Combining Social and Epistemic Network Analyses To Study Teachers' Communities of Practice
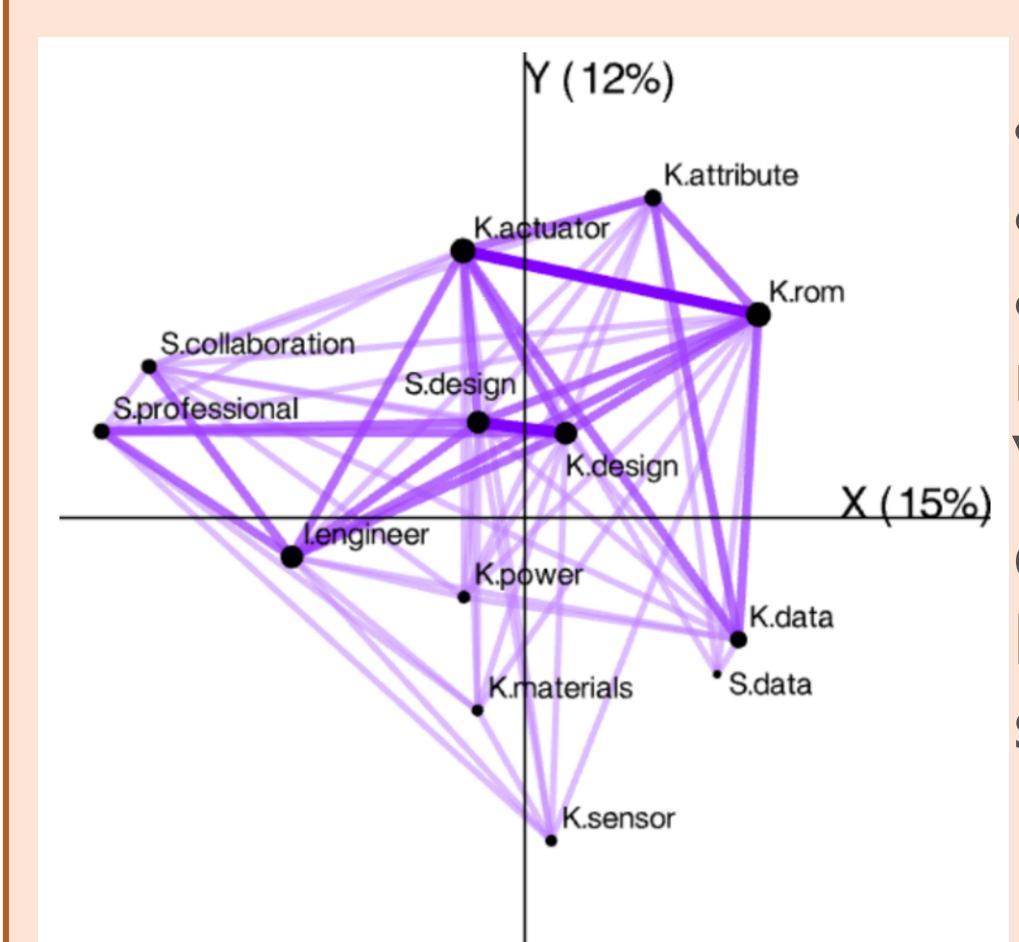
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The Problem

- Whole network studies with Mixed Method SNA (MMSNA) in educational context have been successful in examining how innovation spreads through the interactions among individuals by more diverse interactions.

- Such studies included randomly sampled interviews to explain what 'flows' through the network but such approach has limited generalisability to the whole network (Daly, Moolenaar, Bolivar, et al. 2011; Moolenaar, Sleegers & Daly 2012).

- The pitfall of any MMSNA is that the **qualitative methods are not designed for building network models** which limits the ability of a researcher to compare the relationship between the observed structure of relations and what 'flows' through those relations.

Epistemic Network Analysis

- Epistemic Network Analysis (ENA) is a versatile method that involves techniques for **quantifying qualitative data** and presenting it as **network data**.

- **The strength** of this technique is the ability to analyse narratives taking advantage of statistical tests to measure co-occurrences of 'codes' (themes or categories) and changes in discourses across time or between groups and test their statistical significance (Shaffer, 2017).

Fig.1 Cognitive network of a first-year student of engineering representing connections made while solving a design problem. The analysis is based on conversations student had while collaborating with others in their group. Thicker lines indicate stronger connections (Shaffer, 2017).

Combining SNA and ENA

The purpose of combining Social and Epistemic methodologies is to simultaneously examine the relationship between properties of epistemic and social network e.g. tendency for clustering can be measured from tie analysis of interactions and content of those interactions.
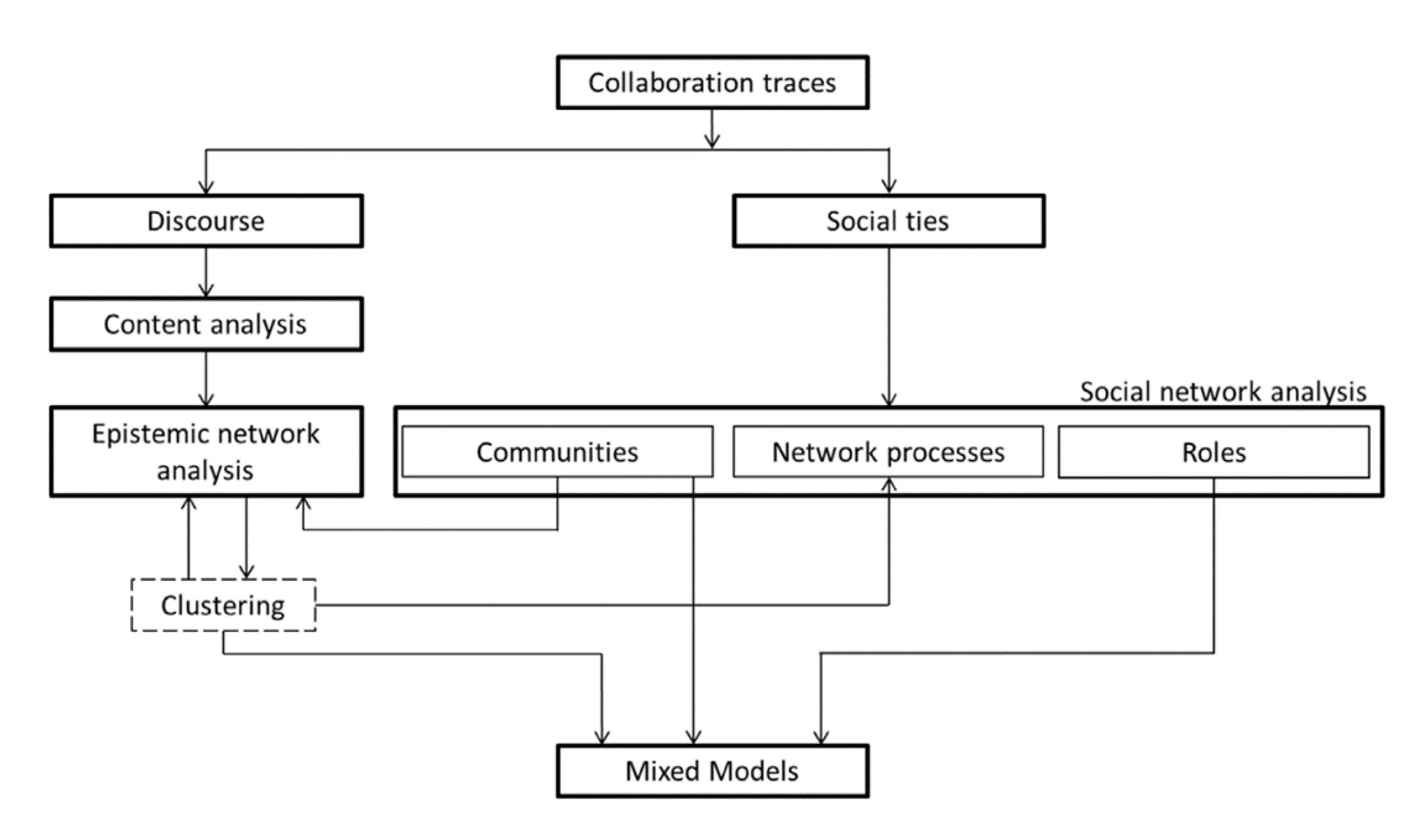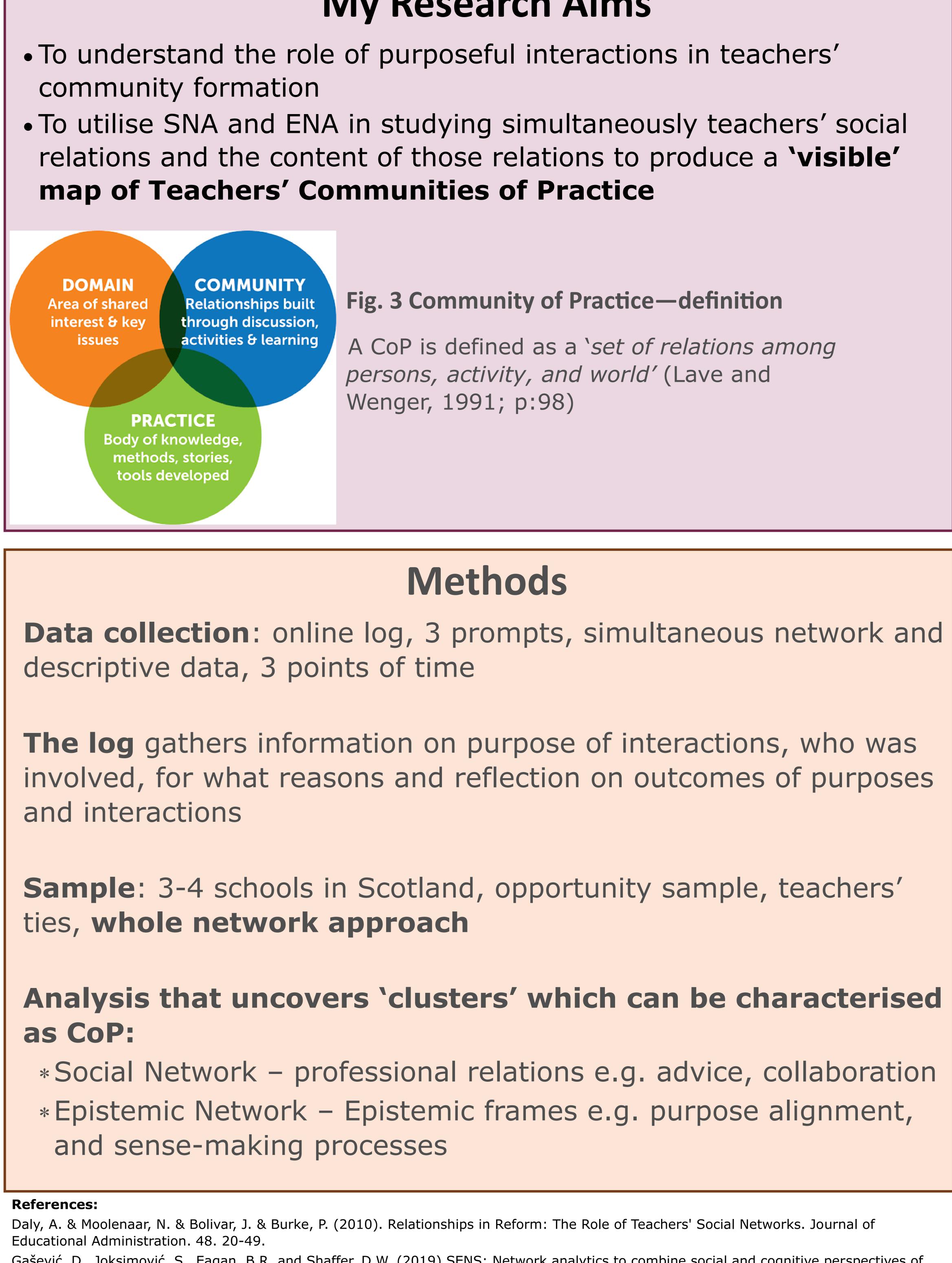

Fig. 2 Methodological steps to combine SNA and ENA (Gašević, Joksimović et al. 2019).

The combined SNA and ENA was first applied in a massive open online course to study collaboration and learning performance analysing relations and content of chats (Gašević, Joksimović et al. 2019).

First application in real school context was by Pantić, Galey et al. (2020) to study teacher agency for inclusive pedagogy where they developed online tool to simultaneously collect teachers ego network and epistemic data.

My Research Aims

- To understand the role of purposeful interactions in teachers' community formation
- To utilise SNA and ENA in studying simultaneously teachers' social relations and the content of those relations to produce a **'visible' map of Teachers' Communities of Practice**

Fig. 3 Community of Practice—definition

A CoP is defined as a 'set of relations among persons, activity, and world' (Lave and Wenger, 1991; p:98)

Methods

Data collection: online log, 3 prompts, simultaneous network and descriptive data, 3 points of time

The log gathers information on purpose of interactions, who was involved, for what reasons and reflection on outcomes of purposes and interactions

Sample: 3-4 schools in Scotland, opportunity sample, teachers' ties, **whole network approach**

Analysis that uncovers 'clusters' which can be characterised as CoP:

* Social Network – professional relations e.g. advice, collaboration
* Epistemic Network – Epistemic frames e.g. purpose alignment, and sense-making processes

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