

Teacher needs in interdisciplinary teaching

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Interdisciplinary (ID) collaboration requires explicit training to prepare students for addressing wicked problems in an ID team (Di Giulio & Defila, 2017). It is important to provide students with an insight into *what ID collaboration entails, why it is important to learn ID and to teach students ID skills.*

ID skills (Boix-Mansilla et al., a.o., 2010, 2016):

- setting a common goal;
- understand and value different relevant disciplinary understandings;
- integrating relevant insights;
- maintaining critical towards different (and one's own) disciplines.

Despite all existing learning activities/tools (f.e. The Twente Toolbox), it appears to be difficult for teachers to support learning in interdisciplinary teams (Visscher-Voerman & van Harmelen, 2019).

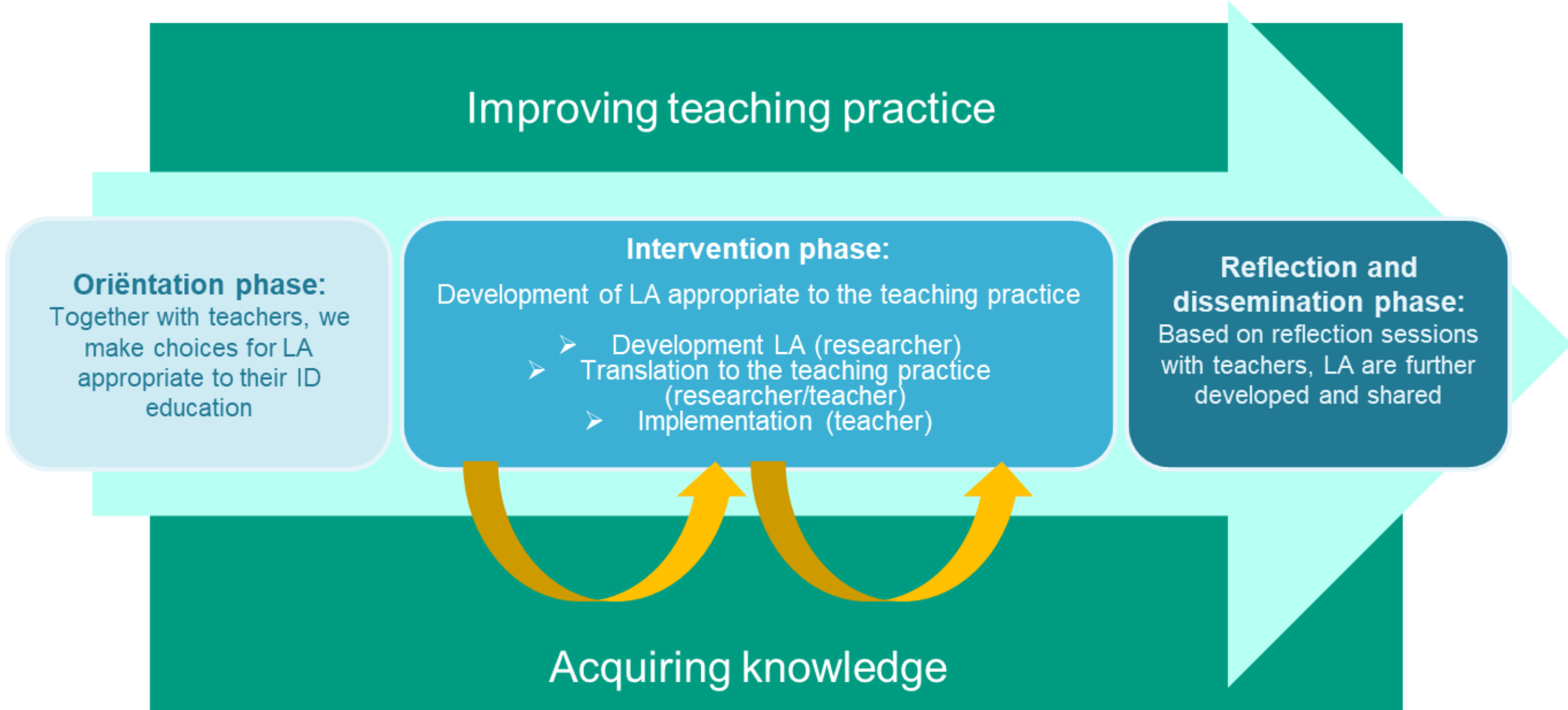
Research questions

This study focusses on the needs of teachers regarding the implementation of tools for interdisciplinary collaboration. The research questions are:

- Based on what reasons do teachers choose learning activities (LA) to enhance interdisciplinary collaboration in interdisciplinary teams?
- How should interdisciplinary LA be designed so that they suit teachers' needs?
- How do teachers experience the implementation of the LA?

Method

This study is based on action research (Van der Zouwen, 2018), which means that the teachers are involved in the development of ID-LA to improve their teaching practice.



The study is conducted with teachers (N=11) within modules in 5 courses in various years of study (year 2, 3 and 4) in which students work in ID teams on wicked problems. The implementation of the LA takes place from February 2024 till December 2024.

Presentation of (the selected) LA

The toolbox is developed in a previous literature study, is completed in the orientation phase and the choosen LA are presented in **bold**.

A. Collaboration and communication in general	B. Understanding relevant disciplinary insights (different perspectives)	C. Integrate relevant insights to the issue (content)	D. Integrate relevant insights to the issue (process) and setting a common goal
1. Getting to know each other, work on trust and structure 2. Structured feedback moments 3. An inside look at another discipline 4. Game of qualities 5. Interdisciplinary speeddating	1. Playfull Frame Reflection Lab (FRL) 2. Roleplaying 3. Case study approach 4. Learning activities UU 5. Force Debate 6. Stakeholdersanalysis	1. Learning activity interdisciplinary collaboration 2. Knowledge-based concept mapping task 3. The use of Mock-ups 4. Scenario building (1): Imagining the Ideal 5. Scenario building (3): Integrated timeline 6. Scenario building (4): mindmapping and mini-mindmapping	1. Process-based concept mapping task 2. Shared working method 3. Scenario building (2): backcasting
1. Competence triangle		1. Scenario building 2. Scenario building (5): cross-Impact Analysis 3. Systeemdenken 4. CoNavigator	

Results

At this moment 11 LA are developed and shared in a Teams environment. This is an example of a LA with the aim *to integrate relevant insights*:

C5. Scenario building; integrated timeline	
What is an integrated timeline?	Integrated timeline is a type of scenario building in which participants look from the perspective of their discipline at events/factors that influenced the origins of the wicked problem. These factors are placed on a timeline. An example of an integrated timeline.
Aim of integrated timeline	An integrated timeline makes you look at the origins of an existing problem from different perspectives This method provides insight into what has led to the current situation and thus can be part of the problem analysis. It helps interdisciplinary groups integrate relevant insights to the wicked problem.
When do you apply integrated timeline?	This method is designed for an interdisciplinary project team working together on a wicked problem from practice and can be used when the problem needs to be analyzed.
How much time does integrated timeline take?	The time an integrated timeline takes depends on the depth of the implementation. If you conduct the work form based on prior knowledge, the LA takes 1 to 1.5 hours. If participants are actually going to delve into the events/factors that influenced the problem, it is wise to divide the LA over several meeting.
What is the procedure?	
How is learning with and from each other stimulated?	
What is the outcome?	
Who has which role?	
What needs to be prepared?	
References	

Conclusion/discussion

Teacher needs	
	Teachers have different needs in implementing LA in their ID teaching
	Teachers think carefully about the positioning of LA in their teaching program
	Teachers experience opportunities for further development: • Implementing LA at module level • Teach students the LA itself
	Teachers guide initially more on content and less on ID collaboration
	Sufficient time and a safe environment are essential for students' dialogue

Learning activities	
	LA focusing on both the wicked problem AND ID skills seem most valuable
	Starting from personal input is preferred among teachers; starting from your own discipline is difficult and less motivating
	Reflection seems to be an important means of raising awareness: • Reflection as part of the LA • LA with the aim to reflect on the ID collaboration
	Ensure dynamics and creativity in the LA to stimulate interaction
	LA in which students learn to converge (broad thinking and see many perspectives) are valued
	Make sure students have sufficient prior knowledge about their own discipline to contribute

The number of learning activities is still under development as this study ends in December 2024.

Referenties

Boix-Mansilla, V. (2016). Interdisciplinary Learning: A Cognitive-Epistemological Foundation. In Frodeman, R., Klein, J. T., & Pacheco, R. C. D. S. (Eds.). The Oxford handbook of interdisciplinarity, second edition (pp. 261-275). University Press.

Di Giulio, A., & Defila, R. (2017). Enabling University Educators to Equip Students with Inter-and Transdisciplinary Competencies. *International Journal of Sustainability in Higher Education*, 18(5), 630-647. <https://doi.org/10.1108/IJSHE-02-2016-0030>

Van der Zouden, T. (2018). *Actieonderzoek doen, een routewijzer voor studenten en professionals*. Boom Uitgevers.

Visscher-Voerman, J. I. A., van Harmelen, E. (2019). *De rol van tutor bij interdisciplinair studentgeoriënteerd projectonderwijs*. Enschede. Tech Your Future.