

Interdisciplinarity

kick-off - a discussion about interdisciplinary work

a world full of problems

We live in a world full of problems. They might be small, big or even wicked [1]. Trying to solve them often demands different areas of expertise working together. Working in a group can be challenging. Working in a group with people from different disciplines can be sometimes overcharging. Additionally, people tend to think their work is interdisciplinary while in fact it is multi or cross disciplinary. Therefore, before dealing with those challenges and discussing possible solutions, a definition of the distinct disciplinarity[2] is required.

a definition

The table below lists the different disciplinarity increasing by the complexity of the integration of other disciplines [2][3].

Type	Description	Example	Visualization
intra	one single discipline	several carpenters build a wooden cabin	
cross	linking two (rarely more) disciplines	art —> art history	
multi	several disciplines working together - everyone remains working in their field of expertise	a group of different builders (electricians, painters and an architect) build a house	
inter	integrating approaches from several disciplines	designers using problem solving strategies from computer science	
trans	developing new integrated frameworks, regardless of the discipline	the Planetary Collegium at Plymouth University[4]	

The major differences are: a) the way how members of one discipline look at members of another discipline and b) how they work together, meaning how they interconnect, how they communicate and are able to make their ideas, work and solutions useful for others in

order succeed and solve the problem. It seems that multi disciplinary work, for instance as in the builders example or in an orchestra, doesn't present us with great difficulties, as we are used to this kind of work. Yet, sometimes this approach/disciplinarity might not sufficient to achieve the desired goal.

three arguments

Marilyn Stember[5] suggests three major arguments for interdisciplinary work (in the social sciences).

- The intellectual argument: problem solving ideas in any discipline are enriched by theories, concepts, and methods from other fields.
- The practical argument: our most urgent problems (e.g. climate change) are not organized in disciplines.
- The pedagogical argument: professional life and the tasks in it, regardless the context, require problem solving in interdisciplinary teams. Therefore this kind of work has to be taught in school/academy.

problems

Before the Age of Enlightenment in the 17th and 18th century, there was the polymath, in other words, a transdisciplinary scholar. Knowledge from various disciplines was taught and learned. However, the (modern) world became too complex, so science (as we know it) developed, including a wide range of disciplines [6]. Splitting up in rather separate disciplines caused a dilemma, as it required to solve the puzzle by again putting together the small pieces, to understand the world as a whole. Yet, this is a task too complex to succeed. Inter- and transdisciplinary teams are one attempt to encounter this impossible task.

Those teams face several problems when working together, which can be broken down to one mayor issue: communication. Each discipline usually comes with its own background, like its history, approaches in teaching, problem solving strategies and even its own terms. Science itself, has a different meaning in different disciplines, e.g. in Physics and in the Arts (artistic research) science and research are carried out differently. Marketing specialists developed their own special language [7], like: „The customer must burn at the POS“. The

more diverse a team is, the more difficult is communication. In an orchestra for example this problem might not occur, because a singer, a conductor and a pianist have a different educational background, but their vocabulary is still the same.

Surely, not only communication might be an issue. It is also about what kind of and how problem solving strategies are applied and what workflow is expected. Another example: when coming together for a first meeting to discuss the content for a new joined curriculum, a designer will probably show up without a finished plan or solution, as he/she might expect to discuss and brainstorm together with the others in the team. A computer scientist on the other hand would probably come with an elaborate plan and proposition at hand. We are not here to judge! Neither approach is better or worse than the other. However, to communicate and to find a common starting point might be already difficult as the designer assumes the propositions made are just basic ideas and a matter of discussion, while the computer scientist might assume a freely interposed suggestion or buzzword by the designer is a full-blown plan. A fruitful ground for misunderstanding.

solutions

Again, the work of Marilyn Stember[5] suggests several approaches to solve these problems.

- appropriate group members must be/have: dedicated, specialists in their field, soft skills, commitment, leadership/mediator skills.
- establishing ground rules: they depend on the topic, however every team member should be granted a time for free exploration and sharing ideas with the others.
- explicating and bridging epistemological and methodological differences - especially investing time and effort in exploring what the discipline is able to offer for the process. Prepare cognitive maps, which include basic concepts, modes of inquiry, what counts as a problem, representation techniques, standards of proof, types of explanation, and general ideals of what constitutes the discipline. Cultivate diversity and the personal backgrounds of the team members.
- promoting infrastructural support in schools/academies

Apart from those suggestions made by Stember, we as individuals, in our professional life should support and promote working and teaching in interdisciplinary teams more vigorous. Curricula and our own way of teaching must change to more diverse and integrating approaches which broaden the perspective for our students as this is one way to tackle our most urgent problems on the planet.

further questions/discussion

- Which disciplinarily would be an orchestra?
- Why do we still teach (at school and university) in subjects and separated disciplines, although we know that interdisciplinary work is undoubtedly required to solve our most urgent problems?
- Why is it so hard for us to accept other peoples opinions and ways of problem solving, which are different from ours?

References (in order of appearance)

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