Developing a Broad Measure of Undergraduate Students’ Sustainability and Renewable Energy Knowledge and Perspectives

Hang Song¹, Karen McNeal¹, Lauren Beckingham², John Solomon³, Kelly Lazar⁴

Introduction

- It is vital to study undergraduate student’s attitudes about renewable energy application
- Students need to be aware of sustainable engineering as an optional career pathway
- Quantitative survey was designed to determine to participate student renewable energy knowledge and perceptions
- The survey has five different sections to study five areas of the undergraduate students’ attitudes and fundamental knowledge

Surveys

- Five sections
  - S1: Multiple choice questions about the basic knowledge on global warming/renewable energy application (6 questions)
  - S2: Students attribute about 12 statements on renewable energy (12 questions)
  - S3: Test the possibility that the students would like to change their behaviors to save energy (9 questions)
  - S4: Test how much the renewable energy could influence students’ future job hunting (6 questions)
  - S5: Students were asked to grade the agreement about the list of abilities in the workplace. (19 questions)
- Survey Background
  - Two schools: Auburn University & Tuskegee University
  - Period: 9/2021-5/2022
  - Pre-test: at the beginning of each semester, students were asked to join the pre-test.
  - Post-test: before the end of each semester, students (some groups) were asked to join the SAME test again. (2-month gap)
- Survey result analysis:
  - In total: 224 results (128 Pre and 96 Post) 84 attended both pre & post
  - Auburn: 128; Tuskegee: 96
  - Male: 161; Female: 61; Others: 2
  - Freshman: 38, Sophomore: 67, Junior: 58, Senior: 55, Others: 5

Table 1: Paired Samples Statistics

<table>
<thead>
<tr>
<th>Pair</th>
<th>Statistic</th>
<th>Mean</th>
<th>St Deviation</th>
<th>St Err Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>Par 1</td>
<td>Pre vs Post</td>
<td>-0.2008</td>
<td>0.2222</td>
<td>0.056</td>
</tr>
<tr>
<td>Par 2</td>
<td>Pre vs Post</td>
<td>-0.1932</td>
<td>0.094</td>
<td>0.04</td>
</tr>
<tr>
<td>Par 3</td>
<td>Pre vs Post</td>
<td>-0.1954</td>
<td>0.1122</td>
<td>0.05</td>
</tr>
<tr>
<td>Par 4</td>
<td>Pre vs Post</td>
<td>-0.1942</td>
<td>0.094</td>
<td>0.04</td>
</tr>
<tr>
<td>Par 5</td>
<td>Pre vs Post</td>
<td>-0.1931</td>
<td>0.093</td>
<td>0.04</td>
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</tbody>
</table>

Table 2: Paired Samples Test

<table>
<thead>
<tr>
<th>Pair</th>
<th>Paired Differences</th>
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<th>Std. Error Mean</th>
<th>Interval of the Difference</th>
<th>t</th>
<th>df</th>
<th>Sig. (2-tailed)</th>
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</thead>
<tbody>
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<tr>
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<tr>
<td>Par 5</td>
<td>Pre vs Post</td>
<td>-0.1931</td>
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<td>0.084</td>
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</tbody>
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Fig. 7: Overall Conclusion of the 1-year data

Conclusion

- Data in the new semester is collecting
- Add a new question: we ask the participants to rank the top 9 abilities they considered most helpful in their future career
- Similar questions will also ask the stakeholders; we will compare the difference between the undergraduate student and stakeholders

Future work

Acknowledgement

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