

TRANSFORMATIVE LEARNING

Transformative Learning Assessment: What Happens After Class?

The [Transformative Learning article in the December 2012 issue of Transformative Teacher-Scholar](#) included this quote from an article by Sinatra, Brem, & Evans (2008) as a goal in biology education concerning evolution:

“. . . helping [students] see the world in new and different ways.” (p. 189)

Biology educators appreciate the challenges inherent in helping students see the world and the way it came to be differently and without misconception. Effecting a change in a student's worldview such that she sees the world differently results in Transformative Learning by the student.

How do biology educators assess the degree to which this happens?

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First, as in any discipline, biology educators understand they cannot *make* Transformative Learning happen:

Science educators cannot directly *cause* transformative experiences, but they may play a critical role in inspiring them. Expanding our understanding of transformative experiences can help achieve this goal. (Pugh, Linnenbrink-Garcia, Koskey, Stewart, & Manzey, 2010, p. 21)

But knowing they can *inspire* transformative experiences, and that such experiences are necessary for some students to change their perspectives sufficiently to engage with concepts like natural selection and evolution, biology educators are very interested in learning how well they inspire TL.

Pugh, *et al.* (2010) posited that transformative experiences often lead to some change in what the student does outside of class (p. 4). The authors define the qualities of a transformative experience thusly:

. . . transformative experience can be conceptualized as a continuum ranging from in-school engagement to out-of-school engagement. Thus, the qualities of motivated use, expansion of perception, and experiential value may first emerge as in-class forms of engagement. . . . Over time, these in-school forms of engagement may develop into the out-of-schools forms of education envisioned by Dewey (1938). (Pugh, *et al.*, 2010, pp. 4-5)

The authors' research study involved a pre/posttest design, and because they were seeking information about the degree to which students moved along their theorized continuum for transformative learning, they had to use some sort of scale to track that

student movement. A survey previously devised by two of the authors was the instrument used (Pugh, Kleshinski, Linnenbrink, & Fox, 2004).

Because “expansion of perception” is one of the characteristics of Transformative Learning as discussed here at UCO, readers may find the questions in the survey’s “Expansion of Perception Items” category of interest. Though these questions are targeted to elicit student perceptions about biology as related to the concepts of adaptation and natural selection, their wording is evocative for considering how one might gauge student perceptions of other concepts in other disciplines.

Expansion of Perception Items

- 13 During science class, I see things in terms of adaptation and/or natural selection.
- 14 When I am working on a class assignment about certain animals or plants, I tend to think of them in terms of adaptation and/or natural selection.
- 15 I notice examples of adaptation and/or natural selection during science class.
- 16 If I see a really interesting animal or plant (either in real life, in a magazine, or on TV) then I think about it in terms of adaptation and/or natural selection.
- 17 I notice examples of adaptation and/or natural selection outside of class.
- 18 I look for examples of adaptation and/or natural selection outside of class.
- 19 I can’t help but see animals and/or plants in terms of adaptation and/or natural selection. (Pugh, *et al.*, 2010, pp. 21-22)

This study involved 9th- and 10th-grade biology students at two schools, one a public school and one a religiously-affiliated school. Using pre/posttest survey results and applying regression analysis and Rasch analysis methodologies, the authors state:

With respect to students’ conceptual change as a function of transformative experience, transformative experience predicted conceptual change with respect to the natural selection misconception at both the posttest and follow-up assessments. These results are consistent with prior experimental studies . . . (Pugh, *et al.* 2010, p. 19)

It’s interesting to consider the authors’ contention that a transformative learning experience likely means students have out-of-class thoughts about the conceptions they’ve wrestled with in class. For out-of-class TL experiences themselves, such as a study tour or the Asian Moon Festival or being a member of an athletic team, the “out-of-class” aspect simply means after the event or experience.

But it makes sense. If a student’s perception of herself and her relationship with others has been expanded as a result of something that happens in your classroom, she’s just about guaranteed to think about it outside of your class.

References

Dewey, J. (1938). *Experience and education*. New York, NY: MacMillan.

Pugh, K. J., Kleshinski, O., Linnenbrink, E. A., & Fox, C. M. (2004, April). Transformative experiences in science: Using Rasch to develop a quantitative measure. Paper presented at the American Educational Research Association Annual Conference, San Diego, CA.

Pugh, K. J., Linnenbrink-Garcia, L., Koskey, K. L., Stewart, V. C., Manzey, C. (2010). Motivation, learning, and transformative experience: A study of deep science engagement. *Science Education*, 94(1), 1-28.

Sinatra, G. M., Brem, S. K., & Evans, E. M. (2008). Changing minds? Implications for conceptual change about teaching and learning about biological evolution. *Evolution: Education and Outreach*, 1(2), 189–195.