

Wie werden die Studenten an der Uni auf ihren Beruf digital vorbereitet?

Digitalisierung als Bildung in der Ausbildung?



Bachelor's Degree Programme in Social Education

3½ years study programme consisting of two parts:

1. Basic professional competences (1 year and 3 months)
2. Specialisation (2 years og 3 months)
 - Early Childhood Education directed towards children age 0-5 years
 - School and Leisure time Education directed towards children and young people age 6-18
 - Social and special needs education directed towards all age groups



The Testpilots of Technology

In the book *Teknologiens testpiloter* (*The Testpilots of Technology*) Mehlsen asks the question:

How can we prepare children for a digital future?

In order to this we as (professional) adults must

- learn together with children
- focus on critical understanding of technology – and not just on technological skills
- focus on Bildung and creativity

(Mehlsen, 2016, s. 26)



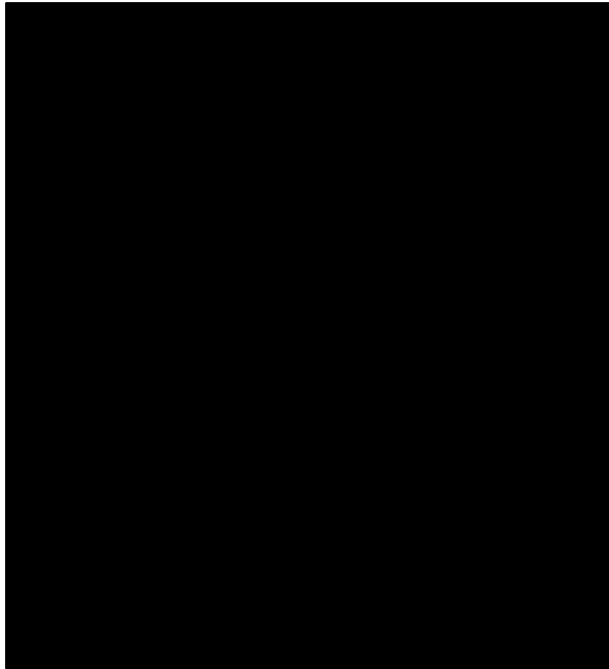
Google – the road to knowledge?

Google the word "Lampedusa" and look at the first 5 search results.

What can Google tell you about Lampedusa?

Google

Input: "Lampedusa" →



→ Output

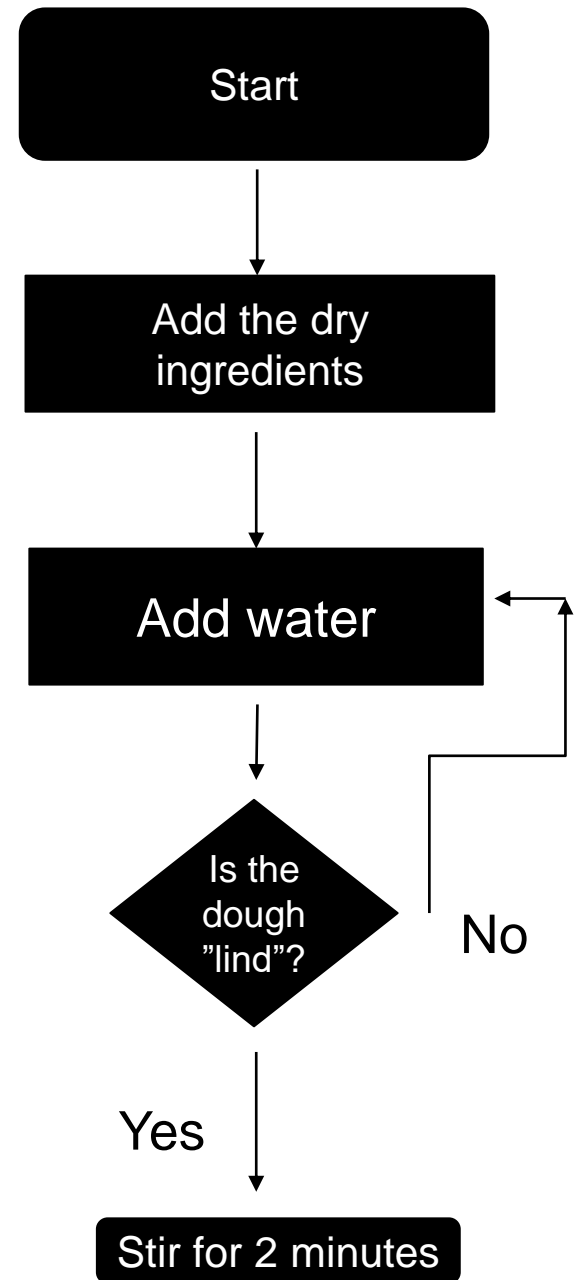


Algorithms

An algorithm = a sequence of instructions or a set of rules for performing an action

The following bread recipe could be an example of an algorithm:

- (1) Add the dry ingredients
- (2) Stir
- (3) Add $\frac{2}{3}$ of the water and stir
- (4) **If** the dough is "lind", **then** stir for 2 minutes. **Else** go to (3) and add more water



The Human Robot

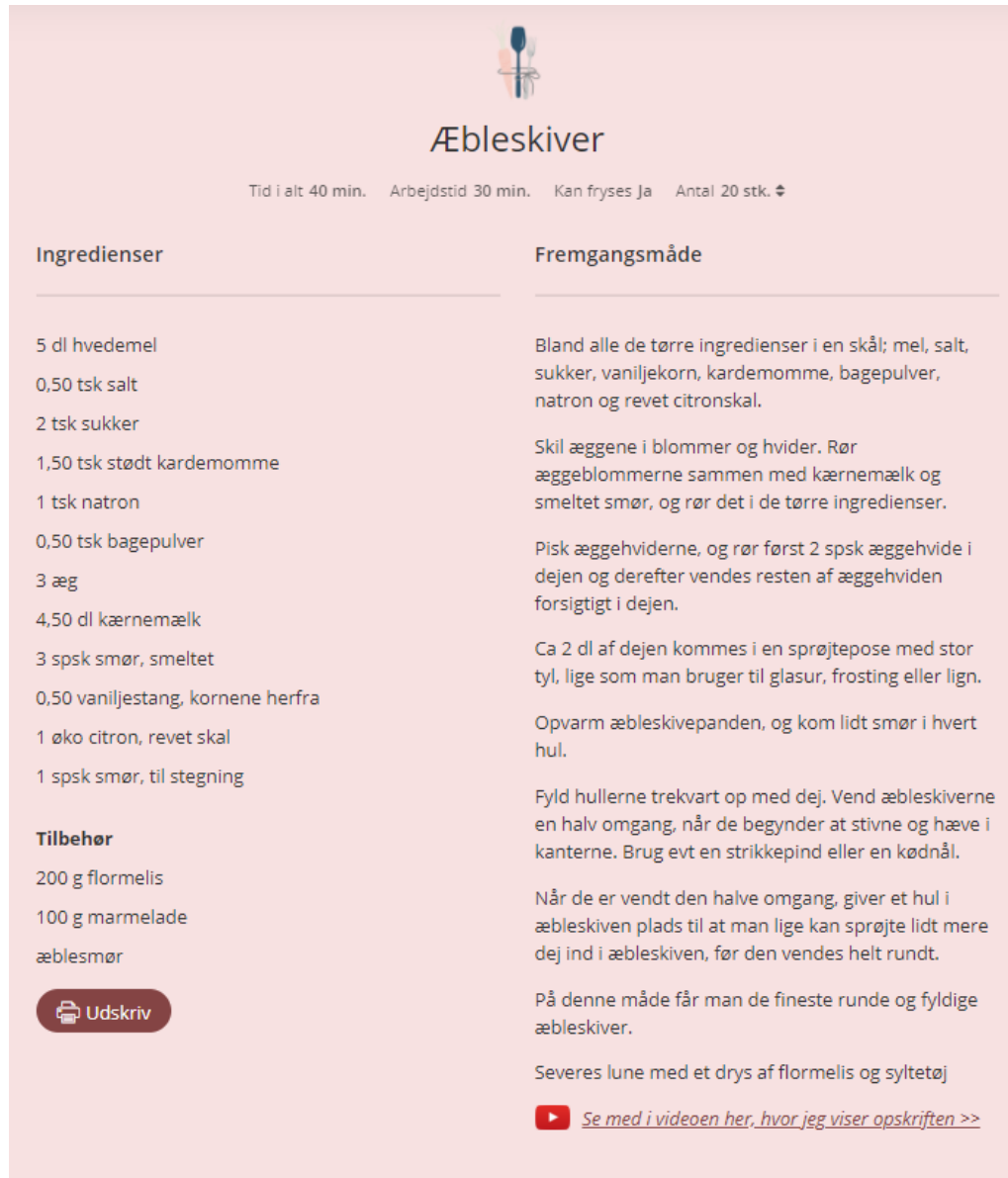


Computational thinking


- Dissolve problems into smaller problems, which can be solved one by one
- Use technology in problemsolving
- Test and debugging
- Knowledge sharing

(Korn et. al. 2018)

Computational thinking in the kitchen...



The image shows a recipe card for 'Æbleskiver' (Danish pancakes) on a light pink background. At the top center is a small icon of a blue fork and knife. Below it is the title 'Æbleskiver'. Under the title, there are details: 'Tid i alt 40 min.', 'Arbejdstid 30 min.', 'Kan fryses Ja', and 'Antal 20 stk.' with a small icon. The card is divided into two columns: 'Ingredienser' (Ingredients) on the left and 'Fremgangsmåde' (Instructions) on the right. The ingredients list includes flour, salt, sugar, cardamom, baking powder, eggs, milk, butter, vanilla, and lemon. The instructions describe the mixing process, cooking in a pan, and serving with powdered sugar and jam. At the bottom left is a 'Udskriv' (Print) button. At the bottom right is a video link: 'Se med i videoen her, hvor jeg viser opskriften >>'.



Æbleskiver


Tid i alt 40 min. Arbejdstid 30 min. Kan fryses Ja Antal 20 stk. ↕

Ingredienser

- 5 dl hvedemel
- 0,50 tsk salt
- 2 tsk sukker
- 1,50 tsk stødt kardemomme
- 1 tsk natron
- 0,50 tsk bagepulver
- 3 æg
- 4,50 dl kærnemælk
- 3 spsk smør, smeltet
- 0,50 vaniljestang, kornene herfra
- 1 øko citron, revet skal
- 1 spsk smør, til stegning

Tilbehør

- 200 g flormelis
- 100 g marmelade
- æblesmør

 Udskriv

Fremgangsmåde

Bland alle de tørre ingredienser i en skål; mel, salt, sukker, vaniljekorn, kardemomme, bagepulver, natron og revet citronskal.

Skil æggene i blommer og hvider. Rør æggeblommerne sammen med kærnemælk og smeltet smør, og rør det i de tørre ingredienser.

Pisk æggehviderne, og rør først 2 spsk æggehvide i dejen og derefter vendes resten af æggehviden forsigtigt i dejen.

Ca 2 dl af dejen kommes i en sprøjtepose med stor tyl, lige som man bruger til glasur, frosting eller lign.


Opvarm æbleskivepanden, og kom lidt smør i hvert hul.

Fyld hullerne trekvart op med dej. Vend æbleskiverne en halv omgang, når de begynder at stivne og hæve i kanterne. Brug evt en strikkepind eller en kødnål.

Når de er vendt den halve omgang, giver et hul i æbleskiven plads til at man lige kan sprøjte lidt mere dej ind i æbleskiven, før den vendes helt rundt.

På denne måde får man de fineste runde og fyldige æbleskiver.

Severes lune med et drys af flormelis og syltetøj

 [Se med i videoen her, hvor jeg viser opskriften >>](#)

Computational thinking in the kitchen...

Make an algorithm for doing the dishes (and no, you don't have a dish washer :-))



BeeBot race

Place the robot on the starting line and program it to:

- Drive around the plastic cup
- Cross the back line
- Turn 360 degrees around itself
- Go back and
- And stop as close to the starting line as possible

The winner is the team which comes closest to the starting line.



Theoretical perspectives

Seymour Papert – *Mindstorms* (1980)

Working with algorithms gives children concrete experiences with abstract concepts

Manuela U. Bers (2008)

Epistemological pluralism:

- Little engineers
- Little storytellers

Ozobots



Color code reference chart

OzoCodes

ozobot

SPEED

- SMALL EDGE
- FAST
- SLOW
- TURBO
- GRUZE
- NITRO BOOST

DIRECTION

- GO LEFT
- LINE JUMP LEFT
- U TURN
- GO STRAIGHT
- LINE JUMP STRAIGHT
- U TURN LINE END
- GO RIGHT
- LINE JUMP RIGHT

TIMERS

- TIMER ON (30 SEC. TO STOP)
- TIMER OFF
- PAUSE (3 SEC.)

COOL MOVES

- TORNADO
- ZIGZAG
- SPIN
- BACKWALK

WIN/EXITS

- WIN/EXIT (PLAY AGAIN)
- WIN/EXIT (GAME OVER)

COUNTERS

FOR GOING TO RIGHT

- ENABLE X-ING COUNTER
- ENABLE TURN COUNTER
- ENABLE PATH COLOR COUNTER
- ENABLE POINT COUNTER
- POINT +1
- POINT -1

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PAPER CALIBRATION

- Use a black dot slightly bigger than Ozobot to calibrate. If you are using markers, create a similar sized calibration dot using a black marker.
- Hold down the power button on Ozobot for 2 seconds until the top LED light flashes white.
- Quickly place Ozobot in the middle of the black calibration dot and let go.
- If calibration is successful, Ozobot will move and then blink green. Start over if Ozobot blinks red.

Storytelling with Ozobots



Ozobots

”A spaceship lands on an unknown planet...”

... and what happens next?

Tell the story with Ozobots, lines and colour codes.

Use ordinary felt-tip pens to illustrate your story.



Didaktical reflexion

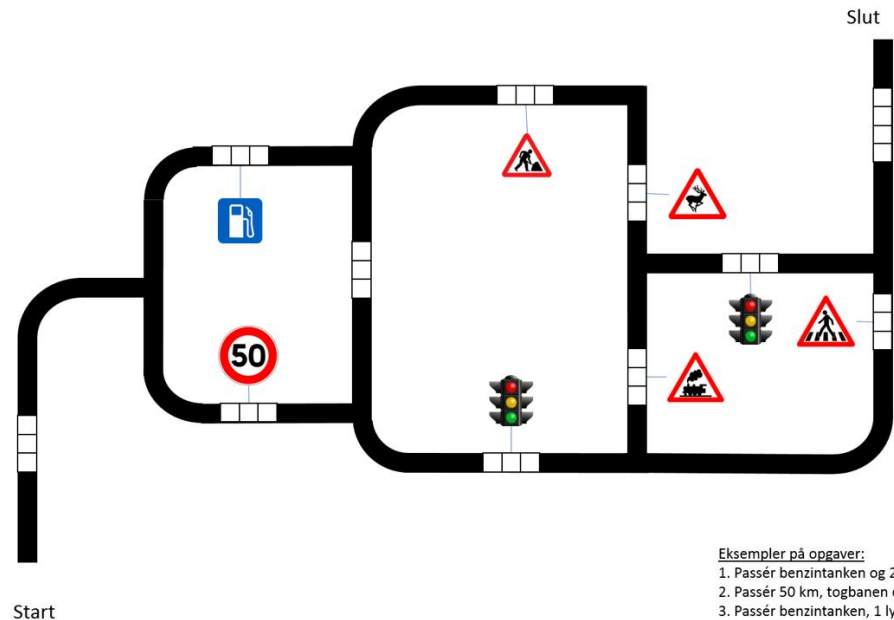
Example 1

”A spaceship lands on an unknown planet...”

... and what happens next?

Tell the story with Ozobots, lines and colour codes.

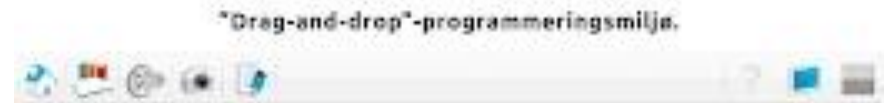
Example 2



Eksempler på opgaver:
1. Passér benzintanken og 2 lyskurver
2. Passér 50 km, togbanen og undgå vejarbejde
3. Passér benzintanken, 1 lyskurve og fodgængerfeltet
Find selv på flere muligheder.

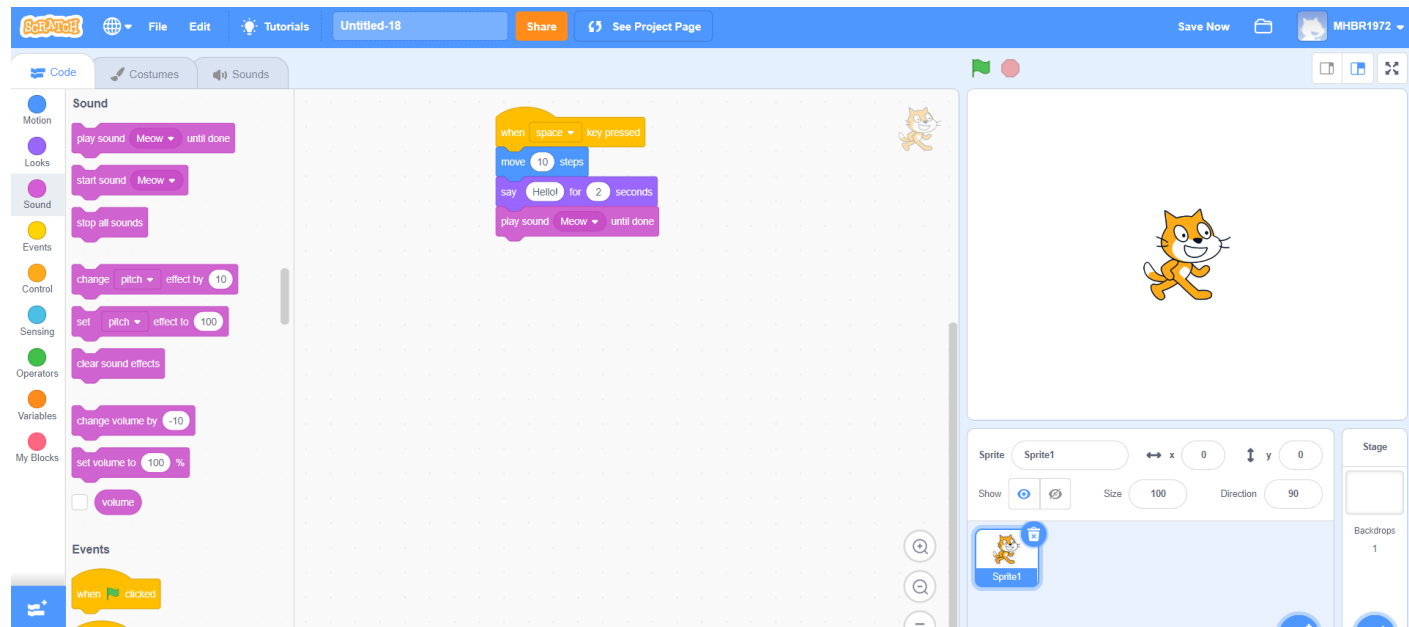
Discuss the difference between the two ways of organizing the learning process. What are the consequences for the children’s learning and Bildung?

Lego WeDo 2.0

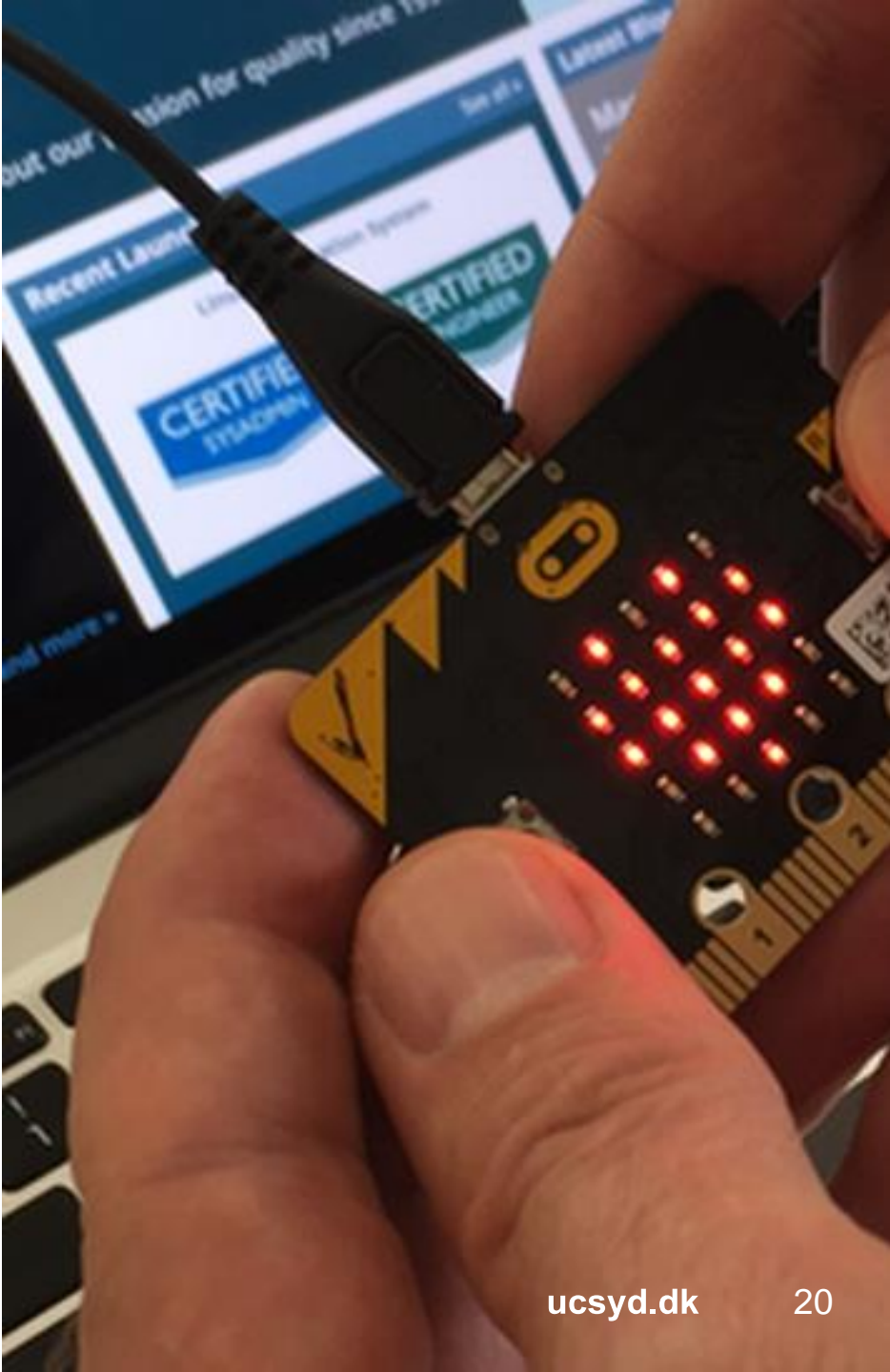


Scratch

<https://scratch.mit.edu/>



Micro:bits



Why should we work with coding in pedagogical practice?

Labour market competences

- Programming skills and knowledge
- Problem solving skills (computational thinking)

Critical understanding of technology

- A critical understanding of how algorithms condition our lives

Coding as a creative form of expression

