**Online Appendix**

**Survey Instrument, Pre-semester Survey**

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| When performing experiments in my chemistry laboratory course this semester, I expect to… |
|  |  |  |  |
| Item |  |  |  |
| 1 | C/A | P | learn chemistry that will be useful in my life. |
| 2 | A | N | be worried about finishing on time.  |
| 3 | C/A | P | experience moments of insight. |
| 4 | C | N | be confused about what glassware and tools would be needed to perform experiments. |
| 5 | C | P | learn critical thinking skills. |
| 6 | A | P | be excited to come to my lab section. |
| 7 | A | N | be nervous about making mistakes. |
| 8 | C | P | consider if my data makes sense. |
| 9 | C | P | think about what the molecules are doing. |
| 10 | A | N | feel overwhelmed. |
| 11 | A | P | develop confidence in my chemistry knowledge. |
| 12 | C | N | be confused about the underlying concepts. |
| 13 | C/A | P | “get stuck” but keep trying. |
| 14 | C | P | think about chemistry I already know. |
| 15 | A | N | be frustrated.  |
| 16 |  |  | *This is a test question to disregard the survey of people who are not reading the questions. Please select sixty percent for this question.* |
| 17 | C | N | focus on procedures, not concepts. |
| 18 | C | P | use my observations to understand the behavior of atoms and molecules. |
| 20 | A | N | be anxious during in-person lab periods. |
| 21 | C | P | make mistakes and tried again. |
| 22 | A | P | be intrigued by the methods and protocols. |
| 23 | A | N | feel intimidated. |
| 24 | C | N | be confused about what my data meant. |
| 25 | A | P | be confident in meeting lab objectives. |
| 26 | C | P | learn problem solving skills. |
| 27 | A | P | learn more doing labs with my classmates than if I perform labs alone. |
| 28 | A | P | learn more doing labs with a TA than if I perform labs alone. |
| Ahead of this semester, I…  |
| 29 | A | N | am nervous to work in a physical lab space. |
| *A = Affective, C = Cognitive, N = Negatively Phrased, P = Positively Phrased* |
|  |  |  |  |

**Survey Instrument, Post-semester Survey**

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| When performing experiments in my chemistry laboratory course this semester, I… |
|  |  |  |  |
| Item |  |  |  |
| 1 | C/A | P | learned chemistry that will be useful in my life. |
| 2 | A | N | worried about finishing on time.  |
| 3 | C/A | P | experienced moments of insight. |
| 4 | C | N | was confused about what glassware and tools would be needed to perform experiments. |
| 5 | C | P | learned critical thinking skills. |
| 6 | A | P | was excited to come to my lab section. |
| 7 | A | N | was nervous about making mistakes. |
| 8 | C | P | considered if my data makes sense. |
| 9 | C | P | thought about what the molecules are doing. |
| 10 | A | N | felt overwhelmed. |
| 11 | A | P | developed confidence in my chemistry knowledge. |
| 12 | C | N | was confused about the underlying concepts. |
| 13 | C/A | P | “got stuck” but kept trying. |
| 14 | C | P | thought about chemistry I already know. |
| 15 | A | N | was frustrated.  |
| 16 |  |  | *This is a test question to disregard the survey of people who are not reading the questions. Please select sixty percent for this question.* |
| 17 | C | N | focused on procedures, not concepts. |
| 18 | C | P | used my observations to understand the behavior of atoms and molecules. |
| 20 | A | N | was anxious during in-person lab periods. |
| 21 | C | P | made mistakes and tried again. |
| 22 | A | P | was intrigued by the methods and protocols. |
| 23 | A | N | felt intimidated. |
| 24 | C | N | was confused about what my data meant. |
| 25 | A | P | was confident in meeting lab objectives. |
| 26 | C | P | learned problem solving skills. |
| 27 | A | P | learned more doing labs with my classmates than if I had performed labs alone. |
| 28 | A | P | learned more doing labs with a TA than if I had performed labs alone. |
| After this semester, I…  |
| 29 | A | N | am nervous to work in a physical lab space. |

*A = Affective, C = Cognitive, N = Negatively Phrased, P = Positively Phrased*