The Discover Sensors Project:

An investigation into student attitudes through an inquiry based science teaching and learning framework.

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DSE / SFI

National Centre of Excellence -MSTL

- Research Centre for Science and Mathematics Education.
- Conduct evidence based research in teaching and learning
  - Based in the University of Limerick.
  - Established in 2008.
- www.nce-mstl.ie

NCE-MSTL were recruited to the project in February 2011 in an advisory and analytical capacity.

Discover Science & Engineering

- National awareness programme to promote Science, Engineering, Technology & Maths (STEM)
- Managed by Science Foundation Ireland
- Funded by the Department of Enterprise Jobs & Innovation

Discover Sensors – Project Overview

- Promotes inquiry based science teaching and learning
- Blended approach (CPD supported by on-line resources – ICT in the classroom)
- Aimed at Junior Certificate level
- Increasing the interest in, and understanding of, science and technology and encouraging students to consider science as a viable career option
- Managing change……

……. And change is SLOW

- Change is slow – 4 year Programme of CPD
- Support of management & colleagues is ESSENTIAL
- Assessment is the tail that wags the dog!

Framework

- Inquiry based science teaching and learning framework
- Developed by teachers for teachers
- Work in progress
- Can be applied to other subjects

Resources

- www.discoversensors.ie
- Learning Activities
- Stimulus to Engage
- Formative Assessment booklets
- Interactive Materials
- Data-sets
- Teacher Area/Forum
- Video Tutorials
- Sensors Box
- Mentor team

Irish Education System

- Junior Certificate (JC) Programme.
  - three year programme at the beginning of post-primary education
    - Students are usually aged 12-15 year old.
    - Formal examination at the end of three year programme.

Sample Group

- Recruited 40 science teachers 9 Secondary Schools under the Kildare Vocational Education Committee (VEC)
- Approx 800 students.

  – VEC- education body that administers some secondary education and adult education in Ireland.

Data Collection

Evaluation and Analysis: NCE-MSTL

- Data:
  1. Assessment Booklets
  2. Students Reflections: Pre, Mid and Post
  3. Teacher Interviews
  4. CPD Observations
  5. Teacher questionnaires

Focus of Presentation- Reflections

- A pre, a mid and a post reflection was administered to the students.
- Best method to gather information without imposing too much on class time.
- Insight into the students thinking and investigate if there was a change in their attitudes.

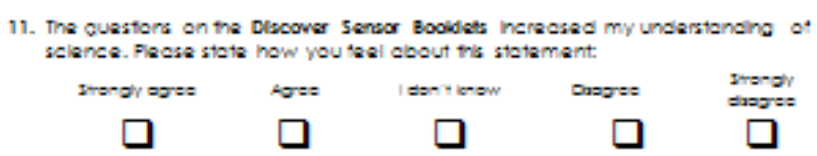
Reflection One:

Short
Designed to obtain an insight in to student learning and attitudes.

711 reflections returned from 8 out of the 9 schools.

(596 - 1st yr, 155 - 2nd yr)

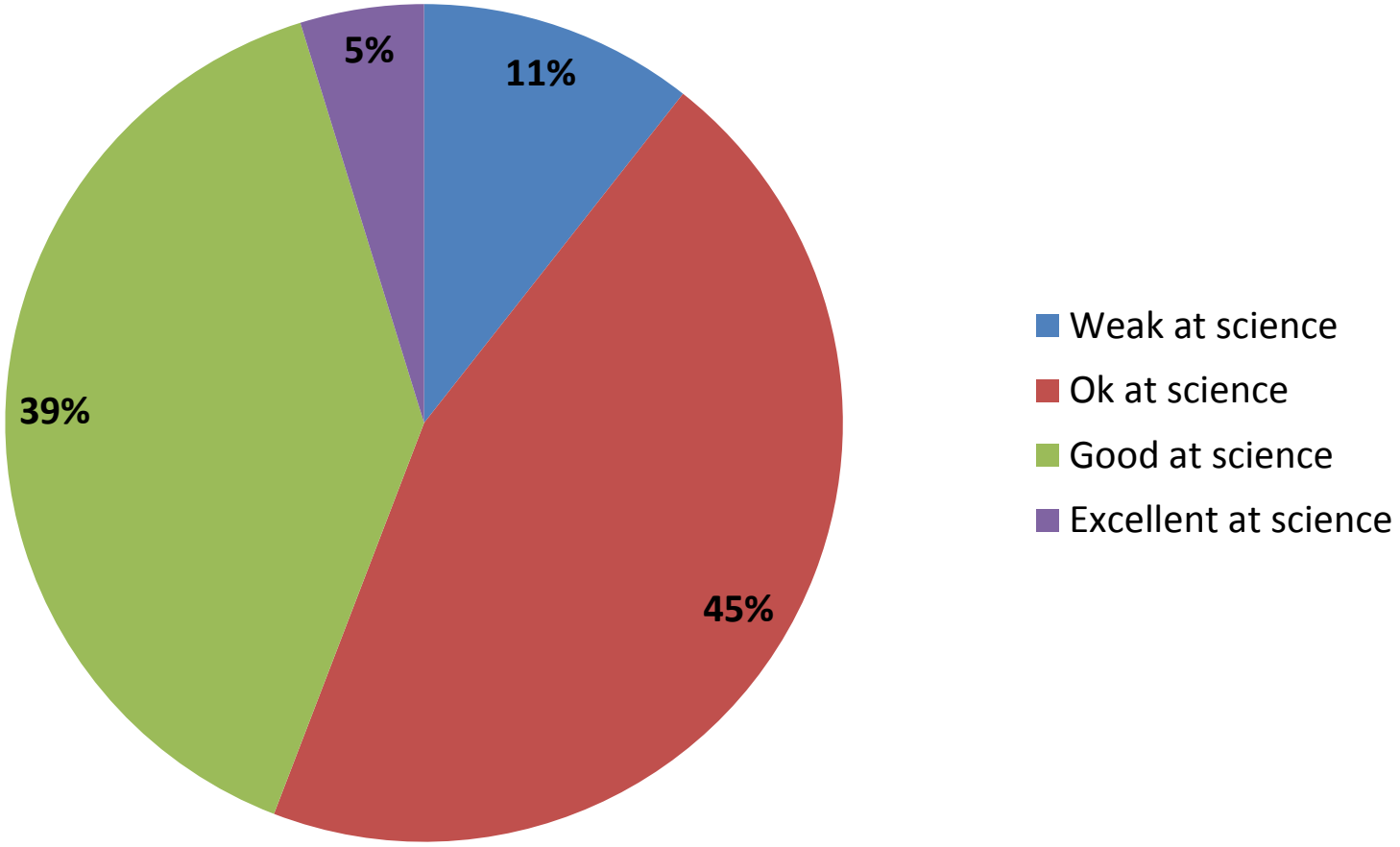
Administered in Sept/Oct 2011.


11. The questions on the **Discover Sensor Booklets** increased my understanding of science. Please state how you feel about this statement:

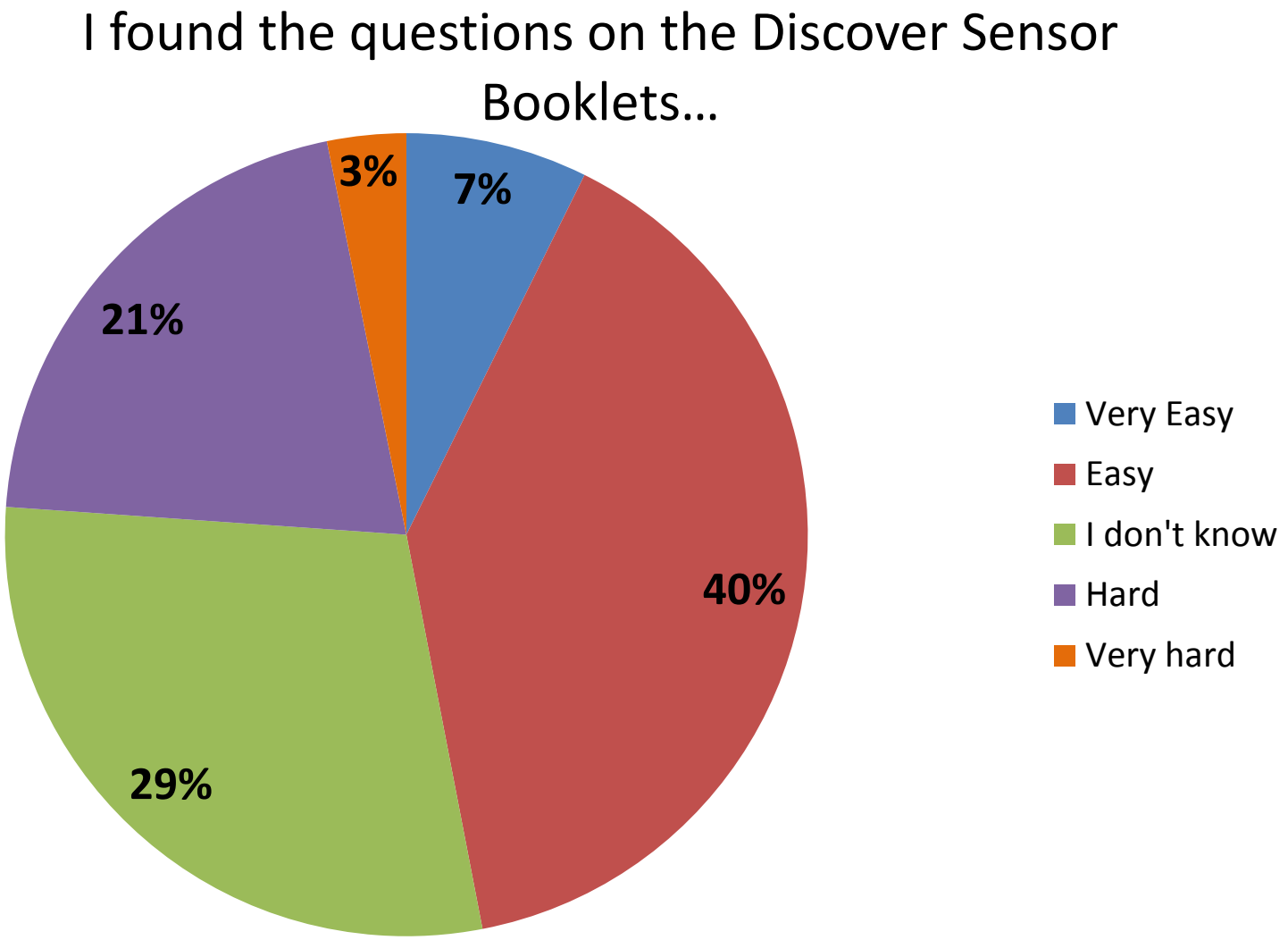
Strongly agree ☐ Agree ☐ I don't know ☐ Disagree ☐ Strongly disagree ☐

Reflection 1

In comparison to the rest of the class I consider myself to be ....

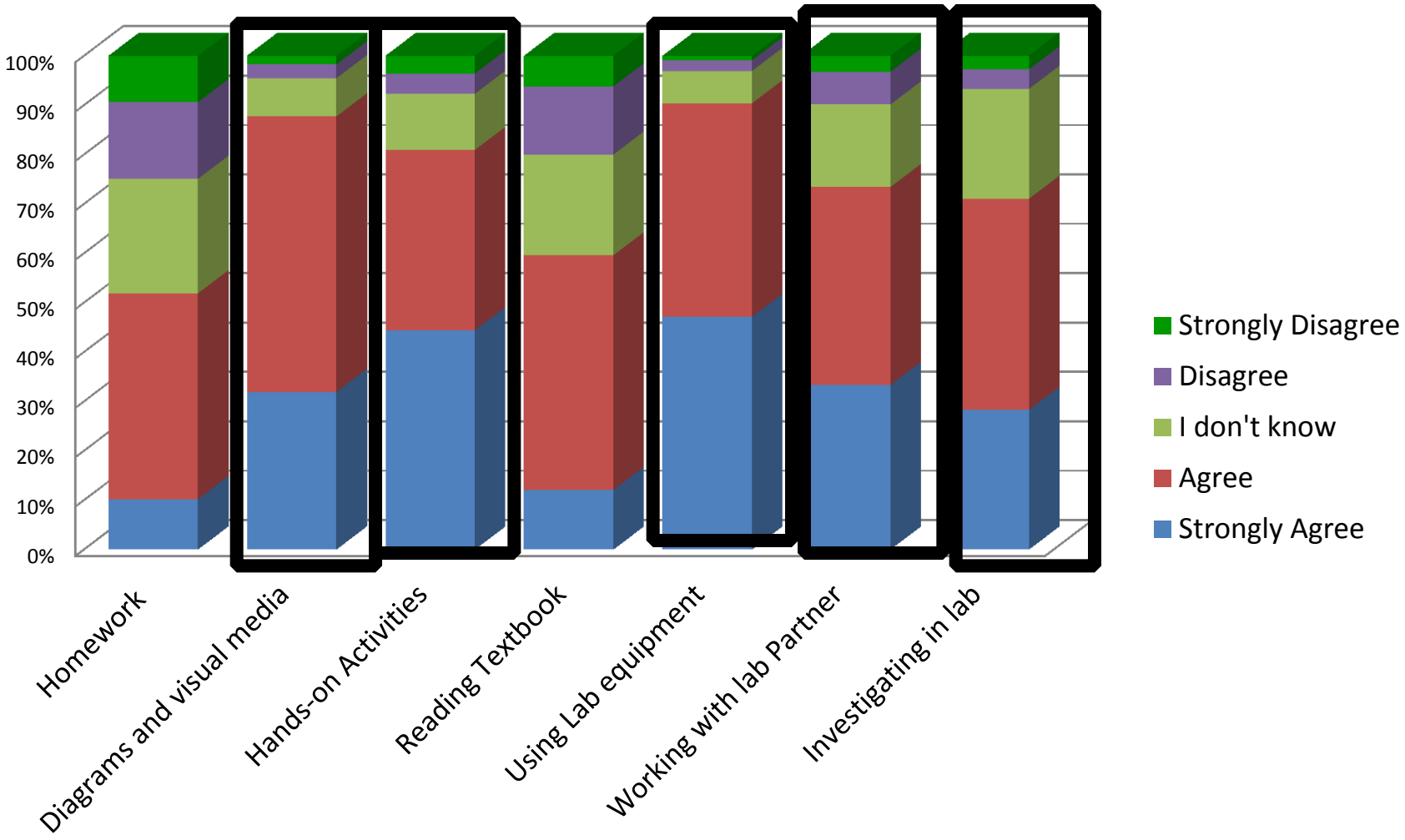


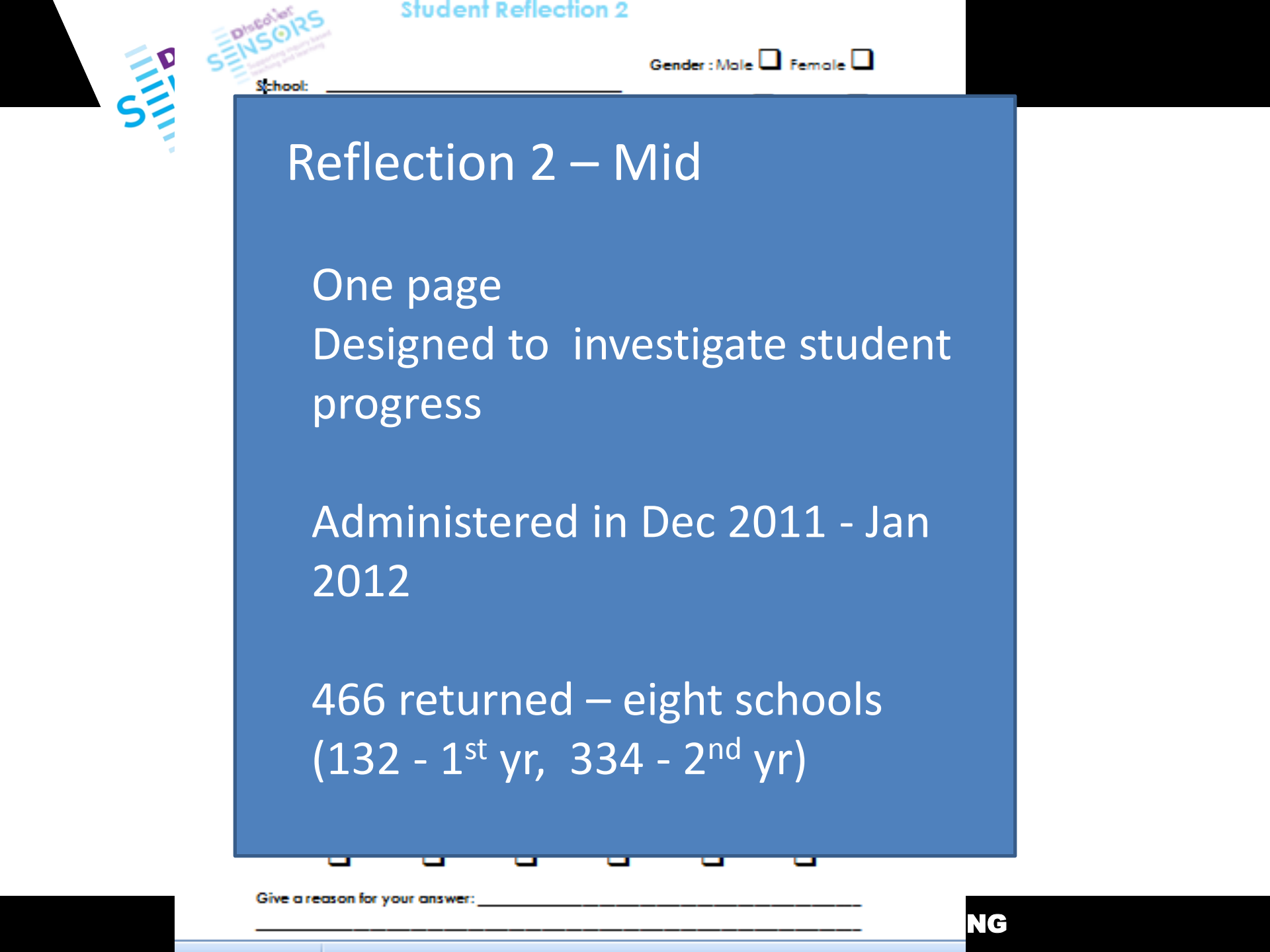
Reflection 1



Reflection 1

I learn will by doing...





Reflection 2 – Mid

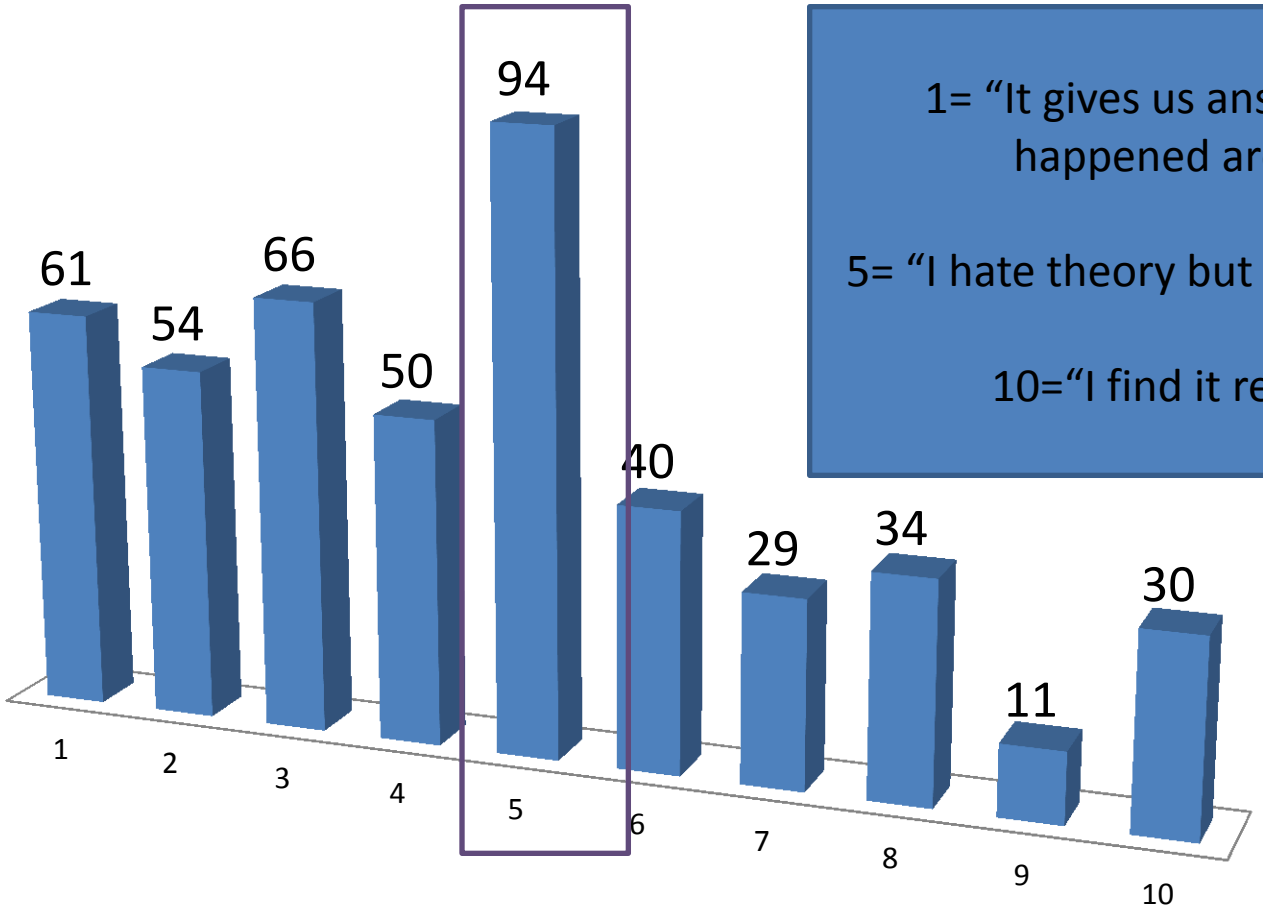
One page
Designed to investigate student progress

Administered in Dec 2011 - Jan 2012

466 returned – eight schools
(132 - 1st yr, 334 - 2nd yr)

Reflection 2

On a scale of 1 to 10 please select how you feel about science, with 1 = “I really enjoy science” and 10 = “I do not enjoy science at all”

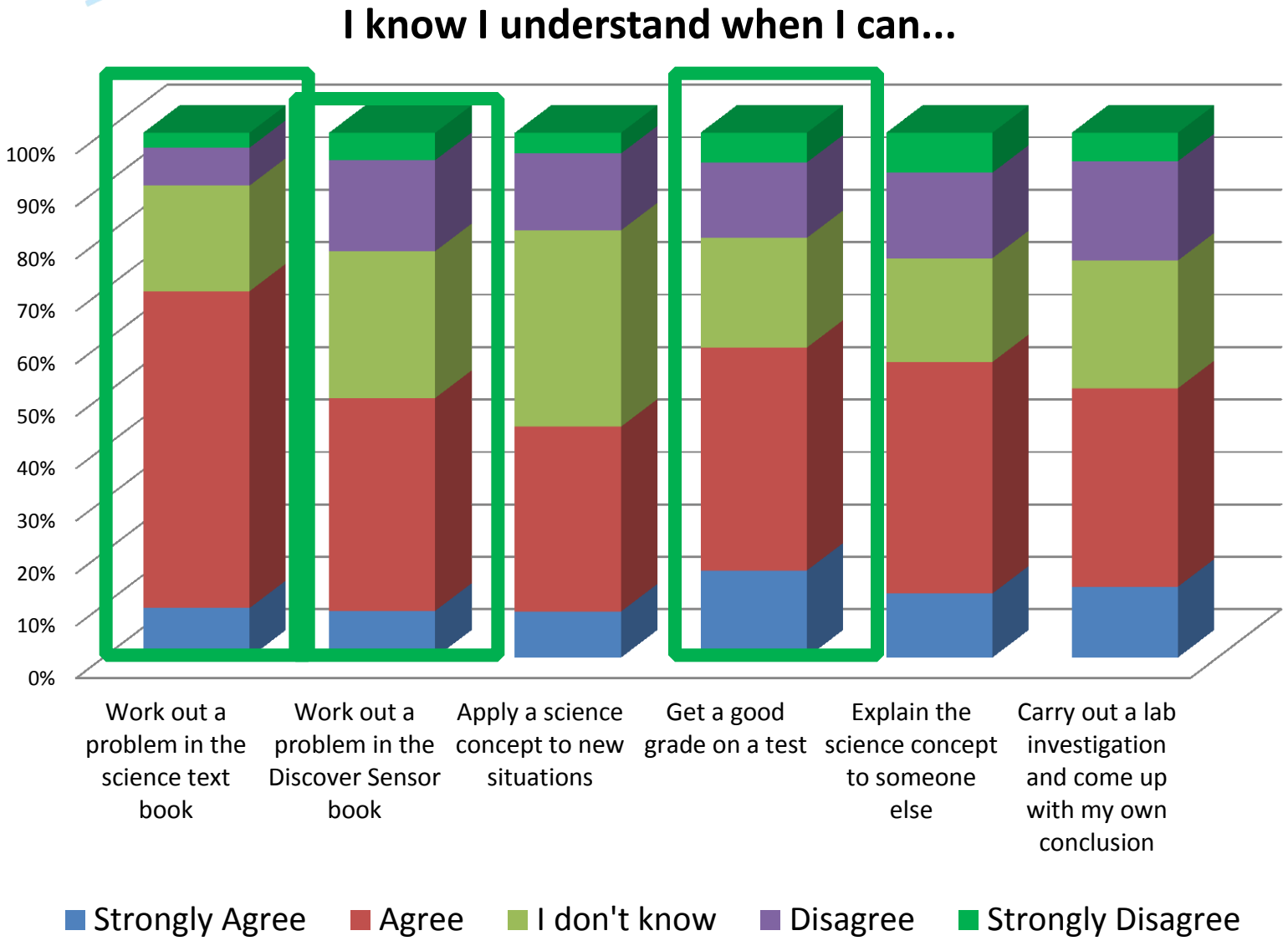


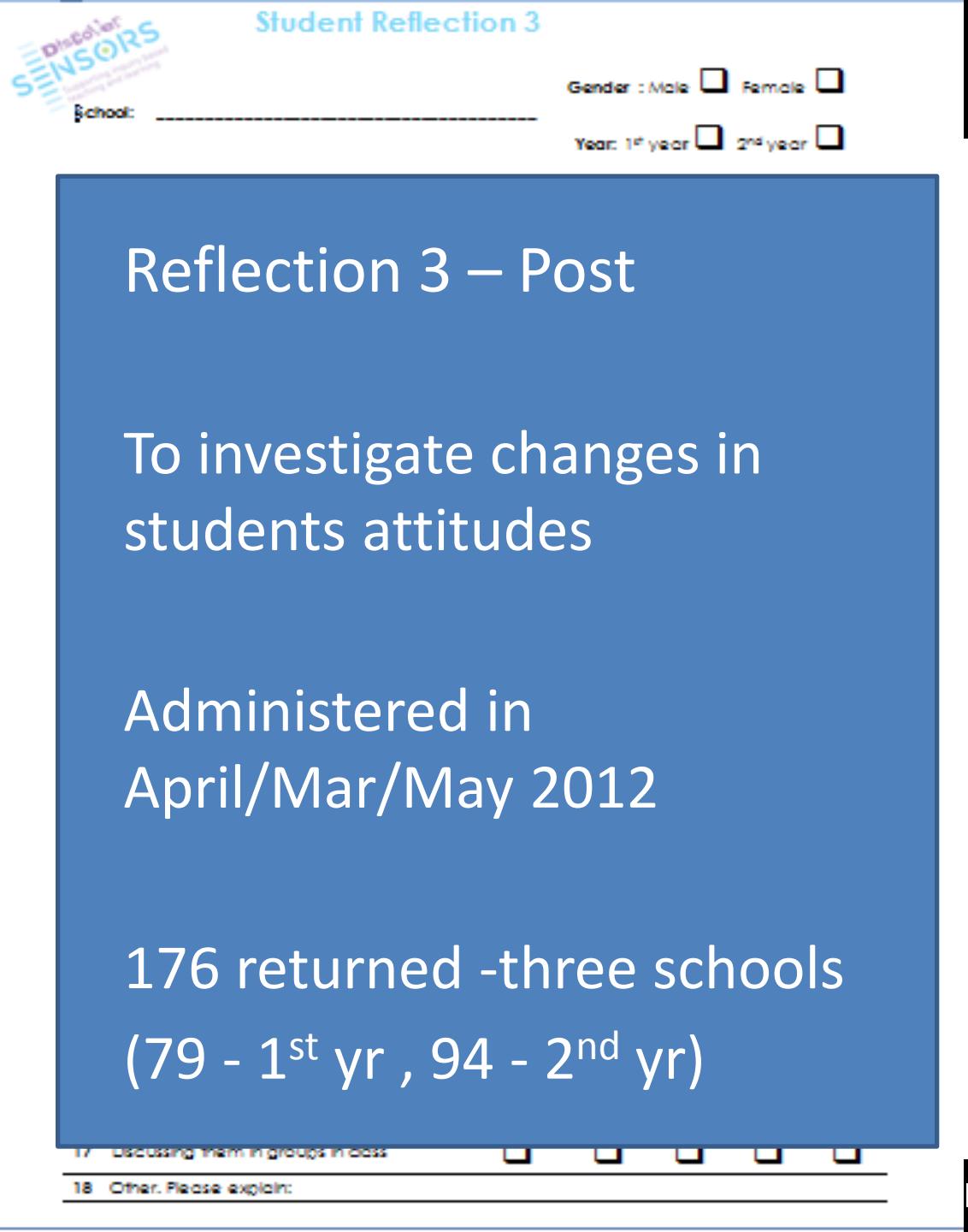
1= “It gives us answers to what happened around us”

5= “I hate theory but like experiments”

10=“I find it really hard”

Reflection 2





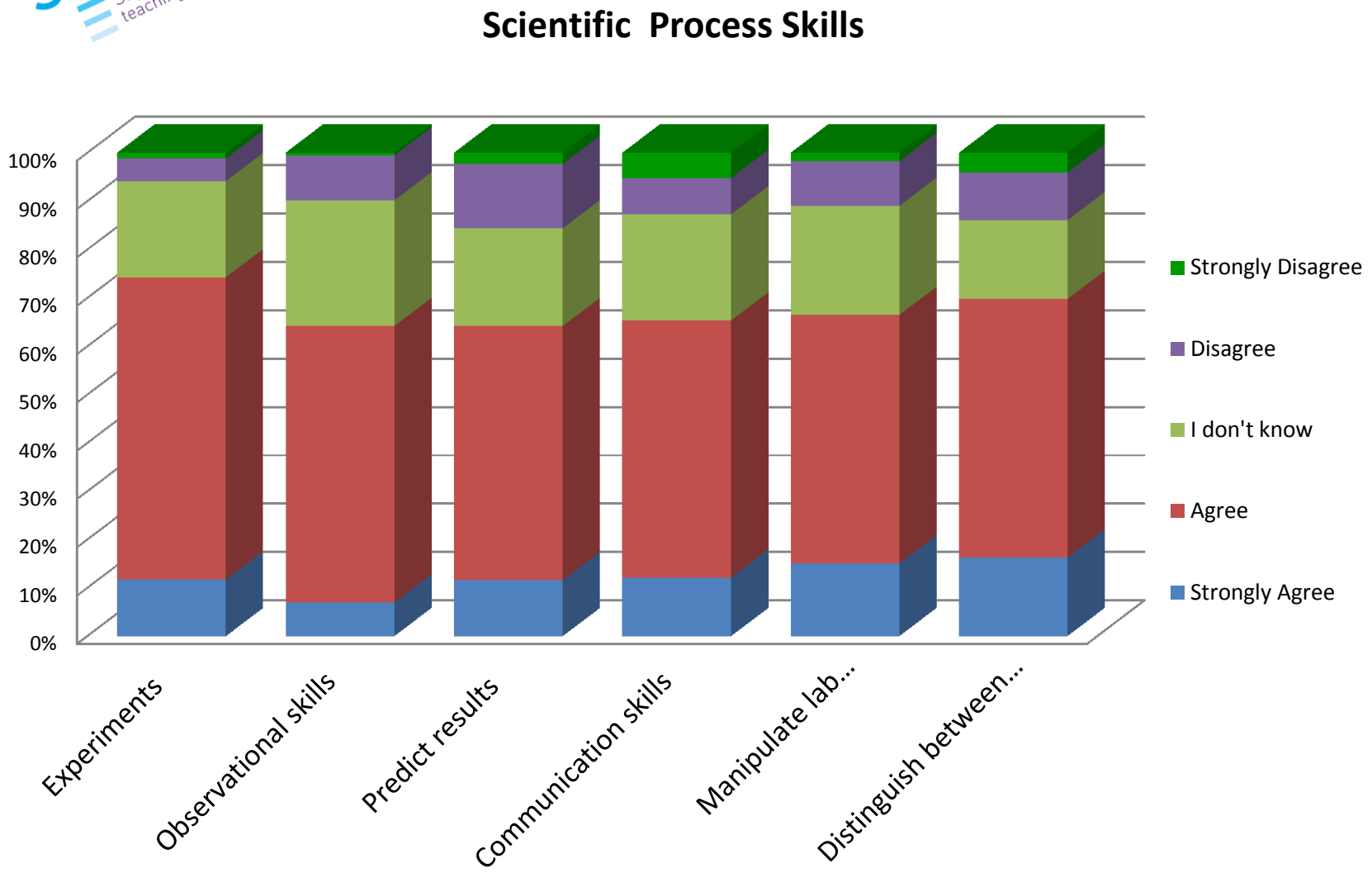
Reflection 3 – Post

To investigate changes in students attitudes

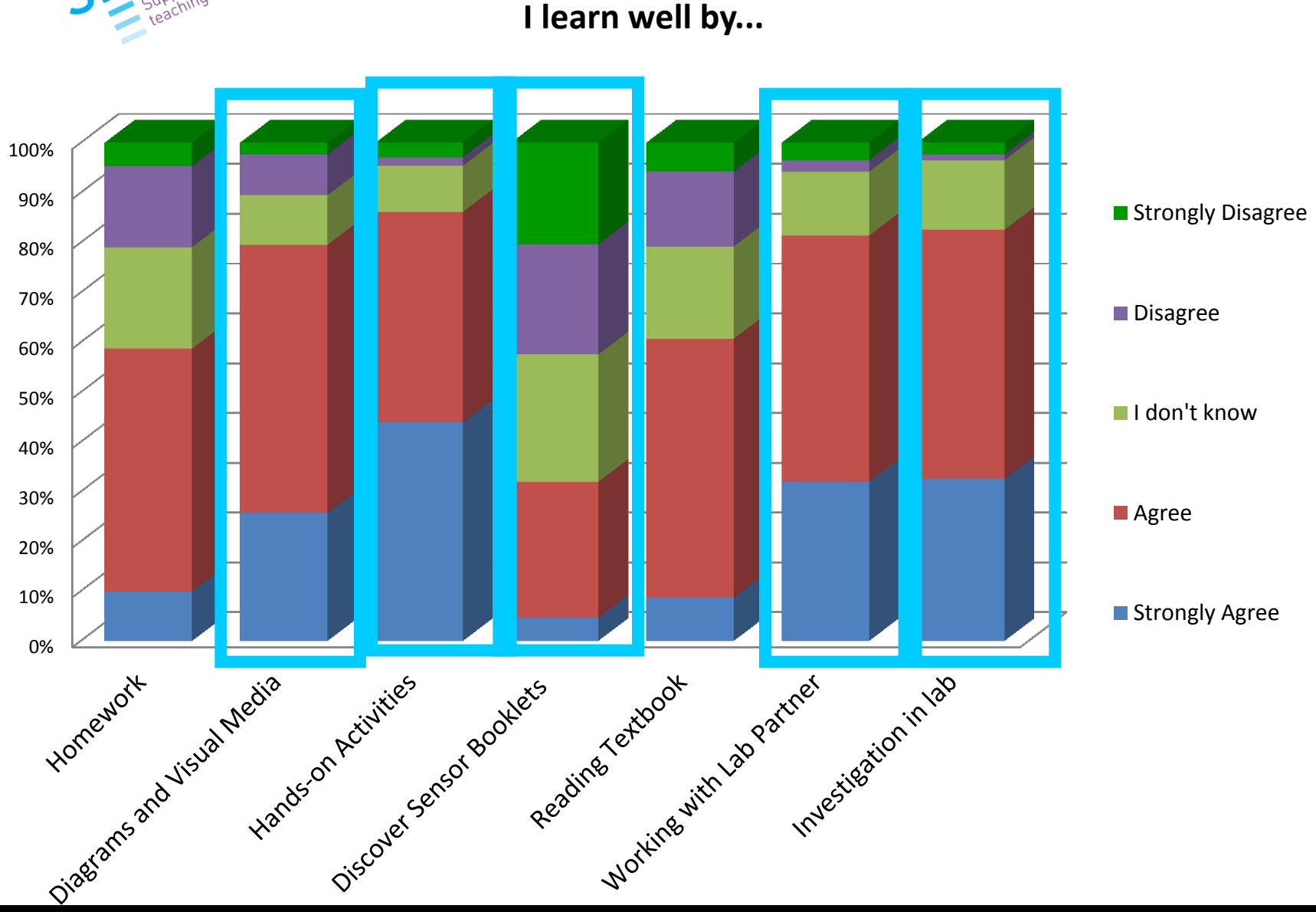
Administered in April/Mar/May 2012

176 returned -three schools (79 - 1st yr , 94 - 2nd yr)

Reflection 3

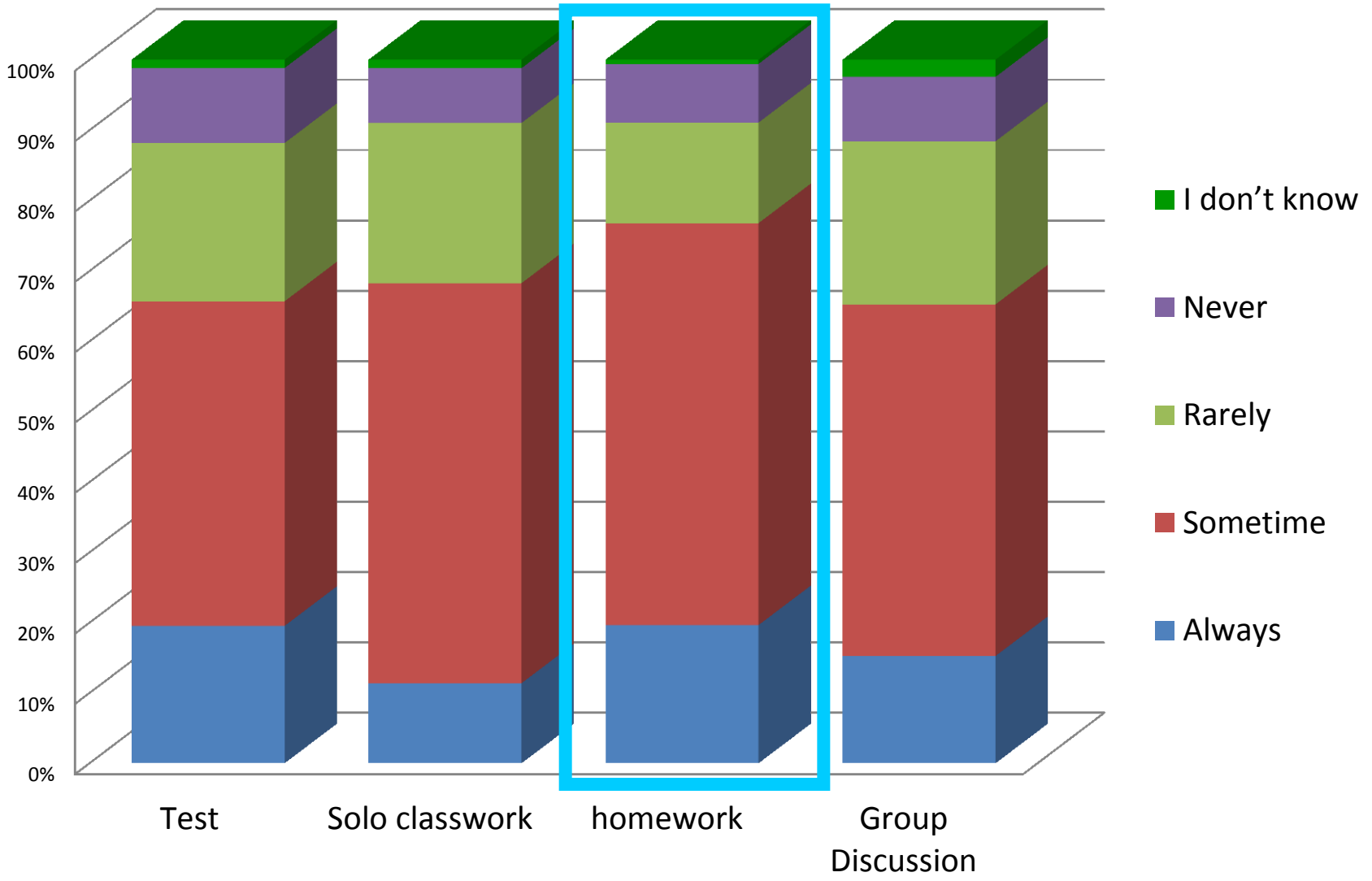


Reflection 3



Reflection 3

How Discover Sensors were completed



Conclusion

- Full report is being prepared
  - Assessment, questionnaire and interview data will be triangulated with reflective data
- Reflections are very insightful into student thinking
  - Low response rate in Reflection 3
- Students are enjoying Experiments and hands-on approach
  - Suggesting the inquiry based approach is working
- Next step: classroom observations

Acknowledgements

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sfi Science Foundation Ireland

University of Limerick
Ollscoil Luimnigh

www.discoversensors.ie

HEA
Higher Education Authority
An tÚdarás um Ard-Oideachas

www.nce-mstl.ie

Comhar na Sionna Shannon Consortium

Thank you for listening

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