Conceptions of Learning and Teaching for Faculty who Teach Basic Science

Helena Carvalho, Department of Basic Science Education. Francis C Dane, Department of Psychology, Radford University, Shari A. Whicker, Office of Continuing Professional Development, Carilion Clinic and Virginia Tech Carilion School of Medicine

Introduction

Approaches to teaching can be placed on a continuum that ranges from teacher-centric (focus on knowledge transmission) to student-centric (focus on conceptual change in students). An educator's conception of learning and teaching impacts how they approach teaching and, ultimately, how students learn. We hypothesized that faculty with more dedication and experience in teaching would be student-centric, electing to use teaching modalities that promote active learning.

Goal

Our goal was to assess faculty conceptions of learning and teaching and how they might be related to the time dedicated to teaching as well as their choice of teaching methodologies.

Methods

This was a cross-sectional study using survey methodology. We collected quantitative data through an anonymous survey of 130 faculty members who taught Basic Science (BS) content in the 2018 academic year at Virginia Tech Carilion School of Medicine (VTCSOM).

We utilized the COLT, a published survey instrument (Jacobs et al., 2012) that includes 3 scales: 1) Teacher-centeredness (TC); 2) Appreciation of Active Learning (AL); and 3) Orientation to Professional practice (OP).

Non-identifiable demographic information such as teaching experience, degree, and preferred teaching methodologies was collected.

Instrument reliability was assessed with Cronbach's alpha. Correlation and Chi Square testing were used to examine relationships between variables and Analysis of Variance to examine group differences.

Results

- 40% response rate on survey (50 out 130)

Cronbach's alpha

- Teacher centred (TC) = 0.731
- Appreciation to active learning (AL) = 0.608
- Orientation to practice (OP) = 0.730

Subscale Correlations

- TC is negatively correlated with both AL (-0.312) & OP (-0.197)
- AL and OP are highly correlated with each other (0.602)

Demographics

- 47% female, 50% male, 3% no response
- 63% MD, 25% PhD, 5% PharmD, 7% other
- 51% assistant, 27% associate, 20% professor, 2% other
- Age from 30yo-65yo with most (43%) between 40-49yo.

Teaching Experience

- > 10 years – 62.5%
- 5-10 years – 27%
- < 5 years – 10%

The amount of time currently dedicating to teaching varied depending on the individual and also the time of year. Median of 6.0 hours (interquartile range = 18) per year.

Teaching disciplines and modalities

- 17 disciplines listed and 21 teaching modalities reported.
- Majority faculty lecture (80%) interspaced with case-based (64%) and small group discussion (26%).
- More variety of teaching styles were observed among faculty with a lower score in TC (r = -.323, p = .022), a higher academic rank (r =.401; p=0.006), and more time teaching (r=.483; p=0.001).

Overall COLT scores	Value
Teacher Centred (TC)	3.12 ± 0.6
Appreciation for Active Learning (AL)	4.06 ± 0.41
Orientation to Practice (OP)	4.2 ± 0.45

COLT scores

- Overall BS faculty score lower in TC than AL ($p < .001$, partial $\eta^2 = .588$) regardless of gender, academic rank, degree, and teaching experience
- Younger faculty (30-39 y.o.) scored lower than older (50-59 y.o.) on TC ($F=3.29$; $p=.027$).

Discussion and Conclusion

Faculty appreciated active learning to a greater extent than teacher-centered (TC). Regardless of overall low score in TC, the majority of faculty use lectures, which are traditional faculty-centric pedagogy, but most faculty lectures are interspersed with other student-centric teaching modalities such as case-based and group discussion.

Teaching experience is not related to COLT but it is correlated with choice of teaching methodology. A more experienced faculty, with higher rank and more time teaching, use more teaching modalities. Also, the use of diverse teaching methods is correlated with a lower score on teacher-centered.

Reference:
Jacobs, J.C.G., Van Luijk, S. J., Van Berkel, H., Van der Vleuten, C.P.M., Croiset, G., & Scheele, F. (2012). Development of an instrument (the COLT) to measure conceptions on learning and teaching of teachers, in student-centred medical education. *Medical Teacher*, *34*(7), e483–e491. https://doi.org/10.3109/0142159X.2012.668630

Virginia Tech Carilion School of Medicine

helena@vt.edu