

Recycling Lithium Ion Batteries: Impediments and Opportunities on Campus

The Great Problem Seminar: Recover, Reuse & Recycle

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Sponsor: Center for Resource Recovery and Recycling – Dr. Eric Gratz



WPI

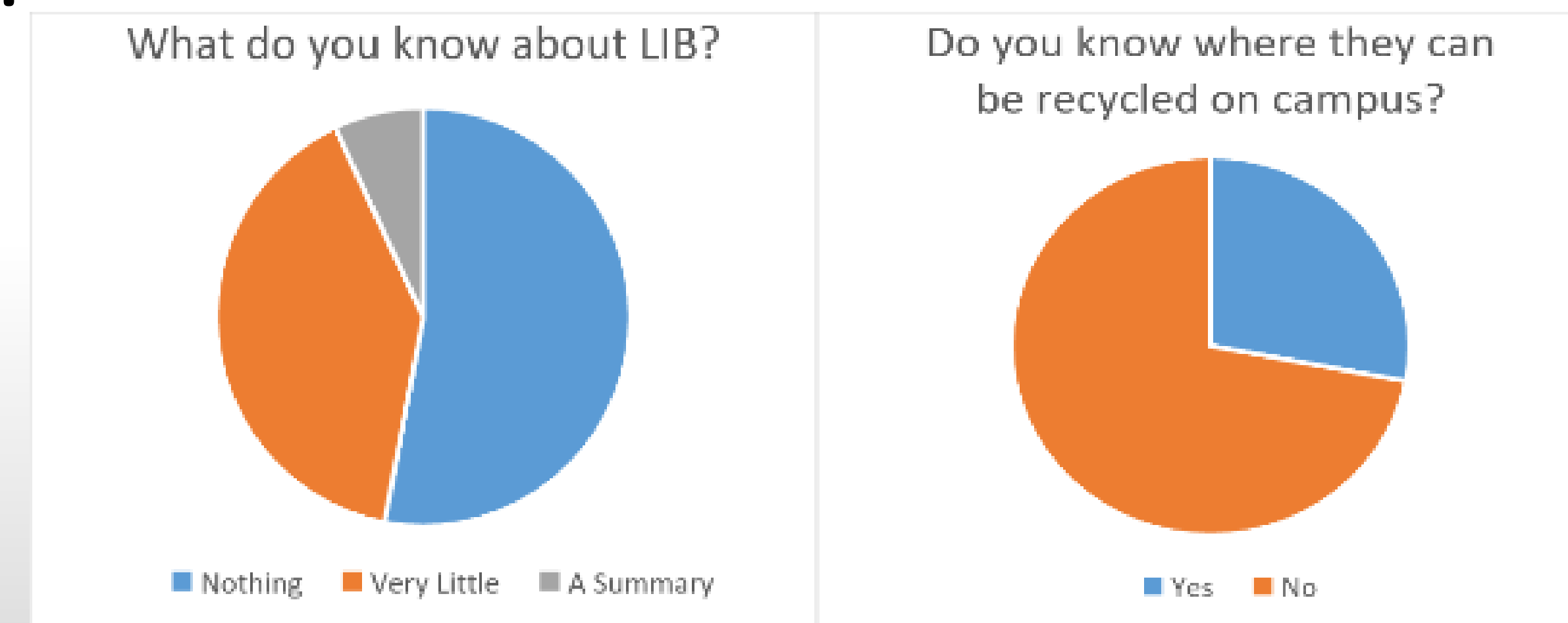
Abstract

Lithium-ion batteries (LIBs) are rechargeable and are in most portable appliances and electric vehicles. Although rechargeable, after about 1,000 charging cycles LIBs are unusable. Currently only 10% are recycled in the U.S. Our group raised awareness of this on WPI's campus, influencing thousands of people to recycle their LIBs.^{1,2}

Methodology

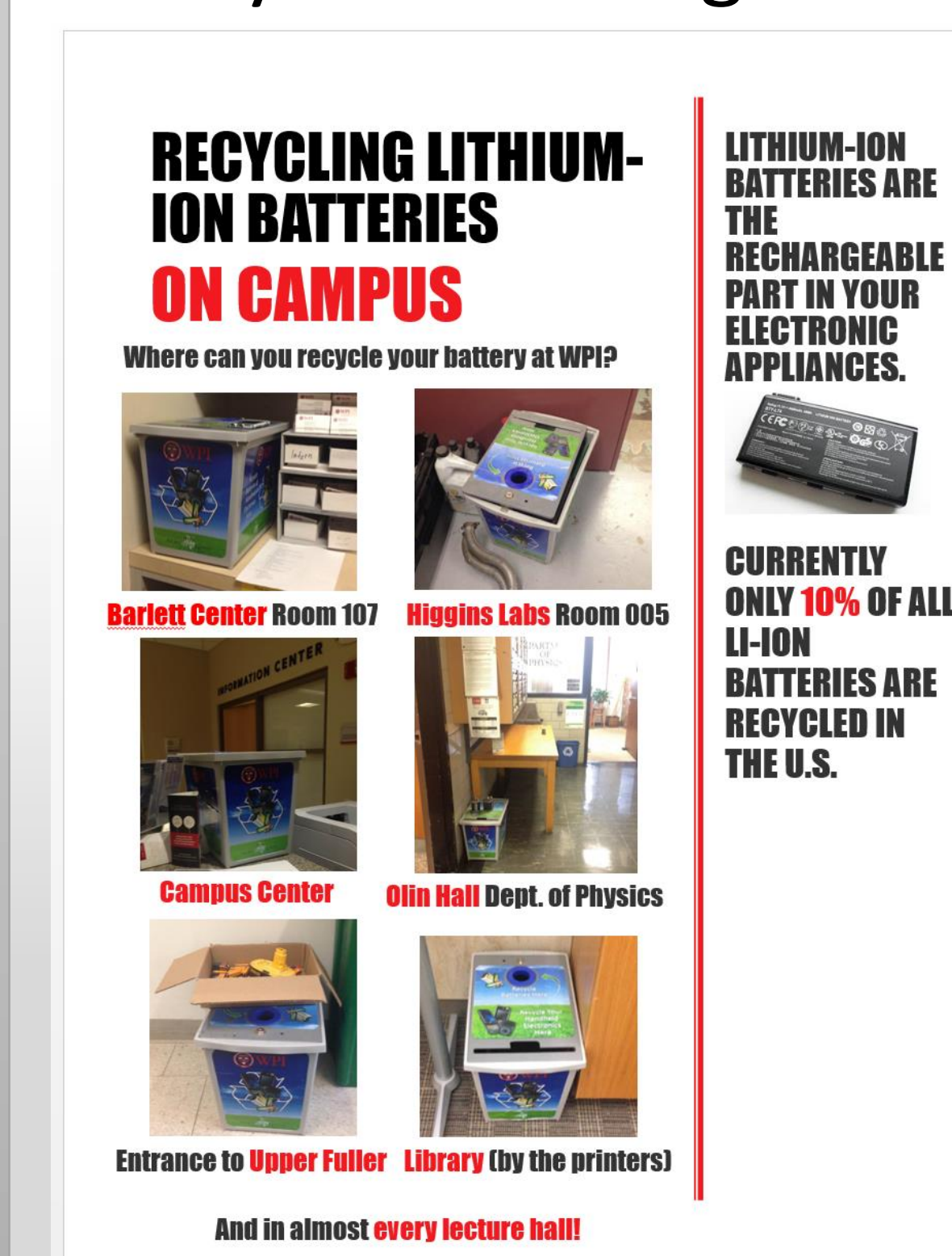
1. A short survey was distributed amongst 300 random WPI students

Results:



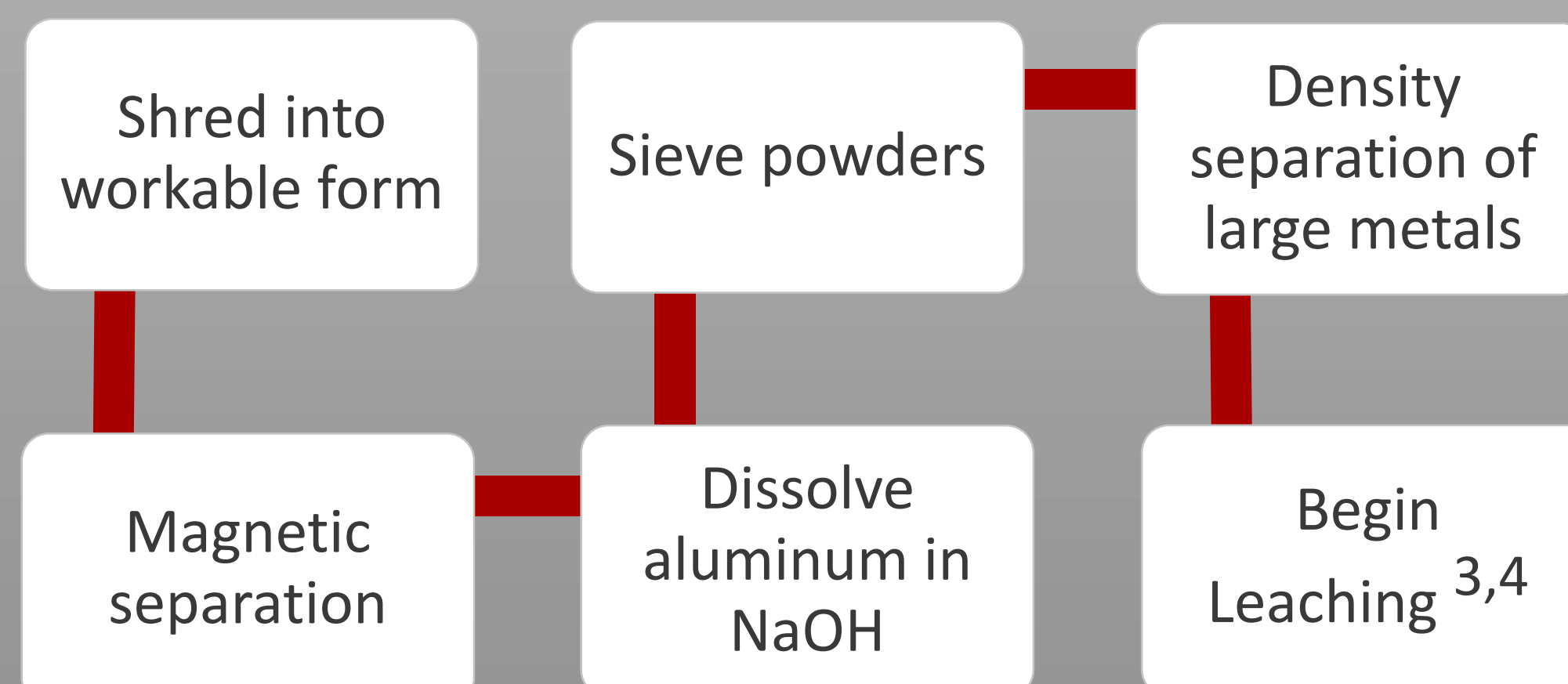
- Over half of WPI's student body did not know what LIBs were
- Almost three quarters did not know where LIBs could be recycled on campus

2. A flyer was designed to improve awareness and recycling rates



- Placed in commonly visited areas
- Made recycling bins' presence known
- Also displayed on WPI social media pages and dining hall televisions
- Information put into chalk messages on walkways

Steps to Recycle

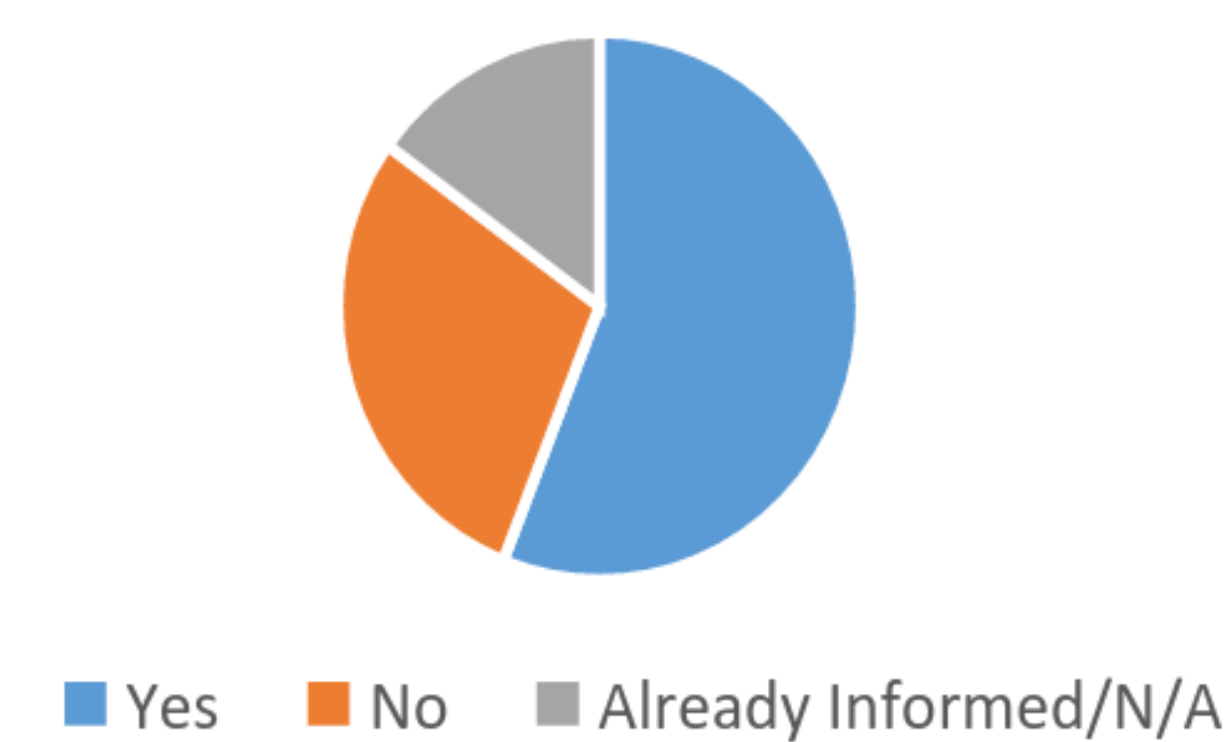


Results and Future Proposals

• A follow-up survey was redistributed to another 300 random students after two weeks of utilizing methods

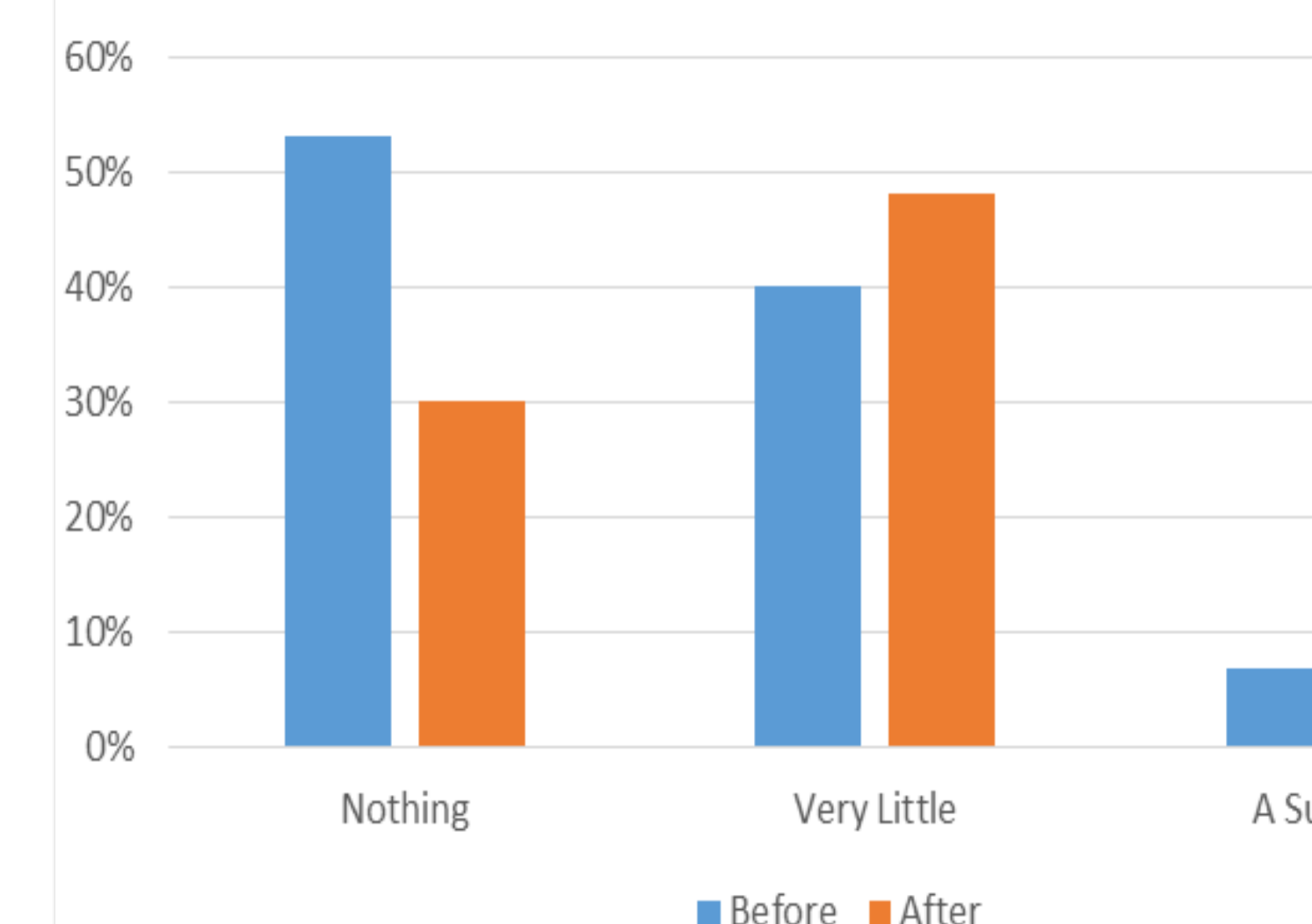
Results: (Assuming 5,000 student population)

Did these ads educate you and/or influence you to recycle LIBs?



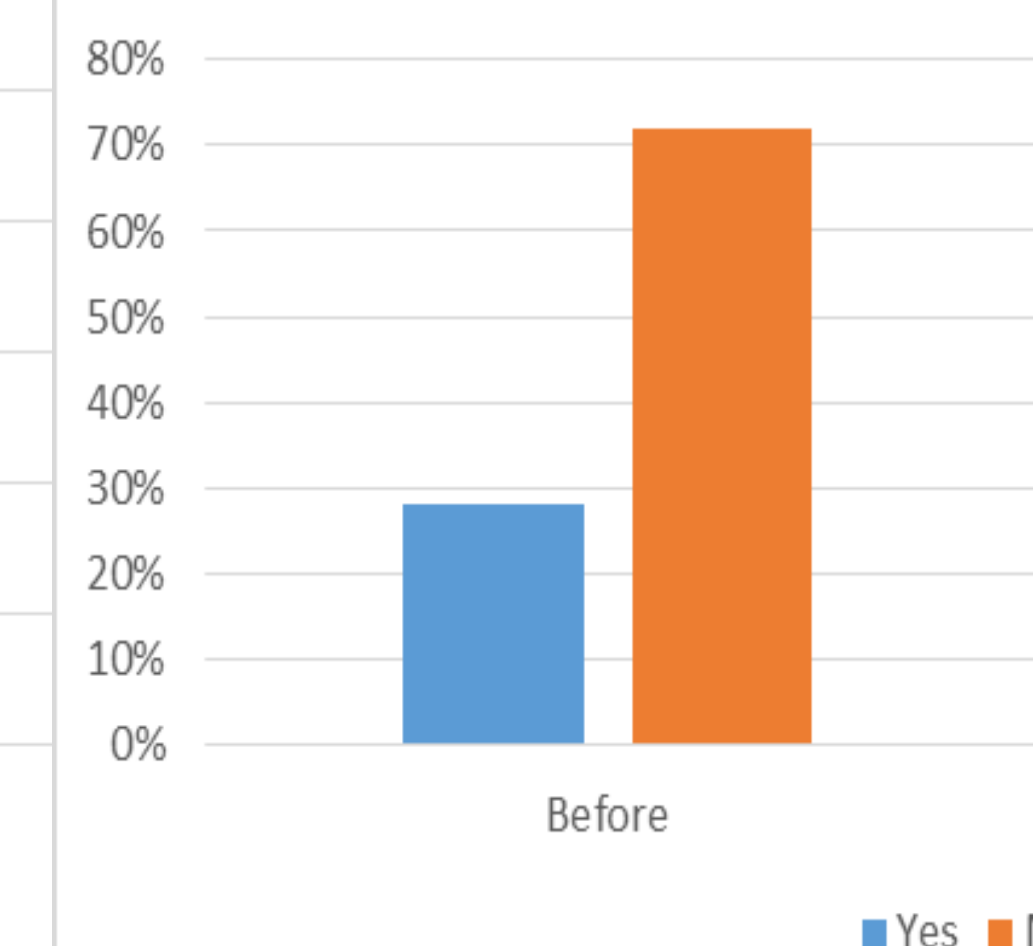
- Over 2,500 students influenced by our ads

What do you know about LIBs?



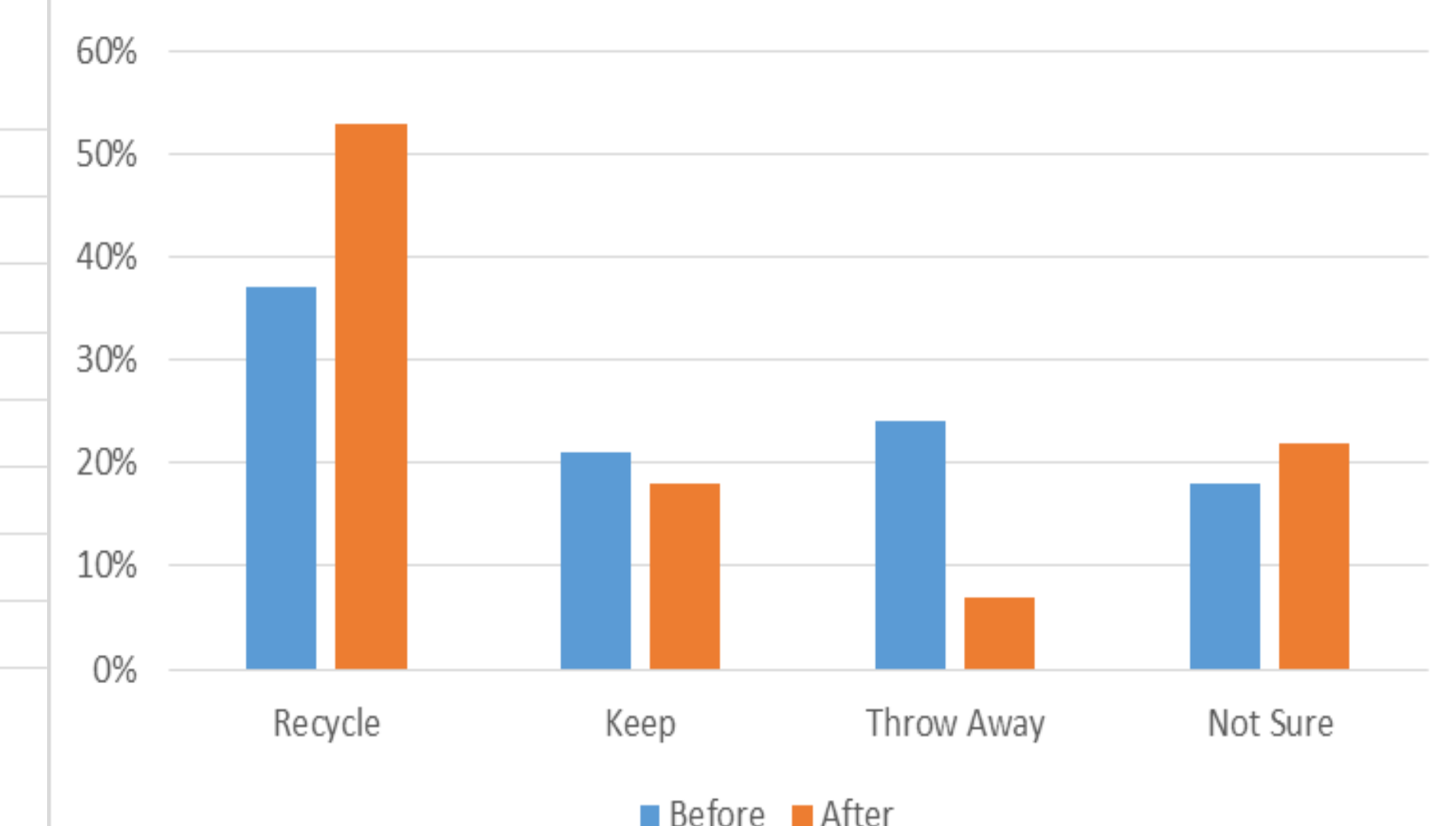
- 20% decrease in students who knew nothing about LIBs

Do you know where LIBs can be recycled on campus?



- 1,800 people now know where to recycle their LIBs at WPI

What do you plan to do with your next LIB?



- 1,000 less people plan to put their next LIB into a landfill

• For our project to have long-lasting effects, Associate Director of Sustainability, Liz Tomaszewski and Dean of Undergraduate Students, Kristin Wobbe have agreed to incorporate recycling LIBs on campus into New Student Orientation at WPI.⁶

Background



- Invented in the 1980s
- Used in portable electronic devices and electric vehicles
- Rechargeable properties
- Reduced size and weight compared to previous options
- Commercialization in 1991^{5,6, 2,4}

Bibliography:

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