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How Do Students' Beliefs about Learning Relate to the Teaching Methods and Classroom Activities They Perceive as Effective?

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Abstract

The purpose of this study was to determine how college students' beliefs about learning and knowledge related to the types of teaching methods and classroom activities they perceive as effective in helping them to learn. Comparisons were also made based on year in college. Beliefs about learning were assessed using the Epistemic Belief Inventory (EBI; Schraw, Bendixen, & Dunkle, 2002), which yields scores on 5 dimensions: Omniscient Authority, Certain Knowledge, Quick Learning, Simple Knowledge, and Innate Ability. A number of significant correlations were found. For example, scores on the Quick Learning dimension were negatively correlated with effectiveness ratings for lecture, lab experiments, and discussions in both small and large groups (all $p < .05$). Scores on the Omniscient Authority dimension were positively correlated with effectiveness ratings for lecture ($p < .01$). Also, significant negative correlations were found between students' GPAs and their scores on the Quick Learning and Simple Knowledge dimensions ($p < .05$). First-year students scored significantly higher than other students on the Quick Learning dimension ($p < .05$) and marginally higher on the Omniscient Authority dimension ($p = .086$). In addition, first-year students gave significantly lower effectiveness ratings than other students for lecture ($p < .01$) and in-class assignments ($p < .05$).

Introduction

College students, and people in general, differ in their beliefs about learning and knowledge. Some believe that knowledge is made up of largely isolated bits of unchanging facts that can be learned fairly quickly from authorities such as professors and textbooks. Others believe that knowledge consists of networks of connected, continually evolving concepts that are learned gradually through experience, critical thinking and active construction of links among related ideas. It is likely that students with such different ideas about learning and knowledge would also differ greatly in their views regarding which teaching methods and classroom activities would enable optimal learning.

The present research was designed to test this hypothesis by determining:

- what beliefs Introductory Psychology students have about learning and knowledge
- to what degree these beliefs differ according to year in school
- whether students' beliefs are related to the types of teaching methods and classroom activities they view as effective in helping them to learn

We measured Introductory Psychology students' beliefs using the Epistemic Beliefs Inventory (EBI; Schraw, Bendixen & Dunkle, 2002). The EBI was developed using a theoretical framework proposed by Schommer (1990), in which beliefs about learning and knowledge are viewed as varying along several dimensions. The EBI itself yields scores on five dimensions of such beliefs: Omniscient Authority, Certain Knowledge, Quick Learning, Simple Knowledge, and Innate Ability.

We correlated students' scores on these dimensions with their ratings of how effective they found a variety of teaching methods and classroom activities to be in promoting their learning. For some students, we also obtained their grade-point averages (GPAs) to determine how academic performance related to beliefs about learning and the effectiveness ratings given for the various teaching methods and classroom activities.

Method

Participants and Procedure

Wave 1 – Spring 2007 and Spring 2008

- 158 Introductory Psychology students completed an online survey
- 81 women, 75 men, and 2 who did not identify their sex
- 97 first-year students, 50 sophomores, 7 juniors, and 3 seniors

Wave 2 – Fall 2008

- 186 Introductory Psychology students completed the survey
- 120 women, 65 men, and 1 who did not identify his/her sex
- 112 first-year students, 60 sophomores, 11 juniors, and 3 seniors

Materials - The survey contained the following sections:

- Academics** – self-reported GPA (Wave 1 only)
- Epistemic Belief Inventory** (Schraw, Bendixen, & Dunkle, 2002)
 - Omniscient Authority** – e.g., “When someone in authority tells me what to do, I usually do it.” and “People shouldn’t question authority.”
 - Certain Knowledge** – e.g., “What is true today will be true tomorrow.” and “If two people are arguing about something, at least one of them must be wrong.”
 - Quick Learning** – e.g., “If you don’t learn something quickly, you won’t ever learn it.” and “If you haven’t understood a chapter the first time through, going back over it won’t help.”
 - Simple Knowledge** – e.g., “Most things worth knowing are easy to understand.” and “Instructors should focus on facts instead of theories.”
 - Innate Ability** – e.g., “Smart people are born that way.” and “How well you do in school depends on how smart you are.”
- Effectiveness Ratings for Teaching Methods and Classroom Activities** **On a 5-point scale (1 = not at all effective; 5 = very effective)**
 - Lecture
 - Small-group discussions
 - Large class discussions
 - In-class demonstrations
 - Lab experiments
 - In-class writing assignments or problem sets
 - Watching students give presentations
 - Watching films/video clips

Results

Means of EBI Dimension Scores by Class Year

	Omniscient Authority	Certain Knowledge	Quick Learning	Simple Knowledge	Innate Ability
First-Years	8.97 [^]	8.16	4.99*	8.26	7.82
Sophomores	8.58	7.96	4.57	8.14	7.79
Juniors and Seniors	8.33	8.38	4.58	7.54	8.04

[^] First-Years marginally higher than the other students ($p = .086$)
* First-Years significantly higher than the other students ($p < .05$)

Results (cont.)

Mean Effectiveness Ratings of Teaching Methods by Class Year

	In-Class Demos	Small-Group Discussions	Lab Experiments	Large-Class Discussions	Watching Films/Videos	Lecture	In-Class Assignments	Student Presentations
First-Years	4.37	4.05	3.88	3.66	3.57	3.40**	3.15*	2.70
Sophomores	4.30	3.93	3.81	3.68	3.68	3.76	3.47	2.73
Juniors and Seniors	4.38	3.88	3.96	3.71	3.46	3.83	3.48	2.57
OVERALL	4.35	4.00	3.86	3.67	3.60	3.55	3.28	2.70

* First-Years significantly lower than the other students ($p < .05$)
** First-Years significantly lower than the other students ($p < .01$)

Correlations Among EBI Dimension Scores, Effectiveness Ratings for Various Teaching Methods/Classroom Activities, and GPA

	Omniscient Authority	Certain Knowledge	Quick Learning	Simple Knowledge	Innate Ability	GPA
In-Class Demos	.001	-.007	-.014	-.008	-.059	-.009
Small-Group Discussions	-.069	.004	-.115*	-.063	-.125*	-.014
Lab Experiments	-.039	-.129*	-.114*	-.137*	-.209**	-.171*
Large-Class Discussions	-.016	.030	-.115*	.002	-.004	.060
Watching Films/Videos	-.041	.049	.094	.020	.060	-.007
Lecture	.143**	.085	-.114*	.013	.081	.128
In-Class Assignments	.023	.068	-.097	.018	-.036	-.103
Student Presentations	.001	.138*	.037	.080	-.131*	-.036
GPA	-.012	-.033	-.272*	-.217*	-.017	

* $p < .05$
** $p < .01$

Discussion

First-year students scored higher than other students on the Quick Learning and Omniscient Authority dimensions of the EBI. This is important to know for teaching Introductory Psychology and other courses with a heavy enrollment of first-years, because it can pose a challenge. Students who believe in Quick Learning may tend to perceive most in-class activities as ineffective, since they believe that they can get the knowledge quickly from the textbook, a brief lecture, or online. However, these students are often the ones who struggle, as can be seen in the correlations with GPA.

Specifically, students with higher scores on the Quick Learning and Simple Knowledge dimensions of the EBI tended to have lower GPAs. Presumably, these beliefs may lead students to spend less time studying and to use study strategies that focus on rote memorization of facts rather than a deeper understanding of complex concepts, resulting in poorer performance in college. In future research, these hypotheses can be tested by including measures of studying behaviors.

Overall, students rated in-class demonstrations, small-group discussions, and lab experiments as the most effective in helping them to learn. However, these ratings varied considerably based on students' beliefs about learning, indicating that additional research on this topic would be valuable.