A Method for Describing Declared Teamwork Instruction in a CS Bachelor Curriculum

A reusable method, demonstrated on one CS bachelor curriculum (KTH Datateknik) using the Garcia (2024) framework

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1. Problem

Industry reports that CS bachelor graduates lack teamwork skills [1], even though programmes are formally expected to develop it.

A reported gap like this could start at one of three levels: industry's own expectations, the step from what is taught to what students retain, or the declared curriculum (what a programme officially commits to teach).

For that declared layer, there is no established, repeatable way to check whether a programme builds teamwork across its full mandatory curriculum, or only in one or two courses.

2. Research question

How is teamwork represented across a CS bachelor curriculum's full mandatory load?

SQ1. Which categories does the curriculum declare?
SQ2. Which categories are absent?
SQ3. Which declared content do current categorisations miss?

3. Method (the contribution)

Input. A programme's public course syllabi for its full mandatory load, with structured fields such as intended learning outcomes, content, and examination.

Instrument. A teamwork framework covering professional dispositions, non-technical skills, and collaborative teaching methods (Garcia 2024), reduced to a defined teamwork-relevant subset.

Two kinds of misfit are tracked. Type-1 is a framework category never declared anywhere; Type-2 is declared content the framework does not capture.

Output. Which teamwork categories the curriculum declares, omits, and declares beyond the framework, read against the curriculum's structure (years, course types, the capstone).

Teamwork-relevant subset coded

Dispositions: Collaborative, Responsible

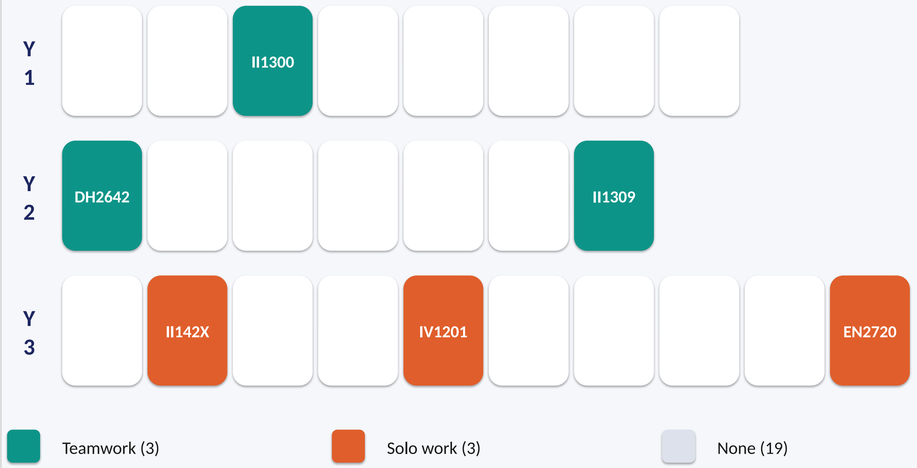
Skills: Communication, Conflict resolution, Leadership, Role awareness, Teamwork/dynamics

Methods: group project, pair programming, peer review, scrum

Reliability: an intra-rater re-code of about 30% of the courses reached 90% agreement.

4. Demonstration: findings (KTH)

Curriculum map: all 25 mandatory courses, by year



Teal courses (teamwork) sit only in years 1 and 2 and are all project courses. Orange courses (solo work) are all in year 3, including II142X, the 15-ECTS capstone. The concentration is visible only at the curriculum level, not from any single course.

Table 1. Programme-level fit and misfit summary

Question / pattern	Finding	Count
SQ1, present	Teamwork declared in ILO or Content	3 / 25
SQ2, Type-1	No substantive teamwork in ILO or Content	19 / 25
SQ2, individual	Course declares solo work	3 / 25
SQ2, schema	No Teaching-Methods field in the syllabus	25 / 25
SQ3, Type-2	Unmapped: individual accountability	2 / 25
Pattern A	Ethics boilerplate mismatched with content	21 / 25
Pattern B	Project graded, individual vs group not stated	3 / 3

5. The boilerplate problem

The 'ethical approach' field is identical, word for word, in all 25 syllabi, and it always refers to group responsibility, even in courses that are individual:

'All members of a group are responsible for the group's work. In an oral assessment, every student shall be able to present and answer questions about the entire assignment and solution.'

21 / 25 courses are boilerplate mismatches

For example, the II142X capstone is declared as an individual project, yet still carries this group text. It is an institutional template, not course-level evidence, and must be discounted before coding.

6. What it means

On this programme, the curriculum cannot be ruled out as a source of the teamwork gap. Teamwork is declared in only 3 of 25 courses and the capstone is individual, so a graduate weak at teamwork may never have practised it.

Programme designers
Make teamwork a thread declared, practised, and assessed across courses, and check the capstone matches that intent.

Accreditation bodies
Ask programmes to show where, across the full mandatory load, teamwork is declared and assessed.

Researchers
Reuse the method to map other curricula and build a cross-programme picture.

Beyond CS
The same method fits any programme with structured public syllabi, not only computing.

7. Contribution & limitations

Contribution. A reusable method and codebook that any programme can apply to its own curriculum, to check whether teamwork is built across the whole curriculum or confined to a few courses. The KTH study is the demonstration, not the contribution.

Limitations

- One programme (a single demonstration).
- One coder: intra-rater 90% agreement, no inter-rater check.
- The declared layer only, not what happens in class.
- Bounded by the syllabus schema and the framework's vocabulary.