**Arduino Interest, Self-Efficacy, and Knowledge After Instruction**

**Informed Consent**

We are conducting this study to determine the effectiveness of an Arduino lesson and activity on students’ self-efficacy, interest, and knowledge of Arduino programming. There is no foreseeable risk as a result of participating in study. Your participation in this study is completely voluntary and declining to participate or discontinuing participation in this study at any time will not result in any penalty or loss of benefits to which you are otherwise entitled.

**If you consent to participate in this survey:**

1. Remove this page and keep it for your records.

**2. Print your first and last name in the blanks at the top of the next page.**

**3. Complete the attached Interest and Self-Efficacy Survey.**

Also, complete the required (graded) Arduino Knowledge Posttest

If you have any questions concerning this study, please feel free to contact either of the individuals listed below:

[Deleted]

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This survey contains four sections. In the first section, we want to know how you feel about learning Arduino now that you have completed the lesson and hands-on in-class activity.

In the second section, we want to know how confident you are that you can complete specific tasks related to writing Arduino sketches (programs) after having completing the lesson and hands-on in-class activity.

In the third section, we want to know how confident you are that you can complete specific tasks related to breadboarding circuits from the Arduino UNO after having completing the lesson and hands-on activity.

In the final section, we would like to know a little about you and your previous experiences related to Arduino, Arduino programming and similar activities.

Please respond honestly - there are no wrong or right answers.

**Please print your first and last name in the blank below and then begin with Part I of the survey.**

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(first and last).

**Part I: Attitude Toward Learning About Arduino**

Please read each of these statements and rate your level of agreement with each statement by circling the appropriate number to the right of the statement, where 1 = “Strongly Disagree,” 2 = “Disagree,” 3 = “Neither Agree nor Disagree,” 4 = “Agree,” and 5 = “Strongly Agree.”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Statement** | **Strongly**  **Disagree** | **Disagree** | **Neither Agree nor Disagree** | **Agree** | **Strongly**  **Agree** |
| I liked learning about Arduino. | 1 | 2 | 3 | 4 | 5 |
| Arduino fascinated me. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino will be of great value to me. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino held my interest. | 1 | 2 | 3 | 4 | 5 |
| Arduino was the most annoying topic in this course. | 1 | 2 | 3 | 4 | 5 |
| I would like to learn more about Arduino. | 1 | 2 | 3 | 4 | 5 |
| I think Arduino was boring. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino gave me skills I will use in life. | 1 | 2 | 3 | 4 | 5 |
| I am glad that I had the chance to learn about Arduino. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino was beneficial to me. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino helped me to develop good reasoning ability. | 1 | 2 | 3 | 4 | 5 |
| I was interested in learning about Arduino. | 1 | 2 | 3 | 4 | 5 |
| Learning about Arduino was difficult. | 1 | 2 | 3 | 4 | 5 |

(Please continue to Part II on the next page)

**Part II: Level of Confidence in Writing Arduino Sketches (Programs)**

Please read each statement and rate your current level of confidence for that statement by circling the most appropriate number, where 1 = “Very Unconfident,” 2 = “Only Slightly Confident,” 3 = “Somewhat Confident,” 4 = “Moderately Confident,” and 5 = “Very Confident.”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **How confident are you of your ability to?** | Very  Unconfident | Only  Slightly Confident | Somewhat  Confident | Moderately  Confident | Very  Confident |
| Write Arduino sketch statements that use correct syntax (format). | 1 | 2 | 3 | 4 | 5 |
| Place Arduino statements in the correct section of the sketch (e.g. in the void setup *or* void loop *section*)*.* | 1 | 2 | 3 | 4 | 5 |
| Explain the basic logical structure of an Arduino sketch. | 1 | 2 | 3 | 4 | 5 |
| Write a short Arduino sketch to do a task that is familiar to you. | 1 | 2 | 3 | 4 | 5 |
| Write a short Arduino sketch to do a task that is not familiar to you. | 1 | 2 | 3 | 4 | 5 |
| Write a short Arduino sketch that someone else can understand and use. | 1 | 2 | 3 | 4 | 5 |
| De-bug (find errors and correct) a short Arduino sketch that you wrote, and make it work. | 1 | 2 | 3 | 4 | 5 |
| Mentally trace through a short Arduino sketch written by someone else and explain what will happen when the sketch runs. | 1 | 2 | 3 | 4 | 5 |
| Find ways of overcoming the problem if you get stuck while writing a  short Arduino sketch. | 1 | 2 | 3 | 4 | 5 |
| Quickly come up with a suitable strategy for writing an Arduino sketch to do a specific task. | 1 | 2 | 3 | 4 | 5 |
| Manage your time efficiently if you had a deadline for writing an Arduino sketch. | 1 | 2 | 3 | 4 | 5 |
| Find a way to concentrate on your Arduino sketch even, even when there are many distractions around you. | 1 | 2 | 3 | 4 | 5 |
| Find ways of motivating yourself to complete an Arduino sketch, even if the project is of no interest to you. | 1 | 2 | 3 | 4 | 5 |

(Please continue to Part III on the next page)

**Part III: Level of Confidence in Building Arduino Circuits on a Breadboard.**

Please indicate how confident you currently are that you can perform each of the following tasks by circling the most appropriate number, where 1 = “Very Unconfident,” 2 = “Only Slightly Confident,” 3 = “Somewhat Confident,” 4 = “Moderately Confident,” and 5 = “Very Confident.”

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Not at All Confident | Only Slightly Confident | Somewhat Confident | Moderately Confident | Very Confident |
| Connect a specific analog pin from the Arduino UNO to a breadboard. | 1 | 2 | 3 | 4 | 5 |
| Connect a specific digital pin form the Arduino UNO to a breadboard. | 1 | 2 | 3 | 4 | 5 |
| Connect a ground (GND) pin form the Arduino UNO to a breadboard. | 1 | 2 | 3 | 4 | 5 |
| Connect components (e.g. LEDS and resistors) and wires to the breadboard to build a complete electronic circuit. | 1 | 2 | 3 | 4 | 5 |
| Trace the flow of current through a circuit built on a breadboard. | 1 | 2 | 3 | 4 | 5 |
| Forward-bias a light-emitting diode (LED). | 1 | 2 | 3 | 4 | 5 |
| Calculate the proper size (ohms) resistor to use to protect an LED from excess current. | 1 | 2 | 3 | 4 | 5 |
| Follow a simple electronic circuit schematic to build the circuit on a breadboard. | 1 | 2 | 3 | 4 | 5 |

(Please continue to Part IV on the next page)

**Part IV. Background Information**

**Directions:** Please respond to the following questions in the manner indicated.

1. What is your current academic classification? (circle your response)

A. Freshman

B. Sophomore

C. Junior

D. Senior

E. Graduate Student

2. What is your gender? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ (fill in the blank)

3. Before studying Arduino programming in this class, did you have any experience doing any type of computer programming? (circle your response)

NO

YES

*If YES, please describe your previous experience(s):*

4. Did you have any hands-on experience with Arduino before we studied it in ASTM 1613? (circle your response)

NO

YES

Thank you!