to contact LLInC as they have considerable experience with Design Thinking.

Project Method B: Participatory Action Research (PAR)

Participatory Action Research (PAR) is an approach that works towards social change together with people participating in the research. While there is some overlap with Design Thinking in the sense that PAR also involves creatively working towards concrete and tangible outcomes, the overall goal of PAR is more towards collective learning and sustainable solutions. In this process, participants become active partners in the research. Together with the researchers, they define problems, conduct research, and implement change. If you want to know more, contact: Coen Wirtz (FSW) or the Leyden Academy on Vitality and Ageing, for example Miriam Verhage.

Project Method C: Citizen Science

While different definitions exist, citizen science is about doing research in cooperation with the general public. There are highly accessible e-learnings from introductory to advanced here. This LERU position paper (link/ local link) also gives a good overview of the most important principles. The easiest way to get acquainted with this method is, however, to reach out to Margaret Gold of the Citizen Science Lab.

Further reading:

- Roche et al., Citizen Science, Education, and Learning: Challenges and Opportunities, *Front. Sociol.*, 2020, https://doi.org/10.3389/fsoc.2020.613814

During:

Structure, Guidance & Reflection

1.
The first session

During the first class meeting, it is useful to spend considerable time to establish connection since students will be extensively involved in group work and must feel comfortable to share their feelings and failures regarding the project. If you are comfortable with demonstrating vulnerability yourself, a powerful option is the Happy/Sad Memory (credit: Aminata Cairo): ask students to pair up with someone they don't know yet and ask them to share a happy memory (2-5 mins) after you have shared your own. You then share a difficult memory and ask the same pair to do the same. Subsequently, you ask them to reflect what that was like, which one was harder, and what it yielded.

2.
In the first weeks: Dividing challenges & initial contact with partners

You can either divide students yourself or allow the students indicate their preferences. In case of the latter, it works well to have the partners present their challenges during a 'Challenge Fair'. Depending on the number of partners, you might give each partner 15 minutes to present and 5 minutes for questions from students. This can be done online but it is preferable to invite the partners onto campus. If possible, allow some time for informal questions, networking, and relationship building during breaks or afterwards.

After the Challenge Fair, ask students to rank their preferences for the challenges in an online form (at least their top 3 and perhaps a least-favourite option which they would avoid). This

helps you when allocating the groups. Expectation management is key here. Students ought to be aware that, while they may not get their first choice, a conscious effort will be made to match them with a project which holds their interest. Although some people may not get their first choice, once they begin, this often is not a problem. After the challenges are divided, students should swiftly arrange a meeting with their partner to discuss further details, develop contacts, and get started. Whenever possible, encourage them to do this on-site rather than online as this will be beneficial for everyone involved.

Image: Leren met de Stad, Communicatie\Afbeeldingen\Evenementen\Challengedage

While some students may have previous experience with group projects, most will be new to working on such an open-ended project and with external partners. It is thus crucial to provide students with guidelines and tips on professional communication and project management. This can be as basic as how you address someone in an email, but can also extend to include: scheduling regular, recurring meetings with the stakeholder as well as deadlines; being proactive rather than reactive in communicating, especially when it comes to obstacles; agreeing on channels of communication (email, Whatsapp, Slack, Teams, etc.); and assigning one person (and one back-up) to communicate with the stakeholder.

It's wise to check-in with the partner organisations in these first weeks to verify that students are indeed contacting the partners as well as to resolve any potential difficulties. You can also advise students to copy you into all correspondence with the stakeholders to enable you to monitor communication and step in if needed. In general, it is advisable to check in regularly with partners because students may not inform you if there is an issue. If possible, arrange a check-in on site mid-way through the course. This gives you a better idea of the environment and strengthens the relationship with the partner.

3.
Ethics, power and privilege

Ethical aspects do not only come into play before the course when selecting organisations and designing the partnership. They are must also be regarded as important throughout. Depending on the challenge, students might be engaging with disadvantaged communities, and so should behave in a sensitive manner, making sure they are not just 'taking' or 'gathering data' from people. Some disadvantaged neighbourhoods experience 'research fatigue' as a result of too many researchers surveying them, hence inhabitants might not be interested in answering further questions regarding safety or poverty. This is why it is important to reaffirm the importance of equivalence and reciprocity. What can students offer in exchange for asking for the community's time/effort? Remind students that "to enter another's world as a researcher is a privilege, not a right"[13]. Many students are unaware of their own privilege and may find it challenging to empathise with people from different backgrounds. Without preparation, they may come up with solutions which are ill-matched or even insulting to a target audience (i.e. proposing campaigns about healthy eating for households experiencing financial stress). Michigan State University offers class activities to help students reflect on their privilege: the Paper Toss Game (or Appendix N here, about unequal positions), the Social Identify Wheel (or Appendix O here, reflecting on different parts of one's identity) or the well-known Privilege Walk (4 min video and instructions with questions). In any case, it is worthwhile to dedicate a class session to ethical dimensions. You might also ask students to fill out the ethical checklist developed by Coen Wirtz (local link) and could contact Mandy Koenraads to share her expertise as coordinator for the The Hague Southwest Thesis Hub.

4.
Reflection: Types and templates

Reflection is an essential component in a transdisciplinary course which ties the application of academic knowledge together with societal engagement and students' personal learning goals, experiences and progress. Three types of reflection are useful to include: *Cognitive* reflection (about students' new knowledge and skills), *affective* reflection (how students feel about their experience and how it has changed their opinions or sensitivities), and *process* reflection (about what students learned from this type of education, including cooperation, set-backs etc.).[14] Reflection should take place at the *start* (regarding expectations, positionality), *during* (on experiences) and at the *end* (on their growth and changes in attitudes) of the course.

A helpful format for structuring reflection is the DEAL model (Describe, Examine, Articulate Learning). See here (local link) for a list of prompts for reflection. The *What? So What? Now What?*-structure is also a useful framework and you can find an example of its operationalisation at the EUR (local link), including an example of student work.

Reflection can be done in various ways, such as by keeping a personal log/journal (as part of the assessment), writing a reflection assignment or portfolio, or through class discussions. Preferably, these would be combined, hence be sure to reserve class time for these kinds of activities (15-20 minutes on a few occasions already goes a long way). See here for more activities you can do both in and beyond class.

5.
Data collection and necessary training

Your students will need to gather data (often qualitative in nature) and they likely have no prior experience with the methods (Design Thinking/PAR/Citizen Science) and associated instruments involved including focus groups, semi-structured interviews, empathy maps, how-might-we-statements, and brainstorming. It is therefore recommended to organise sufficient training activities and to select only 1 method to enable you to go into greater depth. It is advised to choose the method which is most relevant to the course's topic and the orientation of the students' projects. The more students can practice with one another in class, the better they will do in the project. Hence, be sure to reserve sufficient time for practice. One approach would be to train the skills as and when they become relevant, i.e. divide the five phases of Design Thinking over five weeks. This allows students to put their skills into practice immediately (see syllabus of the course 'Tackling Inequalities' below for an example).

You can practice in class with topics relating to students' own experiences. Regarding Design Thinking, there is an often-used one-hour workshop format from Stanford's design school which asks students to engage with each other to redesign the wallet, or the gift-giving experience (see here for materials and here for a 30 min video on how this is done). You can of course change the topic to redesign the cafeteria/the library/'lunch experience'/a night out/ 'the exam preparation experience'/etc.

6.
Knowledge integration

Integration is important on two overlapping levels. Firstly, students must be able to move beyond separate disciplinary perspectives to forge a new interdisciplinary perspective on the topic. Secondly, students must be able to work as an (interdisciplinary) team. In order to develop an interdisciplinary perspective, it is essential that students agree on both the concepts and problem definition. This creates the required common ground. In connection with the

core topic/theme of the course, the key relevant disciplinary perspectives should be introduced in class along with recommended resources. It is also useful to have an overview of the academic backgrounds of your students. Utrecht University has a short and helpful video which explains how to work on knowledge integration, and the VU has another on the four different types of team work behaviour you might observe (naïve, assertive, accommodating and integrative). The VU also has a well-tested 'Frame reflection' workshop which helps students to overcome disciplinary boundaries (see these local links for the manual, the materials to print, the reflection questions and an explanatory article).

Further reading:

- Repko, A. F., & Szostak, R. (2021). *Interdisciplinary research: process and theory*. Sage publications

7.
Supervising project teams
(team qualities, team contract, and group dynamics)

For most students, this type of education is unfamiliar, making it wise to spend time on the subject of how to work as a team both at the course's *start* and *mid-way* points. At the start, take time to reflect on Team Qualities and establish a Team Contract. If you want to reflect on team qualities in class, you might use this poster-building activity from Wageningen University (here/ local link). If you want to ask students to reflect on their qualities, needs, and preferences in teamwork *before* coming to class, the Brightspace tool developed by Marit Guda and colleagues at FSW is very useful (available from the second semester 2025-2026, requests via samenwerkingstool@fsw.leidenuniv.nl). Students also need to develop a shared understanding when it comes to medium of communication, meeting frequency, and methods for conflict resolution. For these reasons, creating a Team Contract

is highly advisable. Erasmus University Rotterdam has a clear class outline for this (see here / local link). ITP Metrics (associated with the University of Calgary) also has a useful slide deck (local link) and word template (local link).[15] They advise dedicating 75-90 minutes to discussing and creating a Team Contract in class.

As the project moves along, friction may begin to occur within the group. The sooner you become aware of this, the better. It is therefore advisable to meet with your students in groups on a regular basis and a check-in every 2-3 weeks works well. You can use this time to answer questions as well as discuss how the project is going and how the team is functioning. This can be a 15-30 minutes online meeting for which the students send in a progress report, reflection, or assignment. You could also use the time during breaks in the classroom to check in informally with groups and show your own approachability. This makes it more likely thar students will not hesitate to come to you for help or intervention. In general, try to be mindful of the developing dynamics and be proactive in your approach. If disputes occur, remember to include students in the resolution process rather than fixing their issues for them. They must also learn to take ownership of their group process.

You do not necessarily need to do this supervision yourself and can also invite others as *coaches*. For example, on a Citizen Science project, you might ask Margaret Gold. In general, supervising a group might also be an interesting way for PhD researchers to gain educational experience.

8.
Final products & closing event

Transdisciplinary education is typically more about the learning process for students than the exact outcome. Of course, however, the outcome still matters. To ensure students take the final product seriously, invite the stakeholders to the final presentations at the closing event and request that they provide feedback. Preferably, they have already given feedback on one or more intermediate versions since the first version is unlikely to be of high quality. It may be possible

to organise the presentations to take place on the partner location, focusing specifically on their needs.

Since stakeholders require concise communication without jargon, prompt students to test their products with a lay audience outside of the class (i.e. friends, family) to gain honest feedback if their product and communication is comprehensible. Moreover, you could organise a workshop on the basics of science communication with students since this is a relevant skill worth developing not only for their presentations, but also beyond.

It is advisable to organise a practice round before students present before the real stakeholders. This could take place approximately 1-2 weeks before the closing event, allowing students sufficient time to incorporate any feedback or lessons learned. If you didn't organise such presentation practice (perhaps because you only gave written feedback on the product), it is wise to do this on the day of the Closing Event. Ask students to present to each other in the morning, so they feel ready and more confident presenting to stakeholders in the afternoon. If possible, you can also discuss with communication services to make a news item of the final presentations. This would give publicity to this type of education as well as the students' work. Leren met de Stad (in Dutch, for Leiden, via Marieke van Haaren) and the The Hague Southwest Thesis Hub (via Mandy Koenraads) have experience organising such events and can provide guidance on how to make these arrangments.

Since students are typically unfamiliar with group dynamics or communication styles, they benefit from more awareness and reflection on these subjects. There are various online tools to support this process. You can direct them to the short Team Role test from the LU Career Zone, which gives a score per role (like Expert, Innovator, Chairperson) to provide insight into how they themselves tend to function within a group. To make it more specific to the current group project, the aforementioned ITP metrics also has helpful tools including Team PLAYER

(see sample report/local link). In this, students first rate themselves on traits such as reliability and leadership before receiving peer feedback to compare. Another of these concerns Conflict Management Styles (sample report/local link). These tools could be used as a basis for discussion and to update the Team Contract, for instance with new agreements and personal learning goals. In any case, a mid-term evaluation of team dynamics is highly advisable. The ITP Team Dynamics assessment (see sample report/ local link) can be a useful input, although it takes 20 minutes to complete the questionnaire. To create these assignments, go to itpmetrics.com and create a free account. A less time-consuming option for students is to use the mid-term feedback tool from Guda et al. in Brightspace (see above). You can ask students to reflect on this group process in their final reflection (see *Student debrief* below).

Image: Student presentations, by Buro JP, LDE Sustainability Honours


SAMPLE COURSE OUTLINE
01 Intro & community
Explore topic
Community-building acitivites
Reflection on expectations
02 Method & challenge
Introduction to project method
Societal partners present their organisation and challenge
03 Ethics & team contract
Ethics workshop
Reflecion on personal qualities
Drafting team contract
04 Diving deeper
Academic content
Training in first phase of method
Start of field work
05 Gathing insights
Engaging with partner organisation
Interviewing stakeholders
Defining the problem
06 Refing insights
Guest speaker from partner organisation
(Training in) analysis of gathered insights
Redefine problem
07 Prototype
Develop first proposal of deliverable
Evaluate team dynamics
Test protoype with target audience
08 Iterate
Refine product
Test again
Ask partner for feedback
09 Draft presentation
Make first version of report
Present deliverable for class
Incorporate feedback
10 Final presentation
Present to partner organisation
Reflection on group process, personal learning goals

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After:

Assessment & Debriefing

1.
Assessment for Learning

Since a transdisciplinary course is typically more about the learning *process* than the specific outcomes or *products*, this should be reflected in the assessment.

Intermediate products can be graded well, both in a formative and summative way. For instance, if you are using Design Thinking, you might evaluate an Empathy Map or an Ideation Report (see Course Manual *Tackling Inequalities* by Aayushi Shah and Niloufar Daneshkhah, below). The feedback on those products is most important. When designing the schedule for assignments and deadlines, be mindful of the feasibility for students and ensure that there is sufficient time between deadlines to allow for the implementation of feedback from previous assignments. Some form of mid-term assessment is recommended since this helps students stay on track. This could take the form of a problem statement, sharing insights from interviews, or a first prototype of a solution. Try to keep the assignment size realistic for your grading load, for instance, by adjusting the word limits, considering various assignment formats (story board instead of written essay), and using group assignments. If this sounds like too much grading to incorporate, you might consider assessing their progress through class presentations. Of course, you can also organise the peer feedback of written work or have student groups take part in an Intervision process themselves (see this format / local link) from Utrecht University). A final reflection report can also be graded with the grade being dependent upon the depth of reflection. Here is an example of a pass/fail rubric (including the reflection prompts) from Coen Wirtz from his Participatory Action Research course. Here (local link) is a four-level one from Erasmus University Rotterdam.

Regarding the final product, it is possible to grade the presentation (a small percentage) but might feel uncomfortable grading the quality of, for

instance, an infographic or video. One option is to request the stakeholder to provide a grade. Here, however, exercise caution as this may introduce bias owing to the absence of a uniform yardstick across groups. While some stakeholders might think a 7.5 is a good grade, others might believe this number to be closer to a 9. You might still ask them to provide a grade, as a motivation for students, but weigh it yourself. Another option is to invite a colleague with sufficient experience with this type of education as external evaluator. This increases exposure for the interesting course you have created, while providing an objective outsider perspective for students.

In general, it's advisable to use *qualitative* grading. Think about using pass/fail (for example for reflection essays) or insufficient/sufficient/good/excellent. Trying to attach a decimal grade to this kind of work is tricky and might trigger discussion and competition between groups while putting too much emphasis on the grade rather than the learning experience.

A well-tested and validated rubric from the WUR's Boundary Crossing framework can be found here (local link) on pages 12 and 13. This is easily adaptable to your own courses. It is recommended to share the rubric with the students before the submission deadline. If you spend time with students co-creating learning goals, do not forget to adjust your rubric accordingly and incorporate flexibility. It is advisable to have a balance between the weight of individual and group work. For example, an individual reflection portfolio as well as a group report (with an interdisciplinary problem analysis, intermediate products and progress reflection) and a group-based assessment of the final product. You can be creative in the format, letting students reflect on their process through a video, podcast, or blog. Oral examinations are also an option, although time-intensive.

If students document their process and receive frequent feedback, there is less need for a heavy assessment at the end to determine whether they have met the learning goals. A practical way of simultaneously giving feedback and assessing learning goals is to use a 'Single point rubric' such as the example below from Twente University.[16] There, you can tick off whether a student met the described 'planning' goal while also giving compliments and points to improve. A more detailed example from the same authors can be found here (local link) and for further reading see here (local link).

	What can be improved	Standard level	What exceeds standard level
Planning their work		The students made a clear plan with an overview of activities, milestones, and task division. Planning was adapted when necessary.	

2.
Student debrief

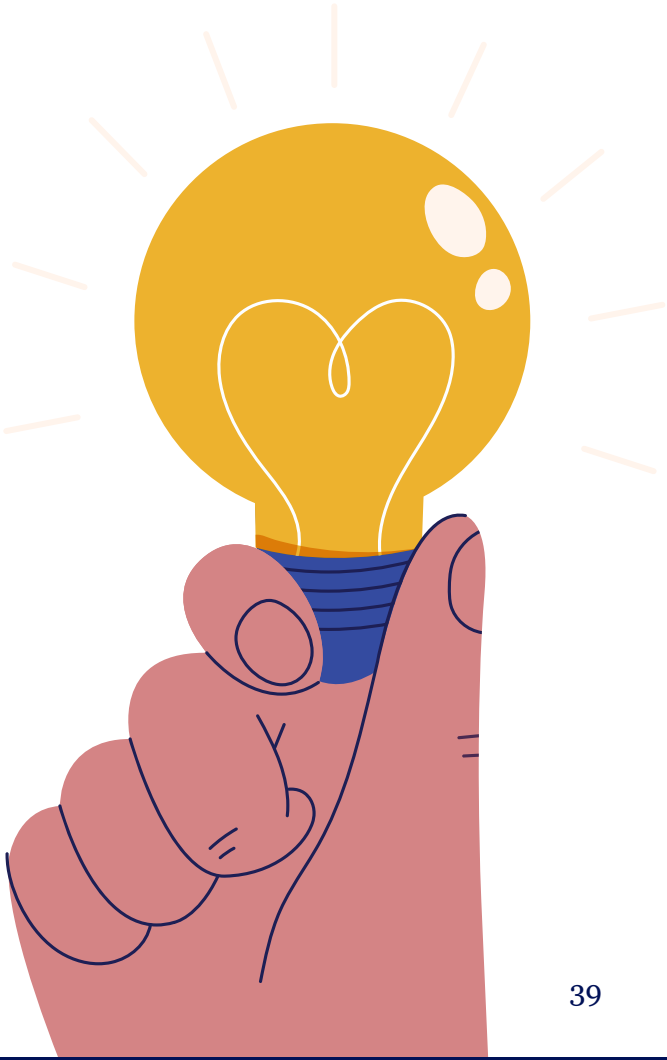
Your students will likely have engaged in transformative learning and it is important to prompt them to reflect on this process to stimulate this further. A common approach is to ask for a final reflection which might be included in a broader final portfolio. Wageningen University has a list of excellent questions (here/local link) which you can pose, based on their Boundary Crossing framework.

3.
Debrief with partners

Once the course is over, check in with your partner organisations to hear about their experience. This helps to maintain the relationship as well as improve the next iteration of your course. This is also an opportune moment to assess whether they would like to participate in the next edition, brainstorm regarding possibilities for another course, or gather further contacts.

Bonus tips:

Pitfalls, tips & sample syllabi



Pitfalls & tips

Communication

Communication is one of the biggest pitfalls. A student project is often not on top of stakeholders' lists, hence in busy times they might become unresponsive. Some students then send a few reminders and give up afterwards, rather than calling or talking to the lecturer. That's why it's important to remain in contact with your stakeholders and regularly check in with your students to evaluate how the process is going and remind them that it might be a wise option to call. Additionally, ensure that students have planned meetings with their stakeholders in advance, rather than try to email back and forth five times about a date every few weeks. In general, the more students are *on location* (whether that is the neighbourhood or a company's office), the better. For instance, you might arrange with a stakeholder that students have a workplace in their offices every Friday. This allows for greater ease of contact.

Another related form of communication breakdown may arise if a stakeholder changes department or jobs. This is why it is advisable to have two contact people. If this is not possible and someone else must take over, it is best to organise a hand-over meeting (on site!) with the new colleague. This ensures that the new person both knows where the project stands and feels responsible.

Communication issues may also occur within the student team, for instance because of personal disagreements. Again, it is wise to regularly check in as well as to offer one-on-one meetings with you as lecturer where students can discuss issues in the team. Since they might not raise these disagreements in a team meeting, they should feel that you are approachable and know that it is important to reach out with any issues.

Lack of engagement

Another pitfall is to think too lightly about engaging in this type of education. For students this is a new experience. It is important to make them aware they will be seen as representatives of the university and thus that have a responsibility to act professionally. This means being present, meeting deadlines, and communicating clearly. Furthermore, students need to learn to deal with *uncertainty*, new methodologies, and the lack of a clearly defined roadmap or answer. This is challenging because they have likely never learned to do this. Hence, the

reflection part is important since this allows students to make sense of the process. Furthermore, a clear structure from the start, sufficient training, and regular check-ins are helpful. Manage expectations clearly (with regard to procedures, timelines, communication, success indicators, etc.) and prepare students for the open nature of the process so they do not feel discouraged before the final product begins to take shape.

Rigidity

Rigidity is another pitfall. This could be on the part of anyone involved. The stakeholder might desire a certain solution while the research demonstrated that the problem requires something different. It is therefore important to discuss with stakeholders beforehand that students must have the freedom to explore and propose their own options since this is a vital part of their learning process within the course and counts towards their learning outcomes. Another way of dealing with this issue (inspired by Design Thinking) is to present multiple options for a solution to the stakeholder: one in their desired direction, one which is sacrificial, and one favoured by the students. This opens up the space for discussion. Flexibility is also important for students. They should not become overly attached to their first ideas and ought instead to remain open-minded about alternative pathways. For this reason, it is important to emphasise that everything is a process of learning and that changing your mind based on new insights is positive. Finally, as a teacher, you also need to be flexible. Assignments might change along the way. You may also need to adapt your teaching methods and techniques to better fit the specific group of students so remember to pay attention to class dynamics and needs. Bear in mind that you might have to make (minor) changes to your structure and expectations due to changing real-world circumstances. Remain flexible and try to keep alternatives in mind to accommodate these changes.

Language barrier

Language can also arise as a barrier. While some organisations might say they are open to non-Dutch-speaking students, they might have vital documentation which is only available in Dutch. Alternatively, the relevant employees or stakeholders have trouble communicating in English or desire the deliverables in Dutch. It is therefore advisable to think carefully about the language requirements of your course. If you are working with international student teams, it is often useful to have at least one Dutch-speaking person within each team, although the team

needs to find a way that make sure the workload remains evenly distributed (i.e. avoid a situation in which the only Dutch team member is making all the final products). Additionally, language might be an issue in the sense that people may hold various definitions of the same concept, as is possible with words such as 'sustainability'. This is why it is important to pay specific attention, clarify concepts, and establish a common language.

Finally, make sure the cooperation is truly valuable for your partners, rather than just for the students or university. This type of education will become more common in the coming years and we must ensure that we do not overburden either partners or neighbourhoods. Hit-and-run cooperations are to be avoided. While this is tricky with education as students are typically gone after the course, you can design a recurring 'relay' course, in which future students continue where a previous group has stopped. Or, if possible, arrange for motivated students to continue their work as a thesis or internship. Ideally, we invest in long-term relationships with partners, in which research and education are combined and reinforce one another.

Examples of syllabi

- Design Thinking-based: Tackling Inequalities in the 21st century – 10 EC Honours Challenge see e-prospectus page here
- Participatory Action Research-based: Making impact: bridging research and society for inclusive health and wellbeing, 5 EC Master Honours Class, see e-prospectus page here

Please email us if you want to include your syllabus here:

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Acknowledgements of guides from other universities:

- Michigan State University (Service Learning, see also this local link pdf)
- Utrecht University (Community Engaged Learning, see also the Transdisciplinary Field Guide)
- EWUU, (Challenge-Based Learning)
- Wageningen University & Research (Boundary Crossing)
- KU Leuven (Service Learning)
- Twente University (Challenge-Based Learning)
- Universiteit Gent (Community Service Learning)
- Erasmus University Rotterdam (Impact-driven education)
- Vrije Universiteit Amsterdam (Community Service Learning)

Notes:

[1] While education and research can obviously overlap, this guide is focused on the education of students, i.e. where students are doing the research, in courses or theses. Transdisciplinary research by staff deserves its own guide. Luris offers a lot of support in this regard.

[2] Multidisciplinarity is about having different disciplines work on the same topic, but separate. In an interdisciplinary approach you also integrate these different perspectives, to develop a shared language and understanding, rather than having them as separate components or chapters. In practice the difference is not always easy to make. Transdisciplinarity is about getting students to go out into the 'real world' to work on real challenges. It therefore goes beyond inviting guest speakers or discussing case studies.

[3] Other labels related to transdisciplinary education are challenge-based learning (TU/e, UTwente), impact-driven education (EUR), *Leren met de Stad*, community engaged learning (CEL at UUtrecht) or (community) service learning (CSL at UGhent, ULeuven, VU and society-based education (WUR).
Methodologies like Citizen Science (Leiden), Placemaking (UvA, Haage Hogeschool), Living Labs (Haagse Hogeschool), Learning Communities (TU Delft), Design Thinking or Participatory Action Research also have overlap, and can form part of, transdisciplinary courses.

[4] Throughout this guide we often use direct links to online sources, but also 'local links' to the same files in a Leiden University Teams environment, to make sure the files stay accessible if a web address changes.

[5] Prompt: *I'm looking for colleagues at Leiden University to co-teach a transdisciplinary course on [course topic]. Your goal is to please provide suggestions, including links to their*

profile page. Be sure to take your time to be thorough and check yourself to make sure you provide a comprehensive and inclusive list, including PhD students and Post-docs.

Perplexity.ai seems to be working quite well with this at the moment, but this might be different at the time of reading. Regardless of the tool, it's useful to try a few times (because that might yield different results) and to make sure to use 'deeper thinking'/'deep research' or a similar reasoning model (to prevent hallucinations).

[6] F. Van den Berg, "CBL Assessment @ UT – recommendations and examples for teachers", December 2024, https://www.utwente.nl/en/learning-teaching/educational-design/challenge-based-learning/documents/cbl-assessment-ut-guidelines-for-teachers-final.pdf (or local link).

[7] From the Utrecht University Field Guide: Barriers and challenges to effective transdisciplinary education - Transdisciplinary Field Guide - Utrecht University

[8] Teaching and Learning Center, Wageningen University & Research, 'How to integrate real cases in your course: a quick start guide. Appendix 5: Template information letter'.

[9] Although International Studies has an effective format with 15 students per group in their course Practicing International Studies (PRINS)

[10] Other forms of transdisciplinary cooperation can go more into the consultancy direction, such as PRINS (PRacticing INternational Studies), or LDE Thesis Labs, in which students write their masters' thesis about a challenge from a partner.

[11] In the LDE Thesis Labs Master's students work on projects submitted by industry partners, making it more like consultancy work. Hence it can involve a bigger contribution from the partner.

[12] Like they do at the The Hague Southwest Thesis Lab. For real consultancy work, like the LDE Thesis Labs, substantial amounts are paid by partners, but that's a different type of education than we are discussing here.

[13] Fujii, L. A. (2012). Research Ethics 101: Dilemmas and Responsibilities. *PS: Political Science & Politics*, *45*(4), 717–723. doi:10.1017/S1049096512000819

[14] Adapted from: https://www.goodcharacter.com/service-learning-primer/#reflection

[15] This is also accessible via https://www.itpmetrics.com/. You need to make a free account to login, after which you will have access to various resources, including the ones on team dynamics.

[16] Siska Simon et al, 'Handling assessment when including CBL in your course', appendix 4, June 2021, https://www.utwente.nl/en/learning-teaching/educational-design/challenge-based-learning/documents/2021-06-16-cbl-assessment-teacher-curricular-final.pdf,

If you want to read more and get involved:

- Honours education is an accessible way to experiment with transdisciplinary education. If you want to (re)design a course, please reach out to the Educational Director, Eline Bergijk at e.c.bergijk@ha.leidenuniv.nl to discuss the possibilities
- LLInC is facilitating a Special Interest Group as part of the Leiden Education Support network that will start in spring 2026. Professional staff, education researchers and teachers will work together on their shared interest of the topic and meet regularly to share best practices. If you want to know more about this SIG or other opportunities, you can now subscribe here
- There is an LDE Community of Practice where knowledge on transdisciplinary education is shared. They published a Position Paper making the case for embedding transdisciplinary education in LDE universities. Email Marja Verstelle if you want to join this Community of Practice
- Joost Broekens, Thijs Bosker, Esther Gramsbergen and Gijs Elshout created this guide (in Dutch) to help educational directors think about embedding transdisciplinary education in the curriculum
- The *Praktijkgids Transdisciplinair Werken* (in Dutch) by Het Groene Brein and Community Sociaal Circulair (here / local link) offers useful insights into the different roles in transdisciplinary cooperation beyond education
- Wina Smeek (Lector at InHolland University of Applied Sciences) has developed various tools, such as the Co-Design Canvas to help structure co-creation processes
- The Institute for Interdisciplinary Studies at the University of Amsterdam has several books about inter- and transdisciplinary education, such as this one
- Contact Luris if you want to know more about valorisation of research in transdisciplinary partnerships

Contact:

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The Leiden University Guide To

Transdisciplinary Education