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 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.
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

```java
public static void main(String args[])
{
    int x = 0;
    int y = 10;

    while (x < y){
        System.out.println("Loop line:" + x);
        x = x + 1;
    }
}
```
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....

  Couldn’t find any evidence of this in low level teaching

  We teach efficiency but probably not enough

  Lots of projects related to sustainability
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
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.

Go 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?