**Evaluation of student learning in remotely controlled instrumental analyses**

The following is the script for the two online survey tools used in measuring student perception of their (1) in-person and (2) remote access laboratory experiences.

Expt 3

We are requesting your assistance in providing us with your views on the remote and/or in-lab experiments you have carried out in [these courses]. The results of the survey are being used both as a scholarly assessment of the effectiveness of these laboratory experiences and as feedback to further development and improve the experiments. We ask that you take a moment now to do the survey. It should take about ten to fifteen minutes to complete. Participation is completely voluntary, anonymous and confidential. You are free to discontinue participation at any time during the study. No one except the researchers and their supervisors will be allowed to see the answers to the questionnaires. There are no names on the questionnaires. Only group information will be summarized for any presentation or publication of results. The anonymous data will be stored on a password protected computer at XXXX for three years at which time it will be permanently erased. The results will be used to further develop this course and would benefit future students. Thank you in advance for your assistance.

# In-Person Lab Access Student Survey

Note: You should have completed both the [course] in-person experiment and the [course] remote access experiment before completing this survey.

# Anonymous Student Research Code

Reminder:This is the first three letters of your mother's name followed by the first three letters of your month of birth (no spaces). For example, mother's name is Jane and month of birth is December - anonymous research code is:JanDec

# I would recommend the in-person lab experiment to others.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# The material covered and the degree of difficulty is appropriate for the level of the course.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# The instructions were clear and easy to understand.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# Performing the in-person lab experiment has helped me understand the theory and concepts underlying the experiment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# Performing the in-person lab experiment has helped me to develop practical hands-on skills.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# When performing the experiment, I preferred the in-person lab experiment to the remote access lab experiment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# What did you like most about the in-person lab experiment?

Be specific.

# What did you like least about the in-person lab experiment?

Be specific.

# I learned more performing the experiment via in-person access rather than remote access.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# If you feel that you learned more in one mode of access to the experiment than the other, please describe here.

Be specific.

# Compared to in-person, the remote operation of the instrument was

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | More Difficult | Difficult | Similar in Difficulty | Somewhat Easier | Easy |
|  |  |  |  |  |  |

# How would you rate your level of satisfaction with the instructional materials provided in the in-person lab experiment?

Reading materials, videos, graphics, power point presentations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Did not use them | Very Dissatisfied | Dissatisfied | Neutral | Satisfied | Very Satisfied |
|  |  |  |  |  |  |  |

# Based on your experiences with the materials, are there any changes you would like to see made to the in-person lab experiment to improve its quality for other students?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Major Revisions | Minor Revisions | No changes |
|  |  |  |  |

# If you feel changes are necessary, please specify what changes you think should be made.

Expt 12

We are requesting your assistance in providing us with your views on the remote and/or in-lab experiments you have carried out in [the courses]. The results of the survey are being used both as a scholarly assessment of the effectiveness of these laboratory experiences and as feedback to further development and improve the experiments. We ask that you take a moment now to do the survey. It should take about ten to fifteen minutes to complete. Participation is completely voluntary, anonymous and confidential. You are free to discontinue participation at any time during the study. No one except the researchers and their supervisors will be allowed to see the answers to the questionnaires. There are no names on the questionnaires. Only group information will be summarized for any presentation or publication of results. The anonymous data will be stored on a password protected computer at XXXX for three years at which time it will be permanently erased. The results will be used to further develop this course and would benefit future students. Thank you in advance for your assistance.

# Remote Lab Access Student Survey

Note: You should have completed both the [course] in-person experiment and the [course] remote access experiment before completing this survey.

# Anonymous Student Research Code

Reminder:This is the first three letters of your mother's name followed by the first three letters of your month of birth (no spaces). For example, mother's name is Jane and month of birth is December - anonymous research code is:JanDec

# Where did you access the remote lab website?

|  |  |
| --- | --- |
|  | Home |
|  | Friends |
|  | NAIT |
|  | Other - please specify \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

# I would recommend the remote access lab experiment to others.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# The material covered and the degree of difficulty is appropriate for the level of the course.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# The instructions were clear and easy to understand.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# Performing the remote access lab experiment has helped me understand the theory and concepts underlying the experiment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# Performing the remote access lab experiment has helped me to develop practical hands-on skills.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# When performing the experiment, I preferred the remote access lab experiment to the in-person lab experiment.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# What did you like most about the remote access lab experiment?

Be specific.

# What did you like least about the remote access lab experiment?

Be specific.

# I learned more performing the experiment via remote access rather than in-person.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Strongly Disagree | Disagree | Neutral | Agree | Strongly Agree |
|  |  |  |  |  |  |

# If you feel that you learned more in one mode of access to the experiment than the other, please describe here.

Be specific.

# Compared to in-person, the remote operation of the instrument was

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | More Difficult | Difficult | Similar in Difficulty | Somewhat Easier | Easy |
|  |  |  |  |  |  |

# How would you rate your level of satisfaction with the instructional materials provided in the in-person lab experiment?

Reading materials, videos, graphics, power point presentations

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Did not use them | Very Dissatisfied | Dissatisfied | Neutral | Satisfied | Very Satisfied |
|  |  |  |  |  |  |  |

# Based on your experiences with the materials, are there any changes you would like to see made to the in-person lab experiment to improve its quality for other students?

|  |  |  |  |
| --- | --- | --- | --- |
|  | Major Revisions | Minor REvisions | No changes |
|  |  |  |  |

# If you feel changes are necessary, please specify what changes you think should be made.