Student Experience of First Year Physics Labs

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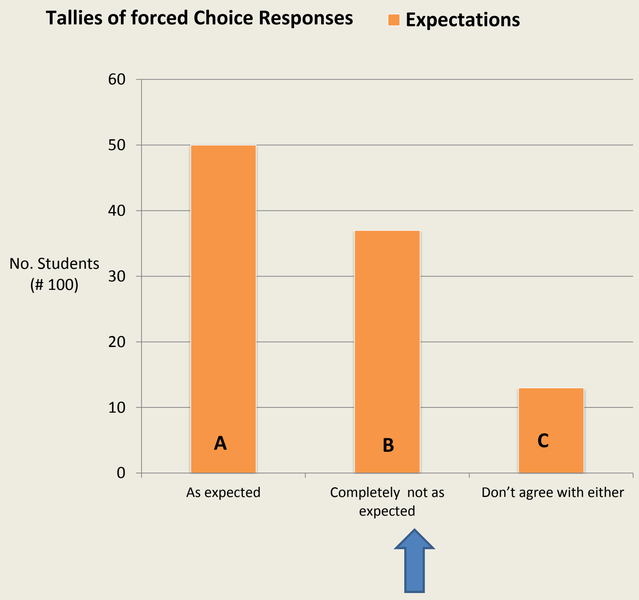
Sample

- 100 students in the extended non-major physics course
- Attends five 45 min lectures per week; one lab afternoon alternating with tutorials (3 hours)
- Had attended a total of 6 lab sessions when the questionnaire was administered.
- These are students who made the decision to continue a one semester mechanics course over a period of two semesters
- Probe students experience of lab to date

Expectations Forced Choice responses



Q.1. A group of students discuss their <u>expectations</u> regarding the physics labs.

Student A says, "So far the labs have been what I expected they would be".

Student B says, "I don't agree! The labs turned out to be completely not what I expected".

Student C says, "I do not agree with either of you!

- *With whom do you most closely agree? (Circle one)*
- *Explain your choice in as much detail as possible*

Instrument: (PoPLQ)

Instrument constructed to probe perceptions of the following areas

- Expectations
- Enjoyment
- Learning
- Relationship of lectures (theory) with labs
- View about relationship of experiment versus theory in physics

Form of the instrument

- Questions framed as debates
- Responses:
  - Forced Choice + Written Explanation

Enjoyment Forced Choice responses

Q.2. Another group of students are debating how much they <u>enjoyed</u> the labs.

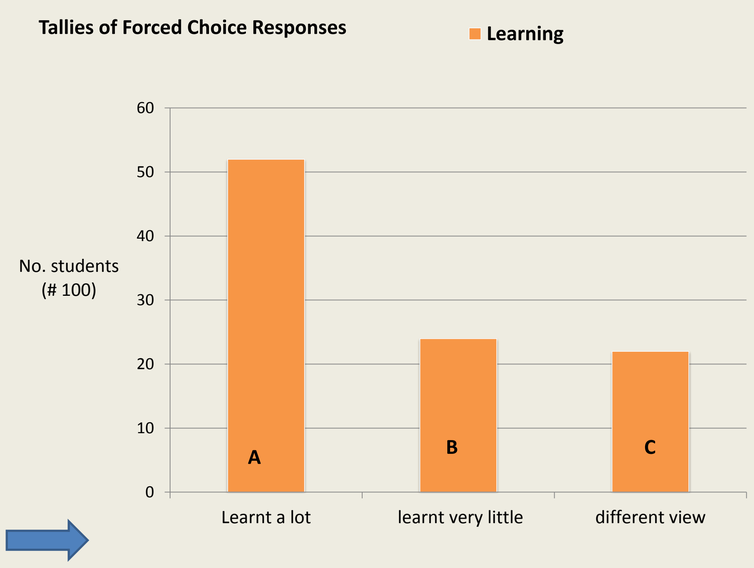
Student A says, "I really enjoyed the labs!"

Student B says, "I did not enjoy the labs in the least!"

Student C says," I don't agree with either of you!"

- *With whom do you most closely agree? (Circle one)*
- *Explain your choice in as much detail as possible.*

Learning Forced Choice Responses



Q.3. A third group of students argue about what they <u>learnt.</u>

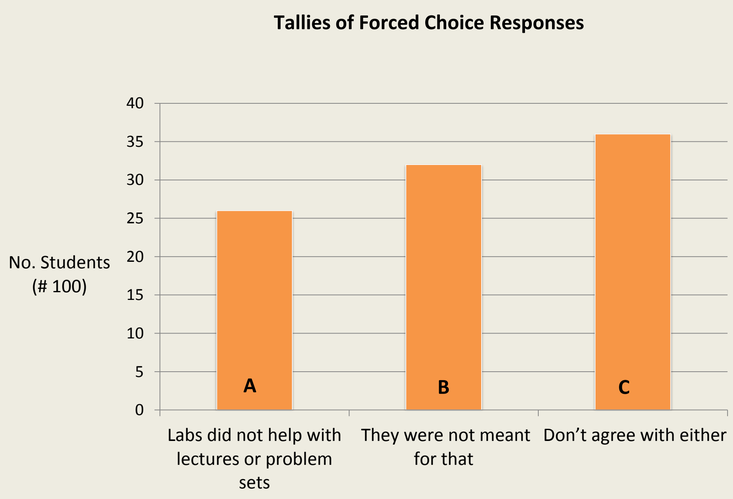
Student A says," I learnt a lot in the lab!"

Student B says," No! I learnt very little in the lab".

Student C says," Hang on, I have a different view to both of you".

- *With whom do you most closely agree? (Circle one)*
- *Explain your choice in as much detail as possible.*

Lectures (theory) with Labs FCR



Q.4. Three students are arguing about <u>the lab versus the theory part of the course.</u>

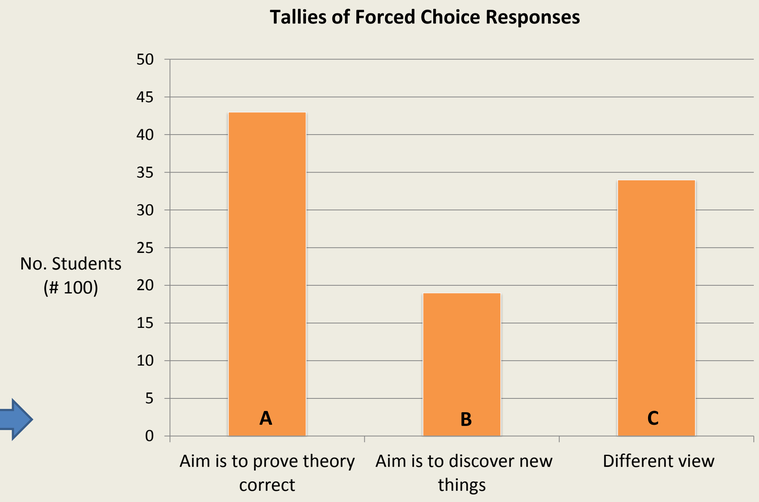
Student A says, "I did not like the labs as they did not help us with lectures or problems sets".

Student B says, "You are confused! The labs were not meant to do that in the first place".

Student C says, "I don't agree with any of you!"

- *With whom do you most closely agree? (Circle one)*
- *Explain your choice in as much detail as possible.*

Experiments and Theory in Physics FCR



Q.5. A group of students disagree about <u>the experiments and theory</u>.

Student A says, "The main aim of experiments in physics is to prove the theory correct".

Student B says, "No! The main aim of experiments in physics is to discover new things".

Student C says, "I have a different view to both of you".

Analysis of written responses for enjoyment and learning questions: Emergent categories from grounded theory

Socio-emotional category 1: "Negative role of marks"

- I wouldn't say I really enjoyed the labs but I do enjoy the labs. Even though sometimes I get marks of a lower pass they encourage me to do better next time. [193: Q2 (Enjoy); FCR: C]
- There is very little learning for me in the lab, I would rather understand the purpose of doing the practical, but I feel that it is not so, that we in it for the marks. I always manage to walk out of the lab clueless. [164: Q3 (Learn); FCR: B]
- At first, labs seemed interesting until learning has marks, shift trying to understand what the experiment is about, and to obtaining marks. labs are less fun and have become a burden. Those who have never used labs before are disadvantaged, even with tutors there to help, since basics of labs aren't taught; we learn by doing more experiments at cost of marks. [156: Q2 (Enjoy); FCR: B]

Socio-emotional category 2: "Relationships"

- So far I can not say I enjoyed the labs as I get to encounter a lot of challenges. My situation has turned out to be that of feeling a bit oppressed and undermined by fellow students. It came to a point where in you fear to speak your mind out or talk confidently […] [161: Q 2 (Enjoy); FCR: B]
- Sometimes I learn sometimes I don't. […] Sometimes peer take you for granted- end up feeling down and loosing track; working alone would be better. [187: Q3 (Learn); FCR: C]
- The lab sessions provide the opportunity to work with other fellow students. Where everyone has their own ideas; when those ideas are combined then a well thought of lab session can be represented. [107: Q2 (Enjoy); FCR: A]

Summary

1. Designed an Instrument, PoPLQ to probe students' perceptions of the lab experience.
2. Results from enjoyment and learning probes indicate a non-congruent relationship.
3. Preliminary results of student writing show two distinct emergent categories:
- Knowledge and skills (positive and negative)
- Socio-emotional (positive and negative)

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