What are students actually saying?
The Teacher-Scholars Program

Create Vertical Learning Communities to Facilitate Scientific Discussion in General and Organic Chemistry Courses

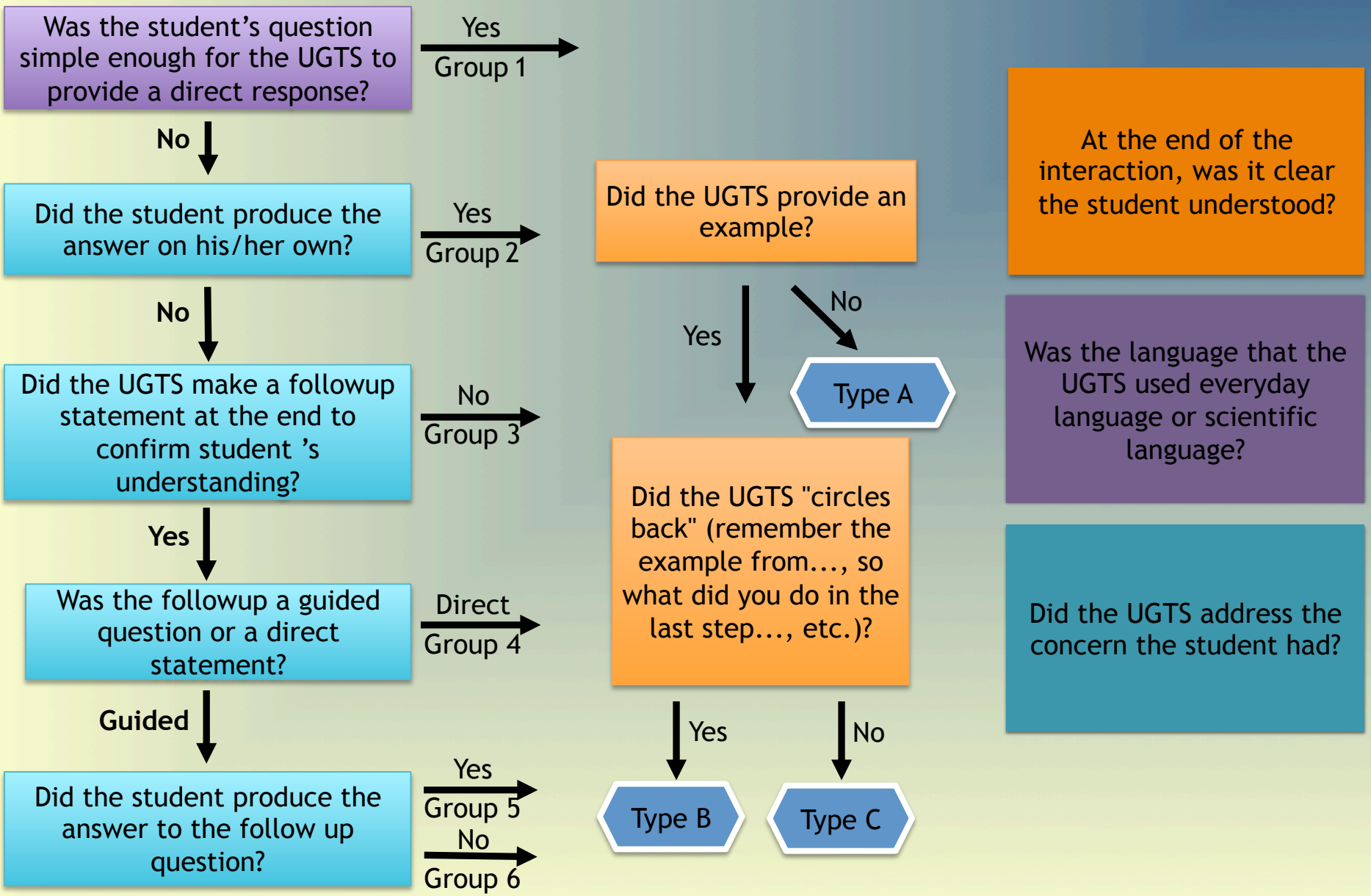
- Teacher-Scholars: Undergraduates, who have completed General or Organic chemistry, co-teach laboratory and discussion sections for credit
- Teacher-Scholar integrated into course curriculum and teaching staff
  - assigned to 3-5 hour lab section or 2-3 discussion sections
  - Invited to GSI meetings
  - 1 hour preparation for teaching
  - 1.5 hour pedagogy course
- Intended Outcomes
  - Improved learning, experiences, and attitudes
  - Community building
  - Improved leadership, communication, and teaching skills
- Developed based on earlier shadowing programs and published literature

Sara Tischhauser, MaryAnn Robak, Pete Marsden, Anne Baranger

What are students actually saying? Content Knowledge

Score	Things to look for	Examples
S	• More than what we would expect in the lab context • Extra knowledge which promotes thinking • Discussions lead to higher level explanation about the students' concern	So you have like, you know, a little bit of water and a little bit of biodiesel like everywhere but you don't want water, right? You want pure biodiesel. So that's why when you put NaCl in, water does this thing where it hydrates, it hydrates NaCl, right? The ions …It surrounds the ions, right? So it, NaCl selectively pulls water out of the system.
A/B	• Perfect or Good: • Explains WHAT is happening AND/ OR • Explains WHY it is happening in the context of the experiment	A: Defines weight %, gives mathematical example. B: So, yes, there is mostly water in there.
C	• Misguiding or vague information	$MgSO_4$ is way polar. Hum, If you know sulfuric acid, H_2SO_4, is like one of the strongest acid we have.
D	• Wrong calculation or Wrong method • Unable to answer or defers question to someone else.	Doesn't know what t-butanol is, tells student to Google information.

What are students actually saying? Pedagogy



Preliminary Findings

- TS content test knowledge increases significantly over time
- The majority of TS interactions earn content knowledge scores >C
- Average number of turns per interaction: 12
- Average number of turns between student question and TS answer: 4
- Majority of TS's speak to only 1 lab partner at a time (group conversations are rare)
- Majority of TS provide direct statements rather than leading questions
- Rarely clear that student has adopted the normative way of thinking at the end of an interaction