Persistence in the Sciences Survey: Class Outcomes Report

Collin County Community College

Bridgette Kirkpatrick: BIOL 1415 - Introduction to Biotechnology II-S01

Surveys Completed: 5; Class Participation Rate: 83.3% of total enrollment

Spring, 2020

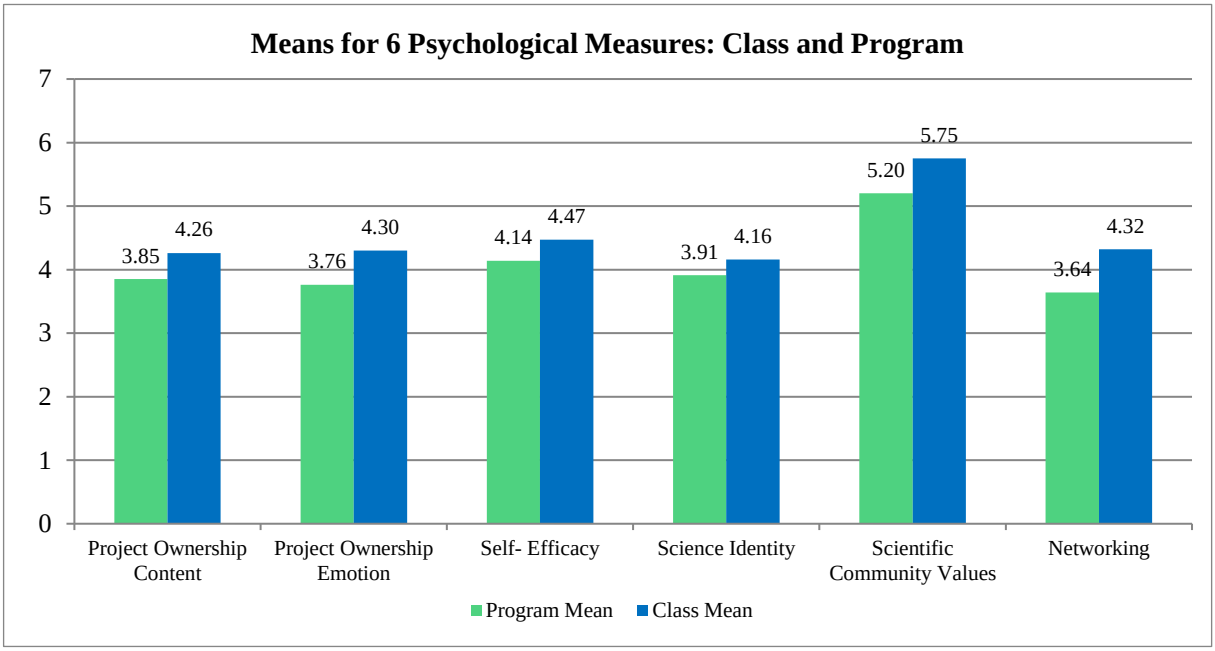


Figure 1 compares average institutional class outcomes with averaged outcomes for the whole of the SEA-PHAGES program for the 6 psychological measures on the Persistence in the Sciences (PITS) survey. Research has shown that persistence in the sciences is related to the following psychological states measured on the PITS survey:

Variable	**Construct Measured**
Project Ownership Content	Measures the degree of personal ownership and engagement a student feels in relation to the research they have conducted in a specific class
Project Ownership Emotion	Measures the degree to which a student has a positive emotive response to the research they have conducted in a specific class
Self-Efficacy	Measures the degree to which a student feels confident in functioning as a scientist.
Science Identity	Measures the degree to which a student thinks about her/himself as a scientist.
Scientific Community Values	Measures the degree to which a student has affinity to the values of the scientific community.
Networking	Measures the degree to which students are talking about their research in both professional and personal networks

For each of the PITS measures, threshold levels for groups of students who have a high likelihood of staying in the sciences or a low likelihood of staying in the sciences were established. These threshold levels were established empirically by characterizing levels of the PITS measures used by groups of students with high and low intent to stay in the sciences and then using a bootstrapping-resampling method to extrapolate population estimates. These threshold levels were used to characterize the students in your class in terms of the percentage of students who are likely, indeterminate or not likely to continue in the sciences.

Figure 2: Percentage of students in your class likely to continue or not continue in the sciences by psychological measures on the PITS survey

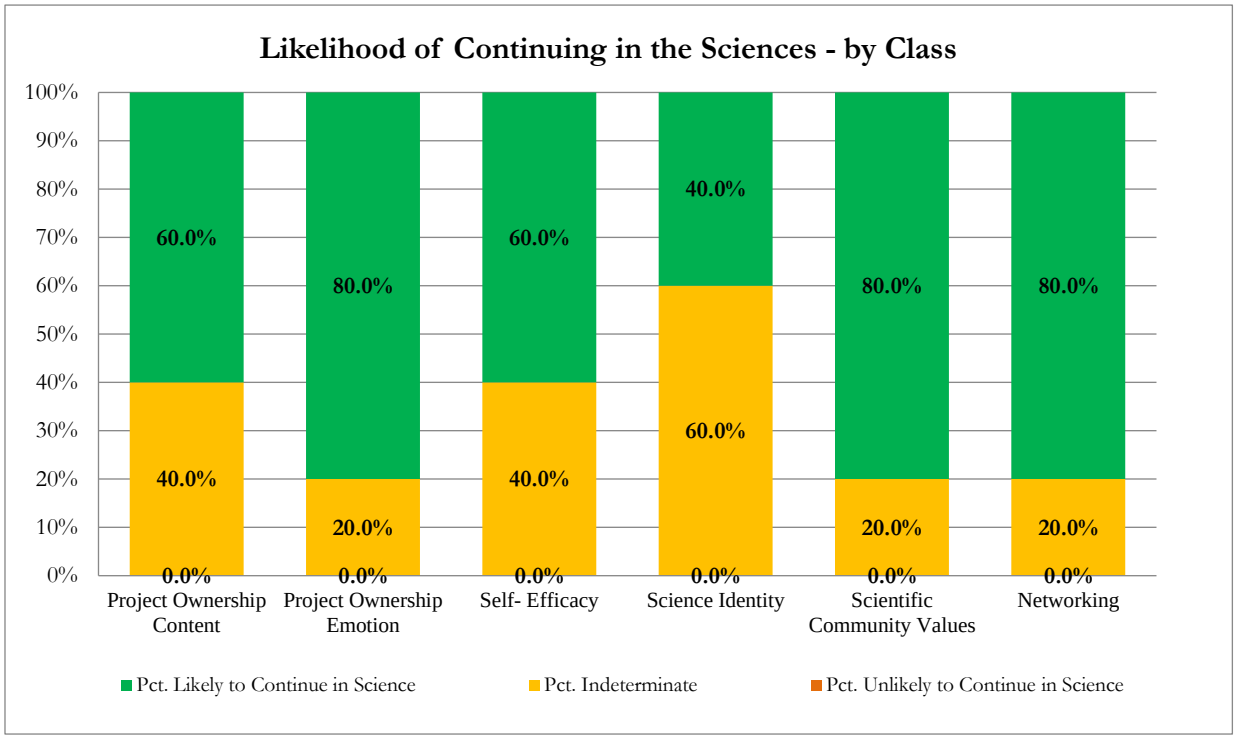
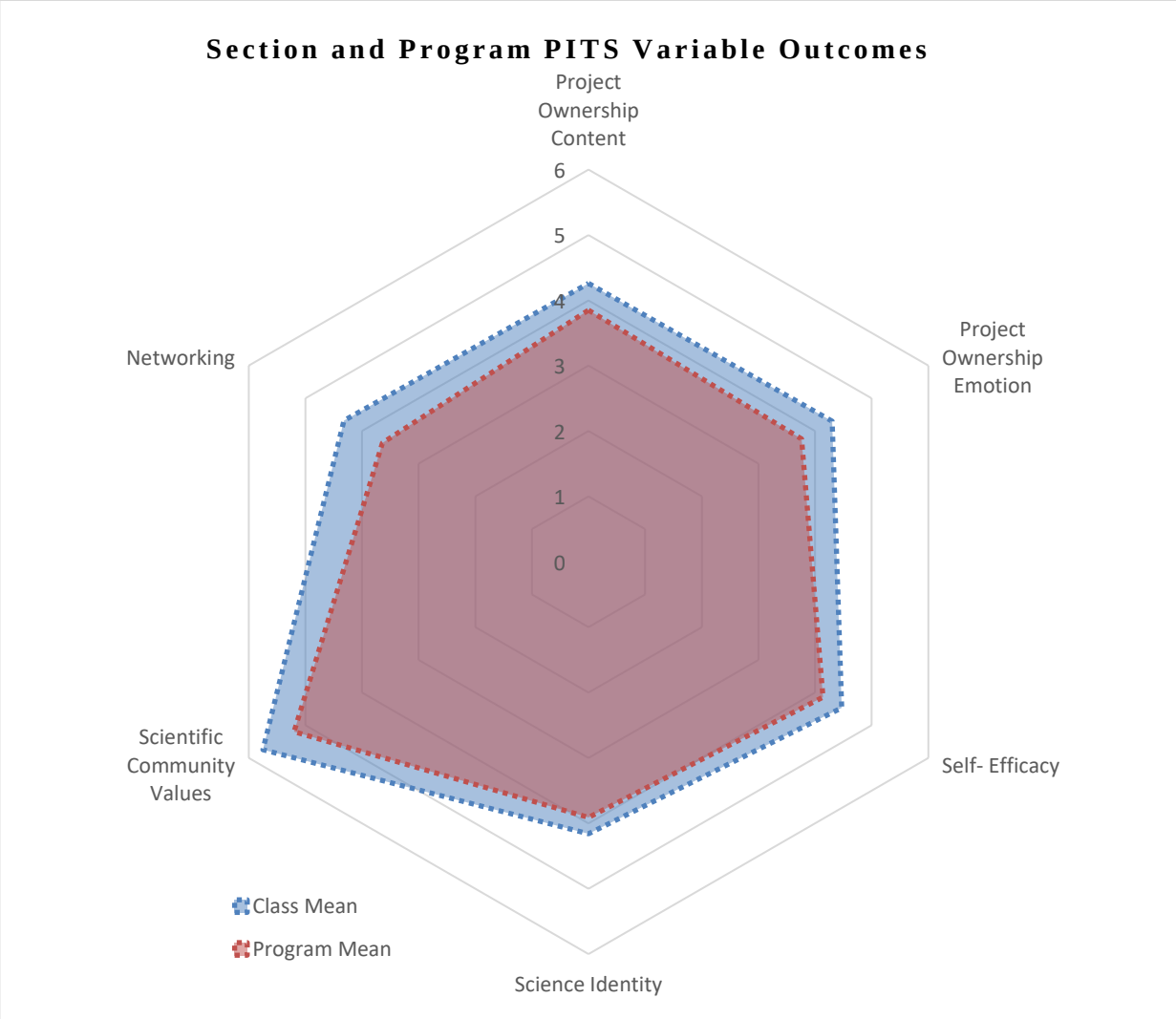


Table 1: Frequency, Mean, z-score and Percentage of Students High, Indeterminate and Low Likelihood of Continuing in the Sciences and Threshold Levels*

	Project Ownership Content	Project Ownership Emotion	Self- Efficacy	Science Identity	Scientific Community Values	Networking
High Likelihood	60% (3)	80% (4)	60% (3)	40% (2)	80% (4)	80% (4)
Indeterminate	40% (2)	20% (1)	40% (2)	60% (3)	20% (1)	20% (1)
Low Likelihood	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)	0% (0)
Class Mean, Z-score and Threshold Levels						
Z-score	0.57	0.69	0.53	0.31	0.67	0.77
Class Mean	4.26	4.3	4.47	4.16	5.75	4.32
Program Mean	3.85	3.76	4.14	3.91	5.2	3.64
High Likelihood	≥3.7	≥3.54	≥4.18	≥4.1	≥5.49	≥3.49
Low Likelihood	≤3.03	≤2.76	≤3.77	≤3.23	≤4.64	≤2.67

** Exact distance of class mean in standard deviations from the SEA-PHAGES program mean.*

Figure 3: Radar Chart comparing Class and Program Outcomes



	Project Ownership Content	Project Ownership Emotion	Self- Efficacy	Science Identity	Scientific Community Values	Networking
Class Mean	4.26	4.30	4.47	4.16	5.75	4.32
Program Mean	3.85	3.76	4.14	3.91	5.20	3.64

The PITS survey outcomes of your class (in blue) and the SEA-PHAGES program as a whole (in red) have been plotted on the radar chart (*figure 3, above)*. A radar chart is a graphical method of displaying multivariate data in the form of a two-dimensional chart. Each of the PITS survey variables have been arranged radially around a central point with a line connecting the data values for each spoke. The chart allows you to see all your results in one graph and to compare them to the overall SEA-PHAGES program. This should allow you to visualize your class outcomes and consider areas in which you are performing well and those that might need further support.