

Sustainability in Higher Education for Information Technology and Computer Science – a review of the approach at the Hogeschool van Amsterdam

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Questions...

- Who thinks sustainability should somehow be included be in every subject we teach?
- Who thinks sustainability should be included in every curriculum?

Where I am coming from literally and figuratively.....

- Literally....
 - I am from the Hogeschool van Amsterdam (Amsterdam University of Applied Sciences) hereafter HvA
 - We have courses on many aspects of applied computing
 - I teach programming, web development, app development, algorithms and data structures and supervise student projects

- Figuratively....

The devil's advocate

- “We should have Sustainability in every subject and curriculum” – quote from a meeting I attended



- I think it is not practical or maybe even possible to include Sustainability in every subject or maybe even curriculum.

Computing and sustainability

- I think there is a case to be made that computers and IT can contribute to all of these, both positively and negatively.



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Teaching Sustainability

- Probably everyone in the room is concerned about sustainability
- Possible some of you think that it is so important that it or some reference to it should be in every curriculum or every subject.....



- What about other concerns such as ethics or religion?

Higher Education and Sustainability

- A double duty
 - Instruct students
 - Directly and indirectly
 - Be an exemplar of good practice
- Do we come up to scratch at HvA?



Teaching computer science – low level to high level

- Low level – learning the basics
 - How to program

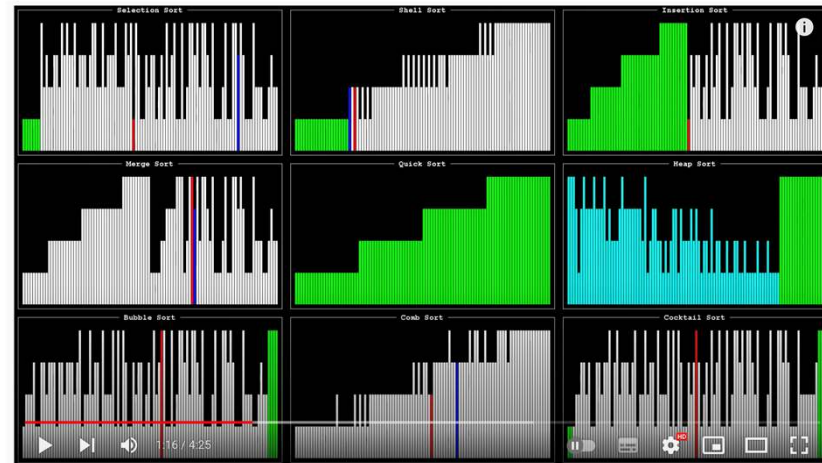
```
public static void main(String args[]) {  
  
    int x = 0;  
    int y = 10;  
  
    while (x < y) {  
        System.out.println("Loop line:" + x);  
        x = x+1;  
    }  
}
```



```
Loop line:0  
Loop line:1  
Loop line:2  
Loop line:3  
Loop line:4  
Loop line:5  
Loop line:6  
Loop line:7  
Loop line:8  
Loop line:9
```

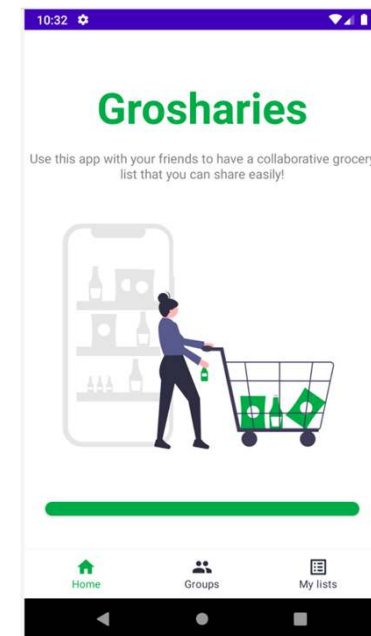

Mid level

- Mid level – assimilating the basics
 - An example is algorithms and data structures
 - Sorting data
 - Quick sort
 - Merge sort
 - Bubble sort
 - Insertion sort
 - Selection sort
 - [and others](#)
 - Which one do we choose?



High level

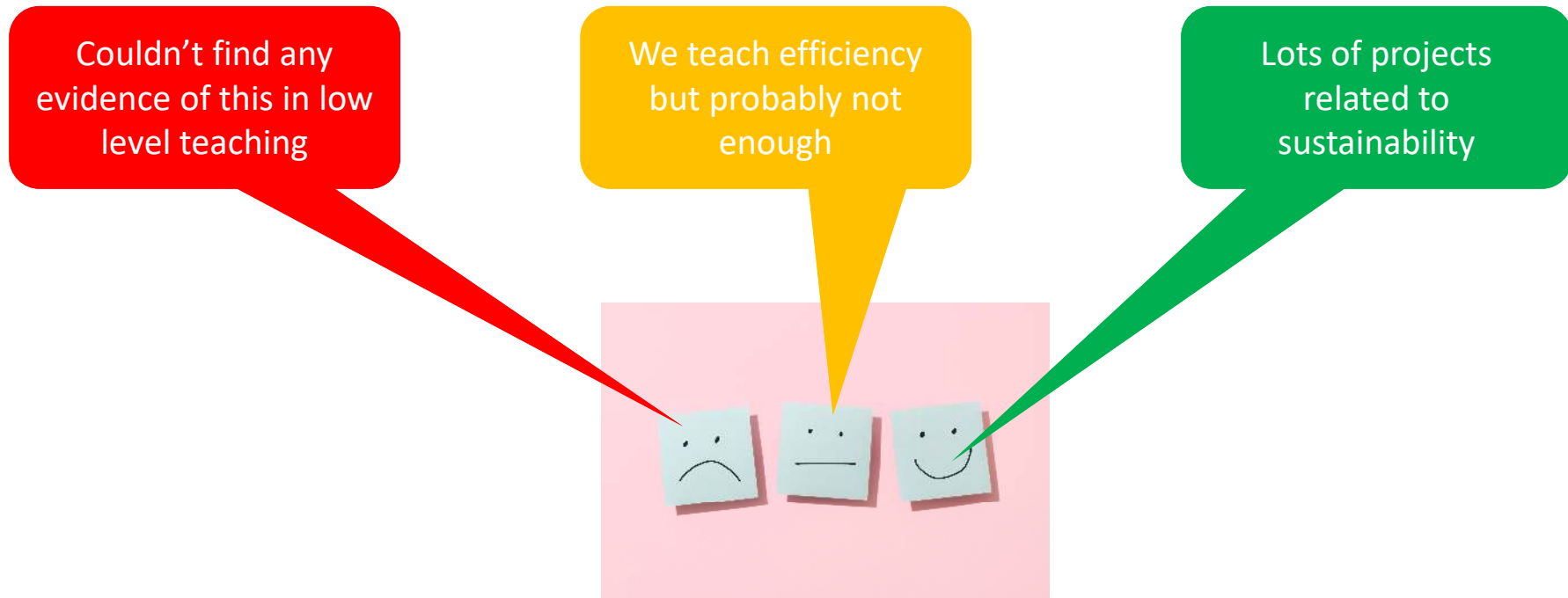
- Combining all elements to create software:
 - Build a system that does something
- This is the best opportunity to include elements of sustainability and we are doing quite well at that
 - Many student projects address the Sustainability Goals



Student project - grocery sharing app to cut down on food waste

How do we do across the levels?

- Based on my observation....



An Exemplar of Sustainability

- As an institution do we set a good example and teach our students by example?
- In this regard I think we are doing quite well
- Research
- Practical measures to help us contribute to being sustainable

Research

- We have a research group called [Responsible IT](#)*
- Responsibility includes Sustainability
- Research groups on Responsible IT including sustainability
- Involve students in projects about such topics and instigate projects about sustainability

* <https://www.hva.nl/kc-fdmci/gedeelde-content/lectoraten/lectoraat-responsible-it/lectoraat-responsible-it.html>

Student Project – Mailbox Cleanup Tool

The screenshot displays the Mailbox Cleanup Tool interface. At the top, there is a navigation bar with the title "Mailbox Cleanup Tool" and several menu items: "Over", "Instructie", "Ranglijst", "Providers", "Dashboard", a notification bell, and a user profile "Olivier De Wit". Below the navigation bar is a "Ga terug" button. The main heading is "mailboxcleantool@gmail.com" with "Gmail" underneath. A progress bar with four steps is shown: 1. Maak filter (active), 2. Verwijder emails, 3. Bekijk statistieken, and 4. Verzilver rewards. Below the progress bar are four panels:

- Filters**: "Stel filters in om je mailbox op te schonen!". Includes a dropdown menu "Selecteer een filter" with "Filter 6 - Dribbble filter" selected, an "Update filter" button, and a "Maak filter" button.
- Synchroniseren**: "Synchroniseer de ingestelde filters met je mailbox, dit kan handmatig of automatisch". Includes a dropdown menu "Selecteer een filter" with "Filter 6 - Dribbble filter" selected and a "Synchroniseer" button.
- Statistieken**: "Bekijk je energy besparingen, level en grafieken". Includes a "Bekijk je statistieken" button.
- Rewards**: "Bekijk en verzilver hier je gespaarde punten!". Shows "Nog te besteden punten: 5" and "Verzilverde punten: 0". Includes buttons for "Nog geen verzilverde punten" and "Punten verzilveren".

Student Project – Mailbox Cleanup Tool

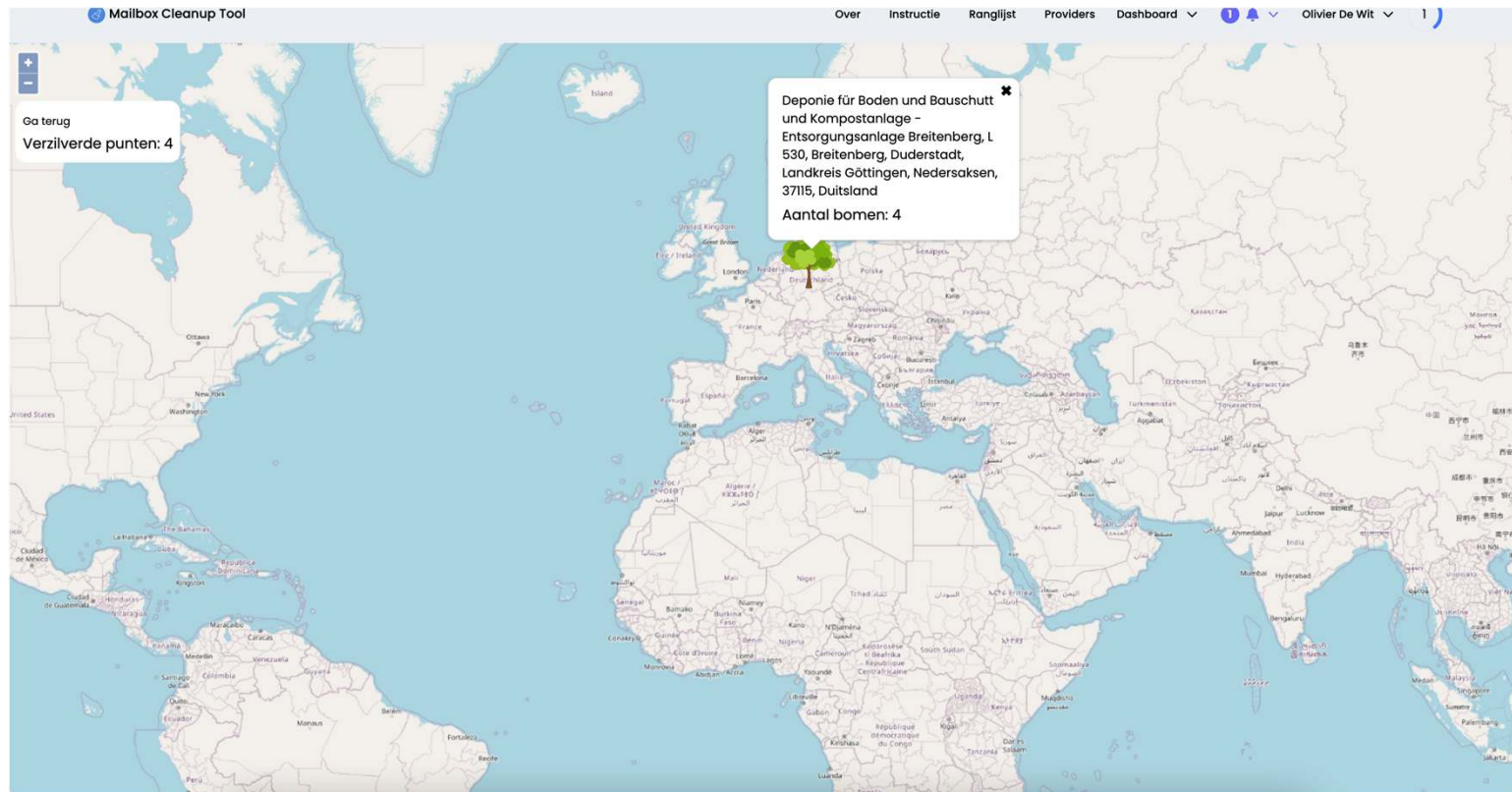


 **Emails succesvol verwijderd**

Je hebt **3.84** gram co2 per jaar bespaard. Bekijk nu je verwijderde emails in je Gmail prullenbak. Deze worden automatisch na 30 dagen verwijderd.

[Ga naar overzicht](#)

Student Project – Mailbox Cleanup Tool



Sustainable Practices

- We have a [Sustainability office](#) with many ideas, resources, initiatives and projects
- For example a decision has been made to issue staff with the [Fairphone](#)

Conclusion

- It is difficult to include teaching sustainability in some basic computing subjects
 - But we can do more to address certain issues
- HvA does quite well with more advanced “higher level” subjects
- HvA has made a considerable effort to promote the idea of sustainability and introduce sustainable practices.
- Any questions?