



Cornell University

Renewable Energy Education:

*Does it impact Students' perception of climate change?
Does environmental education alter students' attitudes
towards environment?*

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Preliminary Research Findings:

1. Students when measured on their subjective norms on learning about renewable energy place greater emphasis on **their teachers** than they do on their **parents or friends**.
2. Students' extrinsic motivations (**test and curriculum**) are strongly correlated in affecting their behavioral intent to learn renewable energy.
3. Students' intrinsic motivation (**personal preference**) is also extremely high to learn or continue to learn about renewable energy.



(1) Self-sufficiency in Energy needs



(2) Environmental implications in meeting the energy needs



Three Fixes:

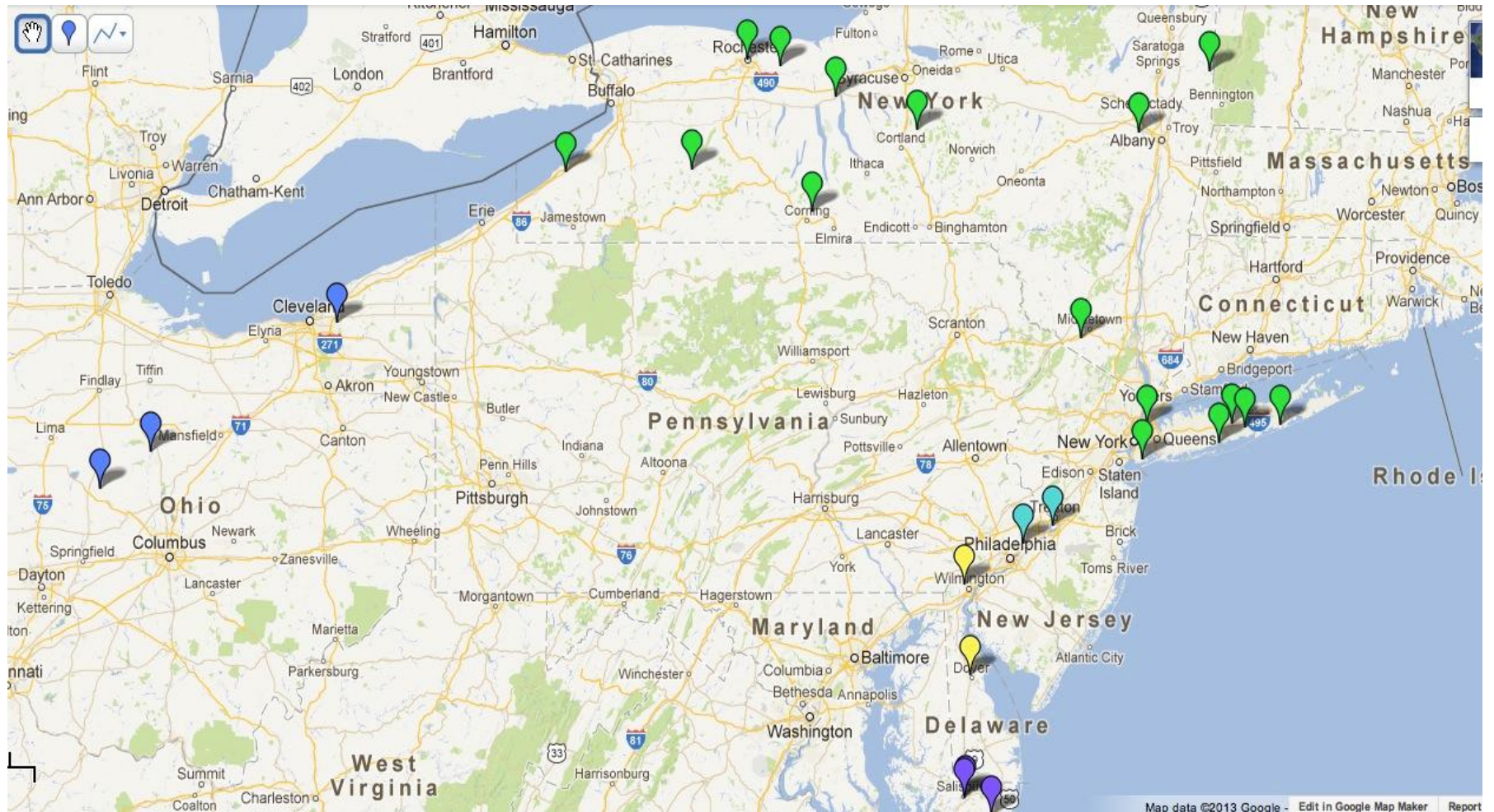
Heberlein (2012) proposes three fixes to our environmental problems

1. Structural fix (changing human behavior contextually)
2. Technological fix (retrofitting buildings or changing the environment directly-carbon sequestration)
3. **Cognitive fix** (presenting information or educating people and then relying on them to change).



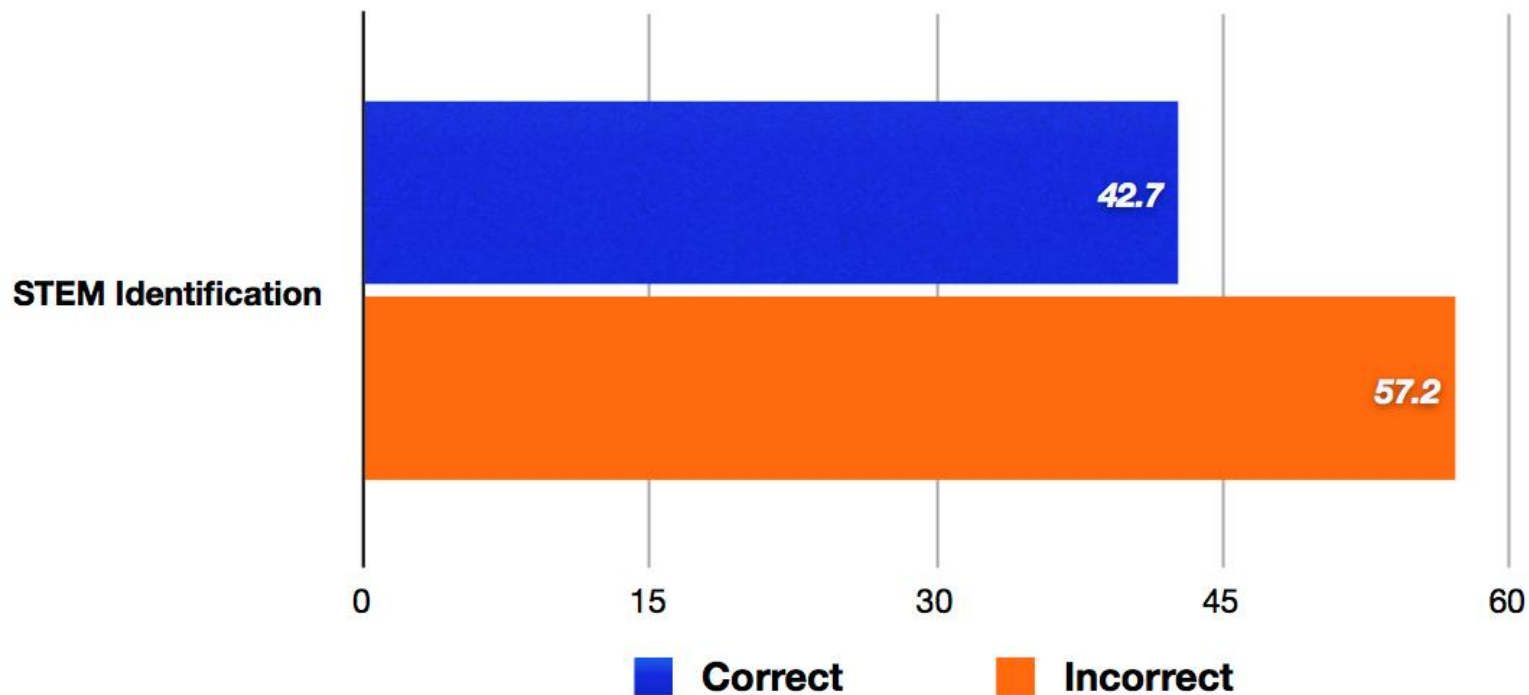
Research Study Sites

Fig 1: Location of participating schools during 2012-13



STEM Findings

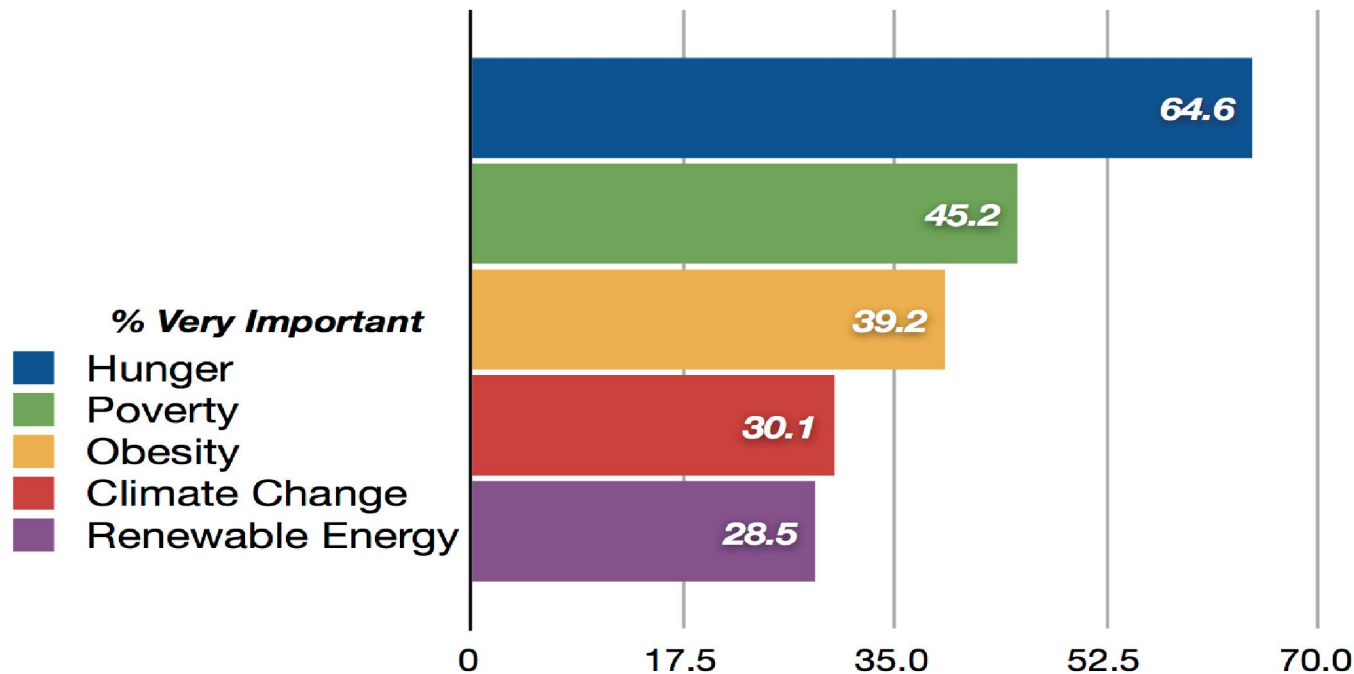
Fig 2: Total Identification (%) Of STEM Acronym Across Five States (n=1587)



Surprisingly, we found that a considerable majority (~58%) of students' grade 8-12 have an incorrect understanding of what STEM stands for.

Relative Importance of Societal Problems

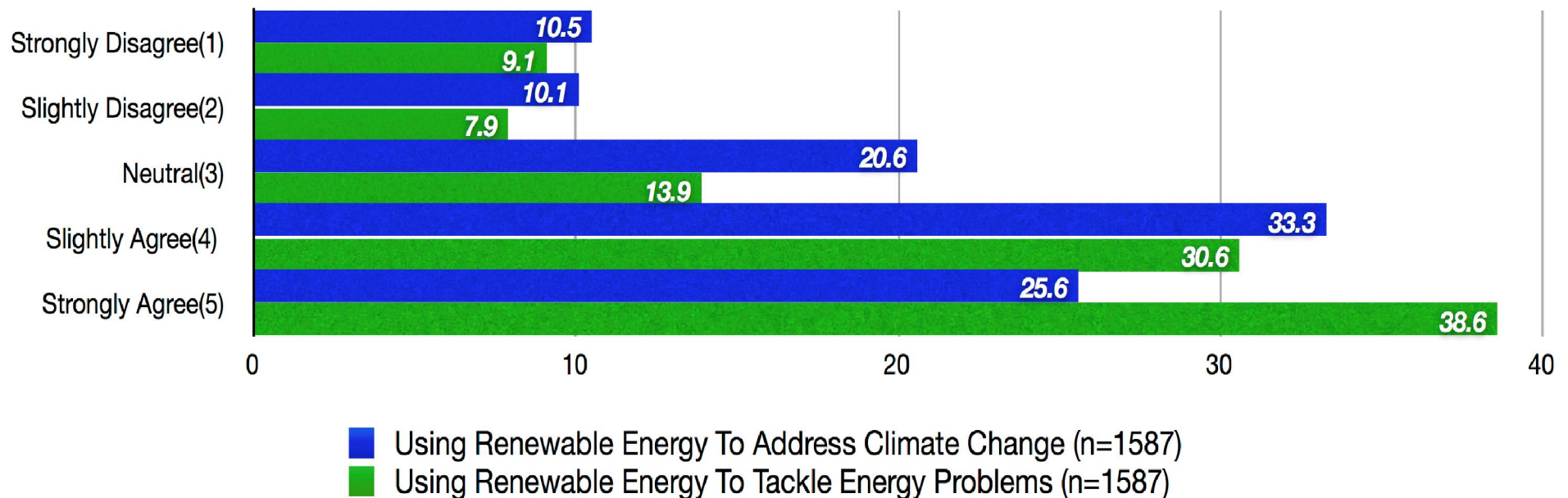
Fig 3: Importance Of Climate Change Relative To Other Societal Issues (n=1587)



We find that the relative importance of renewable energy to be lowest (28.5%) when compared with other societal issues such as hunger (64.6%).

Climate change vs. Energy Security

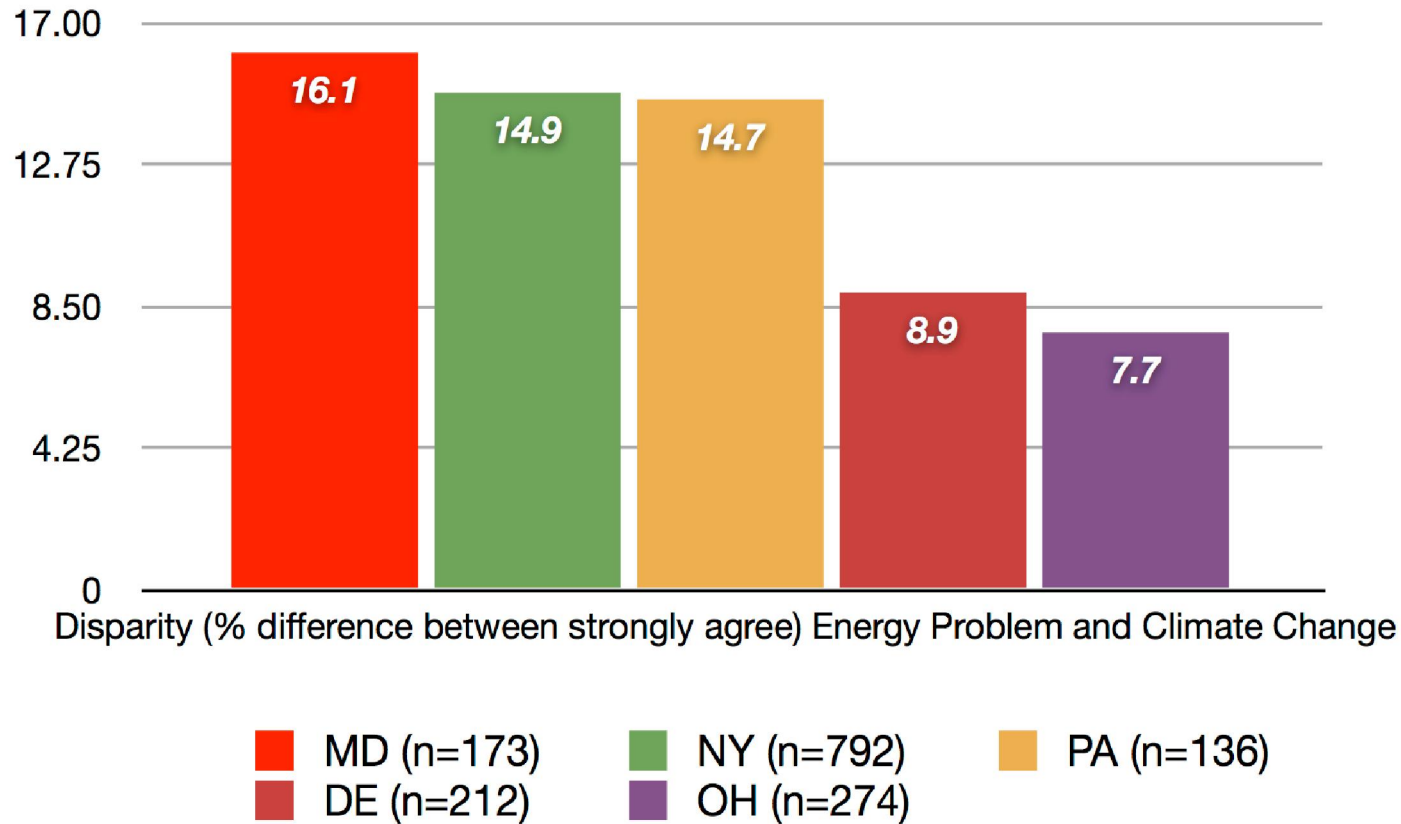
Fig 4: Renewable Energy As An Option To Address Climate Change vs. Energy Problems (%)



The comparative evaluation (fig 4) of using renewable energy (*RE*) as a means to address climate change vs. using *RE* to solve energy problem indicates a relative lower agreement (25.6%) in using *RE* to address climate change.

Dissonance In RE as a Solution

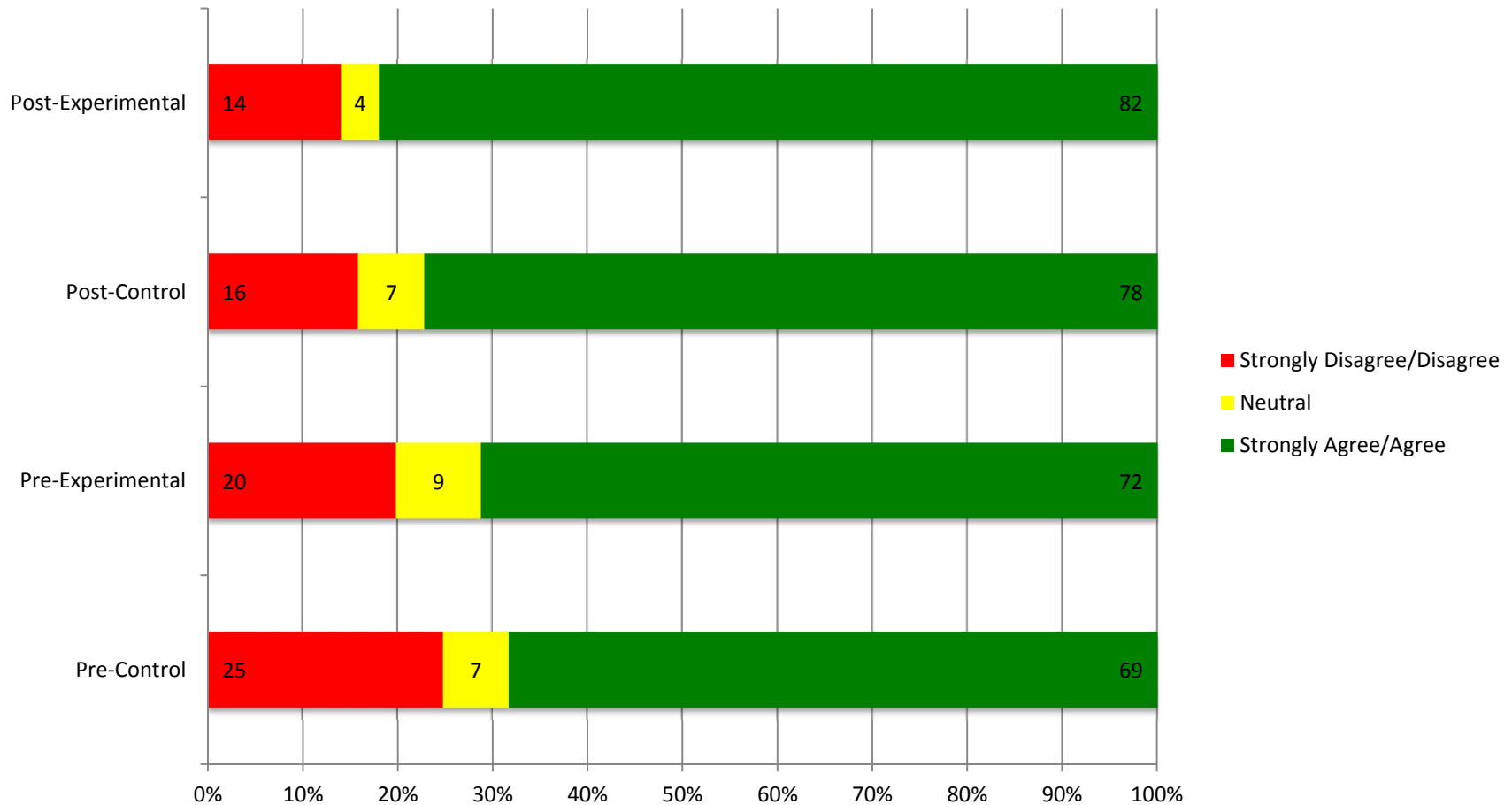
Fig 5: Disparity Across Five States In Using Renewable Energy As An Option



We find this disparity existing across regions (fig 5) with Ohio and Delaware having the least divergence (7.7% and 8.9% respectively).

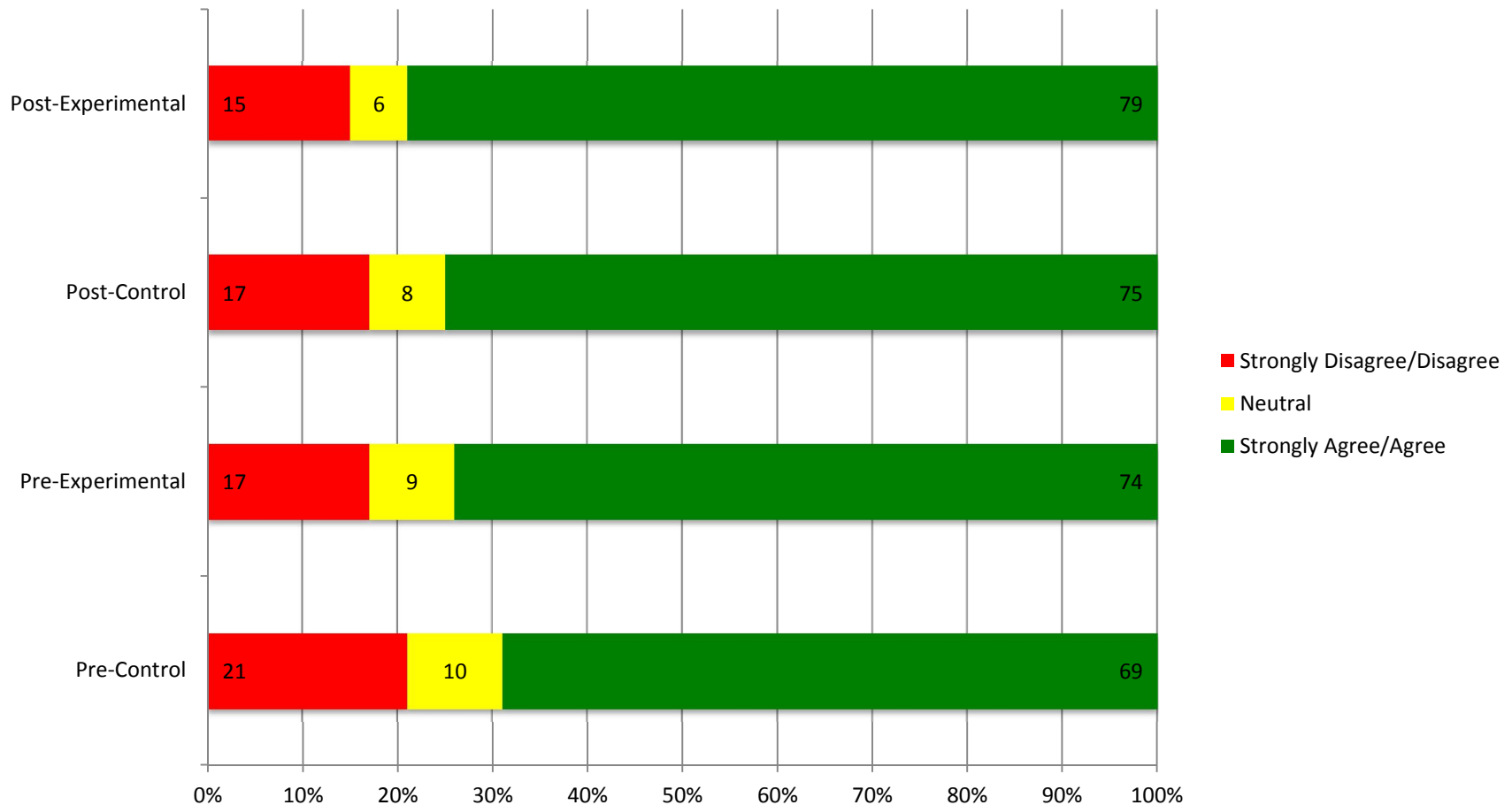
Preliminary Results

Fig 6: Students' willingness (%) to learn about renewable energy if the topic was included on tests (pre-survey: n=1549; post-survey: n=1439).



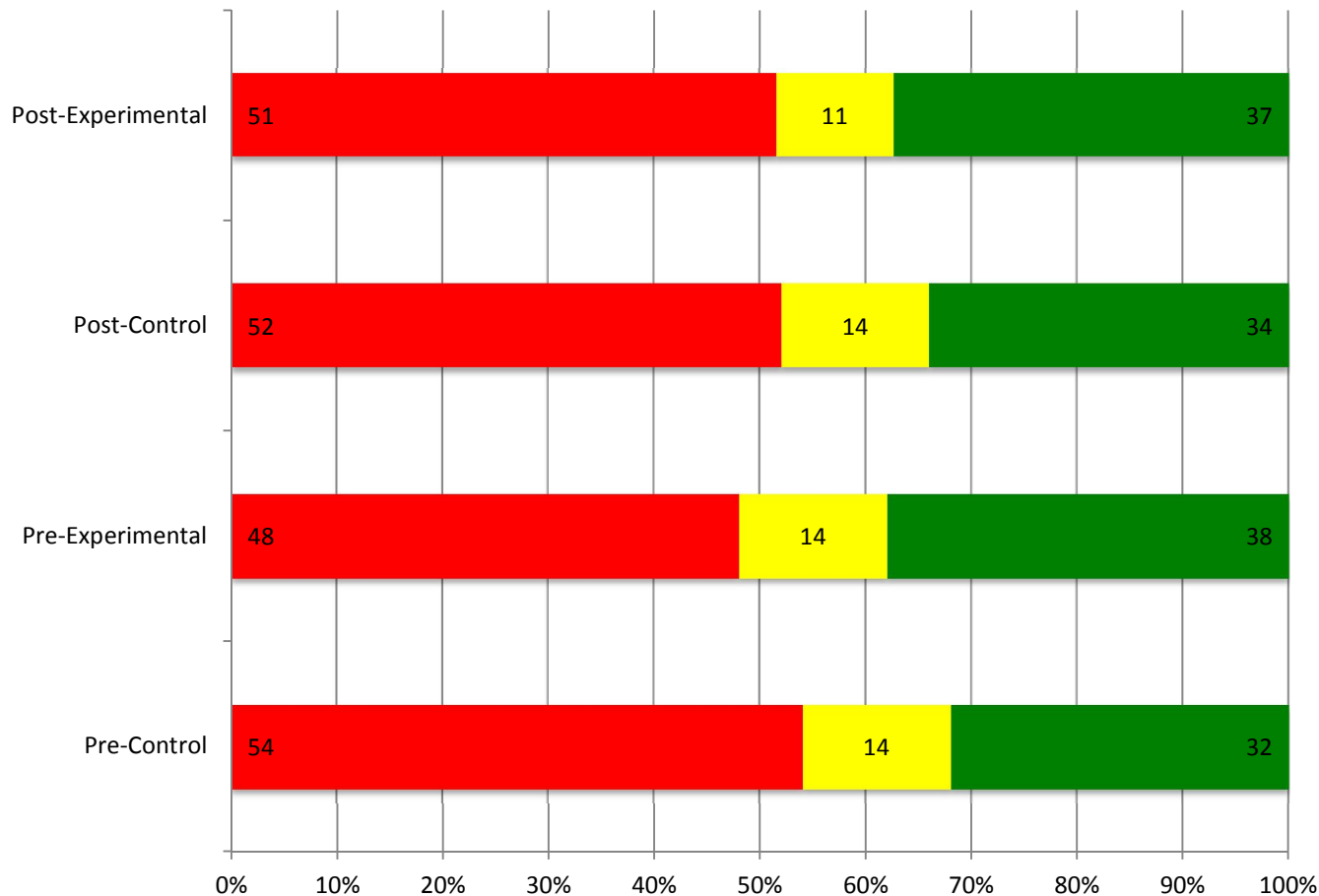
Preliminary Results

Fig 7 : Response of students (%) to learn about renewable energy if asked by their teachers (pre-survey: n=1549;post-survey: n=1439).



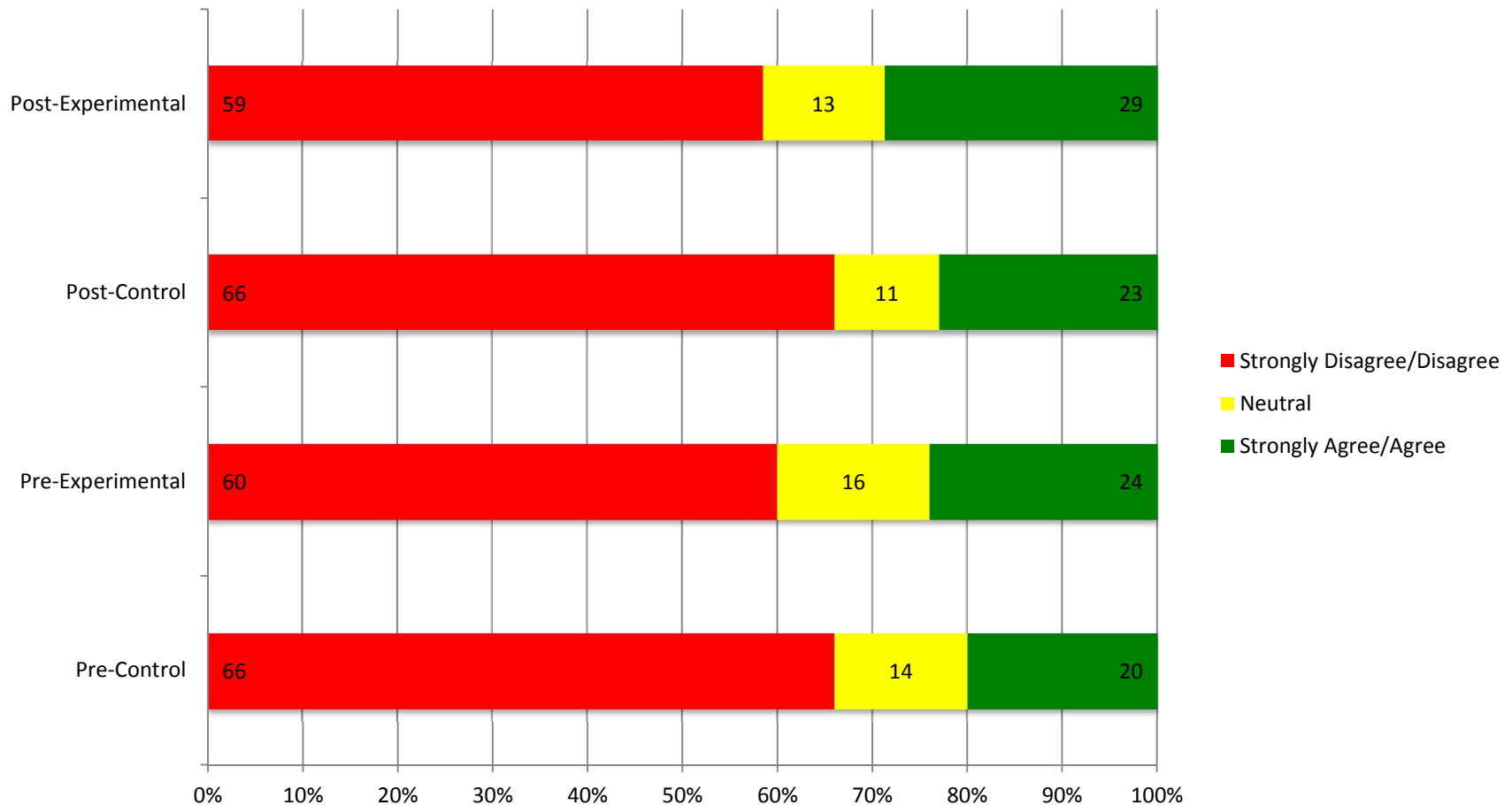
Preliminary Results

Fig 8 : Response of students (%) to learn about renewable energy if asked by their parents (pre-survey: n=1549;post-survey: n=1439).



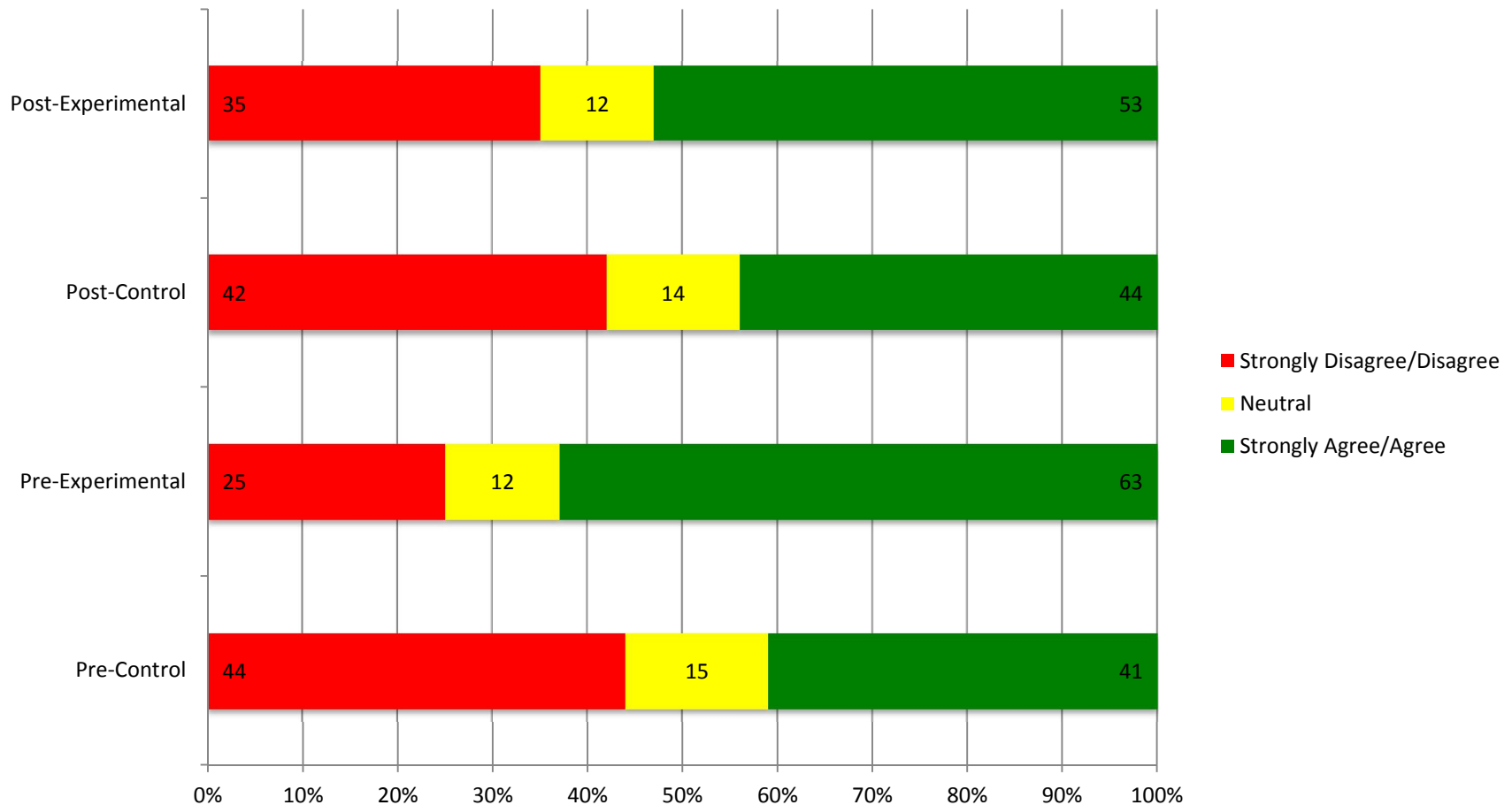
Preliminary Results

Fig 9: Response of students (%) to learn about renewable energy if their friends wanted to (pre-survey: n=1549;post-survey: n=1439).



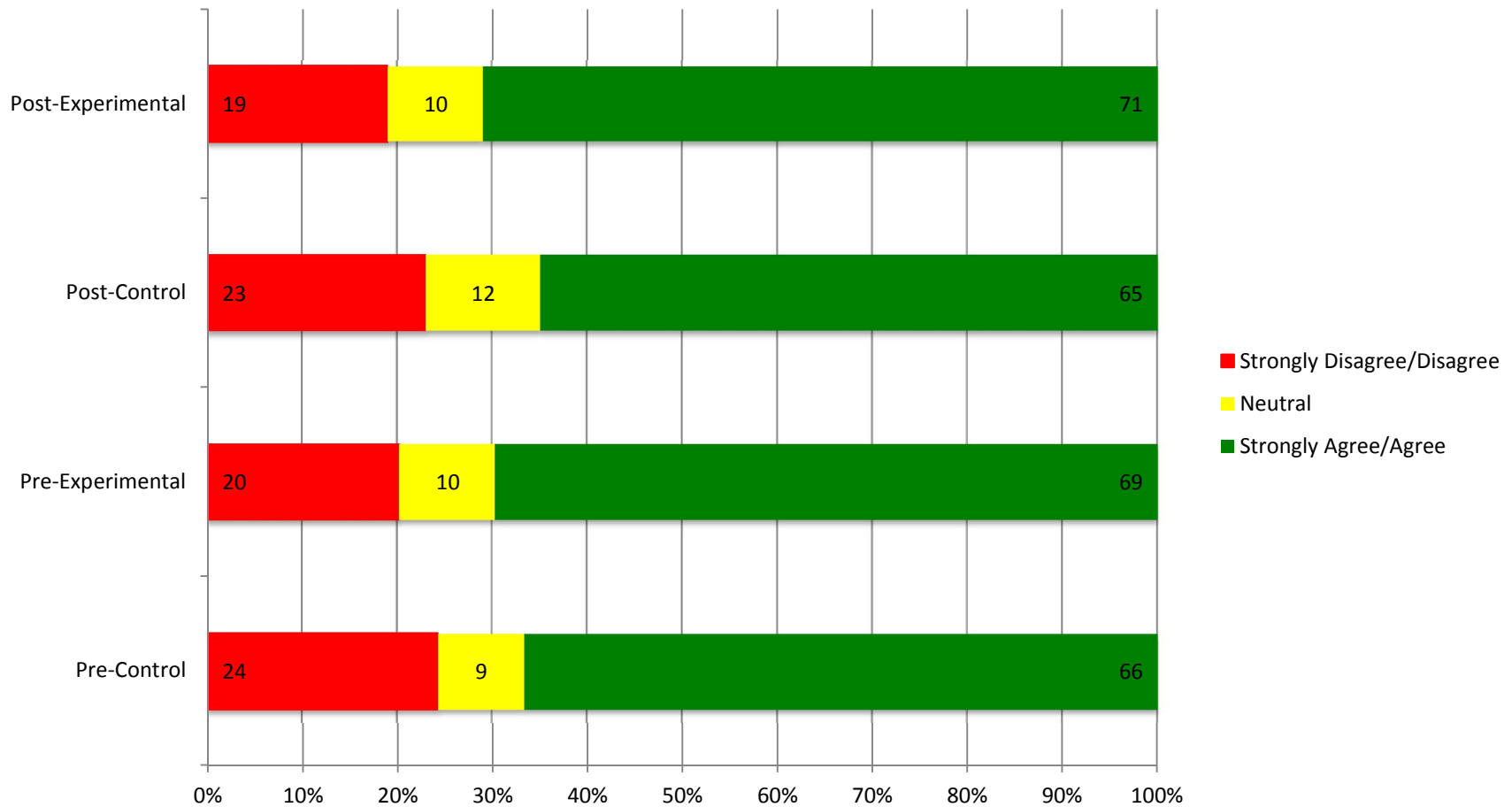
Preliminary Results

Fig 10: Students (%) expectations on learning about renewable energy in the future (pre-survey: n=1549;post-survey: n=1439).



Preliminary Results

Fig 11: Students (%) personal preference on learning about renewable energy in the future (pre-survey: n=1549;post-survey: n=1439).



Conclusions....

1. The students across sites place direct emphasis on systemic educational drivers
 - Tests
 - Teachers
2. Societal norms (hunger, obesity vs. renewable energy) and subjective norms (parents and friends) have little traction on students' learning.



Conclusions....

3. A directed policy on enhancing student education could generate increased renewable energy literacy (REL) within students only through an interdisciplinary curricula adoption of renewable energy topics.



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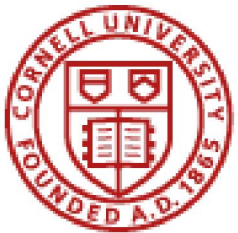
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Questions and/or Comments

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