

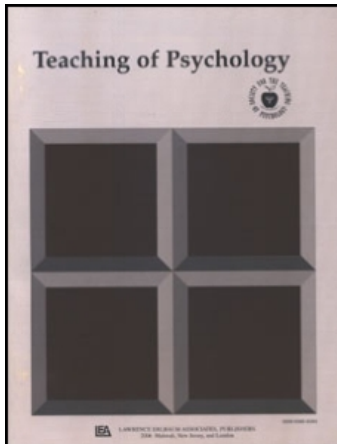
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Encouraging Epistemological Exploration: Impacts on Undergraduates' Retention and Application of Course Material

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Students bring an intact, if unarticulated, epistemological perspective into the classroom that influences how they receive and process new information. In this study, students who explored a wider range of perspectives had significantly improved learning outcomes as measured in 3 domains: retention of specific content, retention of general themes, and application of the course content to other courses, mass media information, and their sense of self.

A primary goal of undergraduate psychology education is teaching students about a given content domain. However, in addition to the topics of our lessons, we also impart the epistemological perspective of psychological inquiry. Epistemology can be defined as a framework for organizing and comprehending knowledge, regardless of specific content (e.g., Greco, 1999). Students come to class with an intact, if often unarticulated, epistemology that they use in learning new material (e.g., Hofer, 2004; Lidar, Lundqvist, & Östman, 2005). These personal epistemologies can be influenced through interactions with teachers in the classroom, but often both teachers and students overlook this aspect of instruction. Contributions from both educational theory and empirical research converge to suggest that heightening students' awareness of their implicit epistemological perspectives, clearly articulating the epistemological context of a given course, and striving to present a range of epistemological perspectives on a single topic augments knowledge retention and facilitates application across multiple domains (e.g., Kuhn, Cheney, & Weinstock, 2000; Loving, 1997; Meyling, 1997; Preston, 2005; Schraw, Crippen, & Hartley, 2006; Yerrick, Pedersen, & Arnanon, 1998). This article describes one attempt to

put this pedagogical goal into practice by encouraging epistemological exploration.

Our example is drawn from a team-taught psychology seminar course on the topic of identity. A comprehensive description of the course is beyond the scope of this article. Instead, we focus on aspects of the course specifically designed to assess and influence students' epistemological perspectives.¹

The course had three epistemological objectives. First, we wanted students to identify their own implicit practical epistemology (e.g., Lidar et al., 2005) on the topic of identity. Second, we worked to engage students with a range of epistemological perspectives on identity. Third, we asked students to analyze and articulate their evolving epistemological perspectives in light of the broad range of perspectives covered in the course.

We designed an assessment technique, labeled the Identity Inventory (I.I.), in the service of these three objectives. The I.I. consisted of one item on a bipolar mind–brain continuum; students were asked to mark where they thought identity originated on the scale. We constructed the I.I. to force students to take a position each week, and it was designed free of anchor points to avoid facilitating responding based on previous responses. Students completed the I.I. at the beginning of one class session each week.

Following the literature on the benefits of epistemological exploration (e.g., Loving, 1997; Meyling, 1997; Preston, 2005; Schraw et al., 2006), we empirically assessed the relationship between students' longitudinal

¹The authors can provide a comprehensive description of course content and reading materials via e-mail.

experimentation with different epistemologies and the impact of the course. Our hypothesis was that one academic term following the course's conclusion, those students whose responses on the I.I. varied the most over the academic term would retain the most information from the course (both specific content and major themes) and would report applying the lessons of the course in a variety of other important domains.

Method

Participants

Participants were 27 first-year undergraduates (13 men) enrolled in a course about identity during one of two academic terms. Five students did not return the assessment questionnaire and were not included. Non-participants were not different in gender, final grade, or variability on the I.I.

Materials

We assessed exploration of different epistemological perspectives using the I.I., gauging evidence of experimentation by the range of responses on the I.I. during the academic quarter. Responses could vary between 0 and 12. A single score representing the range of each individual's I.I. responses was computed ($M = 4.91$, $SD = 2.28$). The maximum variation was 10.40 and the minimum variation was 0.70, measured in centimeters on the scale from one pole. This method of operationalizing epistemological experimentation produces one score on variability, by distilling each individual's trajectory over the course of the academic semester. In doing so, it treats epistemological experimentation as a process (as evidenced by high variability scores) as opposed to an endpoint (a particular destination on the I.I.). Thus, we operationalized epistemological exploration via a single score indicating the range of students' engagement with different perspectives, not with the ultimate adoption of any particular epistemological position. An example of two students with different patterns of variability on the I.I. is presented in Figure 1. Student 1 rarely wavered from his or her epistemological position, whereas Student 2 experimented with a wide range of perspectives.

Procedure

We assessed effect of the course using a questionnaire administered to students one academic term fol-

lowing completion of the course. An independent rater from Northwestern University's Center for Teaching Excellence used rubrics that the instructors developed to score the questionnaire. The questionnaire assessed three domains. We measured retention of specific content and major themes of the course with six free-response questions that were scored using a rubric on a 0 (*no retention*) to 3 (*perfect retention*) scale ($M_{\text{specificcontent}} = 2.05$, $SD_{\text{specificcontent}} = 0.57$; $M_{\text{majorthemes}} = 2.18$, $SD_{\text{majorthemes}} = 0.52$). We assessed students' application of the course through three items designed to tap different domains of applications (e.g., To what extent did this course impact your approach to learning in other courses?). Students responded to each item on a 1 (*very little*) to 6 (*very much*) scale ($M_{\text{application}} = 4.15$, $SD_{\text{application}} = 0.80$). The numerical responses to these items were averaged to create a composite, labeled application of course ($\alpha = 0.81$).

Results and Discussion

Results supported our primary hypothesis. The more students showed variability on the I.I. over the course of the academic term, the more they evidenced retention of specific content ($r = .41$, $p < .05$), major themes ($r = .44$, $p < .05$), and application of course material in other important domains ($r = .47$, $p < .01$). Those students at the higher end of the spectrum of epistemological exploration during the academic term not only retained more information from the course but also reported a greater impact of the course on other domains of thought. It is worth noting that all of these relationships remained significant while controlling for students' specific I.I. scores from the beginning of the semester (specific content partial $r = .32$, $p < .05$; major themes partial $r = .38$, $p < .01$; application partial $r = .39$, $p < .01$), from end of the semester (specific content partial $r = .33$, $p < .05$; major themes partial $r = .38$, $p < .01$; application partial $r = .38$, $p < .01$), as well as their I.I. score at the follow-up assessment (specific content partial $r = .29$, $p < .05$; major themes partial $r = .31$, $p < .05$; application partial $r = .33$, $p < .05$). In other words, the relationships between epistemological exploration and knowledge retention and application remained significant, regardless of the particular epistemological perspective students held at any given point.

It is also noteworthy that student variability on the I.I. was not significantly correlated with the final grade in the course ($r = .07$, $p = .73$). Instead, students' final

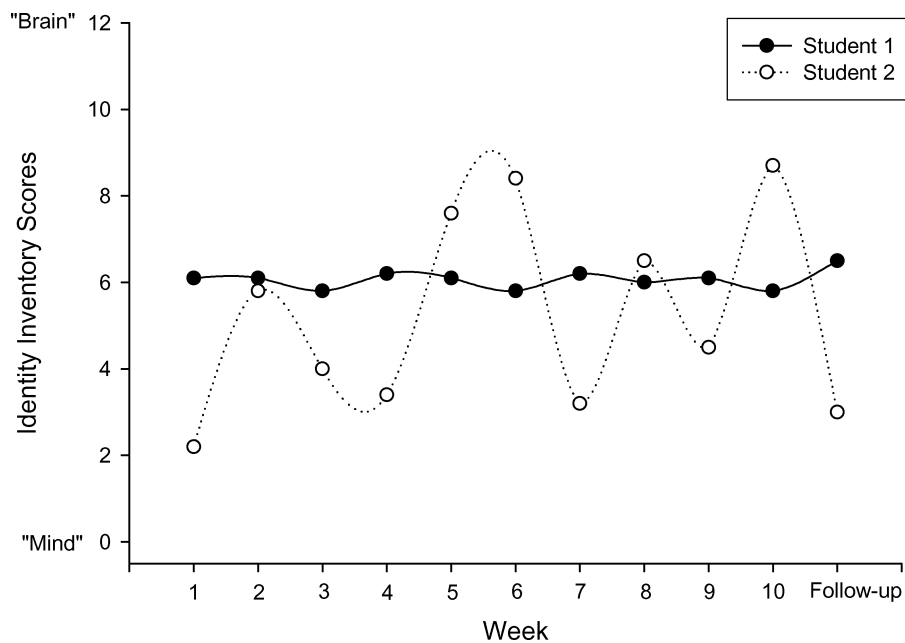


Figure 1. Examples of two students' variability on the Identity Inventory.

grade in this seminar course was based primarily on their ability to present articulate and sound arguments in written and oral form and not on the content of those arguments.

This study demonstrates that bringing epistemological perspectives to the forefront in the undergraduate psychology classroom was significantly related to students' improved retention for specific and general themes and application of course material in other domains. It is important to emphasize that these findings do not suggest that any one particular epistemological perspective (a distinct point on the I.I.) is preferable, or that adopting a specifically pluralistic epistemology is optimal; instead, they support the transparent identification of the epistemological context for a particular lesson and the acknowledgment of alternate perspectives (i.e., Loving, 1997).

Although the developmental stage of college students lends itself to a course examining different epistemological perspectives on the topic of identity (e.g., Erikson, 1959), explicitly defining epistemological biases or encouraging epistemological exploration can be profitably applied in many settings within (and outside) the field of psychology. Our findings were limited because they were based on a small sample of first-year students in two sections of a seminar course and by our inability to control for other factors that might have influenced knowledge retention and application. However, we believe our findings are applicable to other courses. Research methods courses, a core component

of most undergraduate psychology curricula, would be an excellent venue for explicit discussion of the epistemology and specific critiques of the scientific method (e.g., Laudan, 1981; Loving, 1997). Likewise, courses on psychopathology or human sexuality, common to many psychology departments, might illuminate scientific and nonscientific perspectives on mental illnesses or facets of gender and sexuality (e.g., Adler, 2008).

These findings can inform the practice of teaching psychology in several ways. First, the incorporation of team teaching methods greatly facilitates the goal of encouraging epistemological exploration among students. The benefits of team teaching have been well documented in the field of psychology (e.g., Flanagan & Ralston, 1983; Hammer & Giordano, 2001; Wilson & Hobbs, 2006), yet the unique ability of this pedagogical format to enhance epistemological exploration and content retention has not been specifically elaborated. We recommend that teachers join with instructors from complementary areas of psychology or other departments to construct and lead courses on key topics. Emphasizing epistemological differences in the formulation of questions, research methods, and the criteria by which knowledge is judged has the potential to promote deeper student engagement with the material.

Second, our findings suggest that teachers adopt a transparent position with respect to the epistemological basis of their own teaching and acknowledge

competing perspectives. In practice, teachers could introduce a particular course on any topic with a presentation or discussion of the criteria by which he or she will be evaluating the merits of given arguments.

Third, the I.I. instrument can easily be used to gauge students' shifting epistemological perspectives, to measure teaching effectiveness, or to monitor the development of student thought. In this course, we used the I.I. at discrete time points to provide a diverse perspective in assigning students to teams for group projects.

In summary, our results suggest that encouraging students to explore multiple epistemological positions facilitates retention and application of course material. By adopting a transparent epistemological perspective in the classroom and acknowledging alternative theories of knowledge, instructors encourage students to deeply engage with the presented material, which could facilitate better learning outcomes.

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Notes

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