VIRTUAL REALITY OG INTERESSE FOR KLIMAFORANDRINGER

DESIGNWORKSHOP

KØBENHAVNS UNIVERSITET

6 MARTS 2019

PROGRAM

- 11-11.20: Overordnet om projektets formål og jeres rolle
  Guido Makransky, VLL, KU & Bjarke Lindsø Andersen, Epinion
- 11.20-11.30: Præsentationsrunde (underskrift af samtykkeerklæringer til videooptagelse)
- 11.30-11.50: Afprøvning af VR-simulationen '*This is Climate Change: Melting Ice*'
- 11.50-12.30: Frokost
- 12.30-12.45: Udvikling af forløb om klimaforandringer med henblik på myndiggørelse
  Simon Ryberg Madsen & Bjarke Lindsø Andersen, Epinion
- 12.45-15.00: Gruppearbejde om udvikling af undervisningsforløb (3 grupper)
- 15.00-16.00: Præsentation af gruppernes undervisningsforløb og fælles diskussion

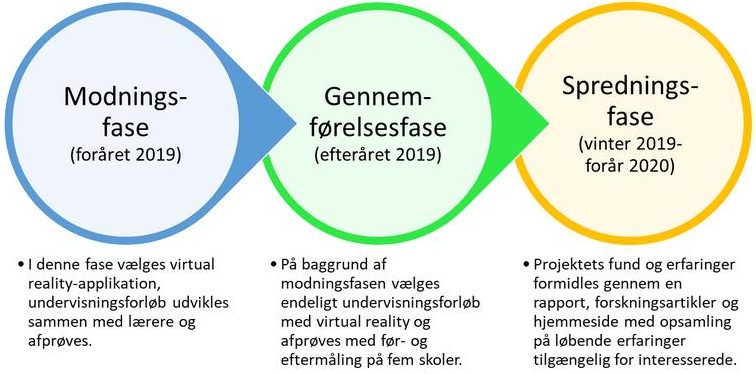
PRÆSENTATIONSRUNDE

(og samtykke)

PROJEKTET

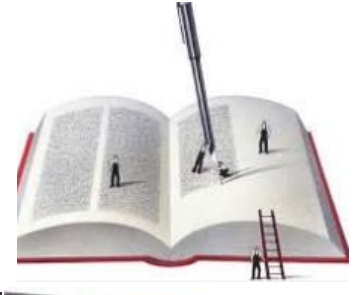
Formål og forløb

- Blive klogere på, **om VR kan bruges til at øge interessen for naturfaglige emner**
- Blive klogere på **faldgruber og potentialer ved VR i skolen**
- Blive klogere på, **hvad det kræver at integrere VR pædagogisk**



WHY IS IMMERSIVE VR INTERESTING PSYCHOLOGICALLY?

- All media is just a frame, a window into another world.
- But VR obliterates the frame, placing you inside the space (Milk, 2016).
- *"There is a major qualitative difference between VR and watching video. It feels real* (Bailenson, 2018, p 19).
- *The sensation of "being there" is psychological presence.*
- *When it happens, your motor and perceptual systems interact with the virtual world in a manner similar to how thy do in the physical world."* (Bailenson, 2018, p 19).
- Basically VR makes it posible to transport people to a different world, or a different reality.
- People learn by experience. With VR we can give experiences that feel real (first person perspective), but are impossible, dangerous or too expensive to do in the real world.



HOW DOES PRESENCE RELATE TO LEARNING?

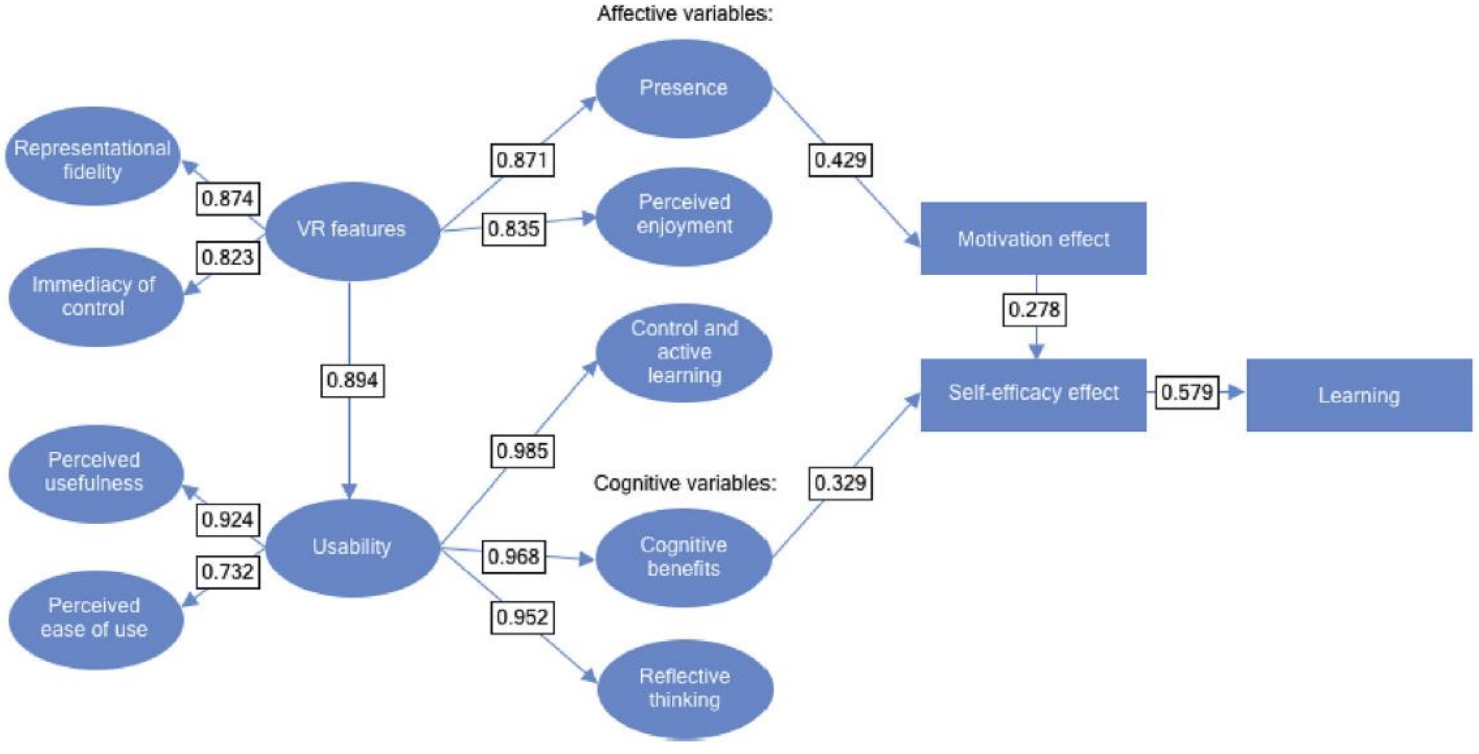
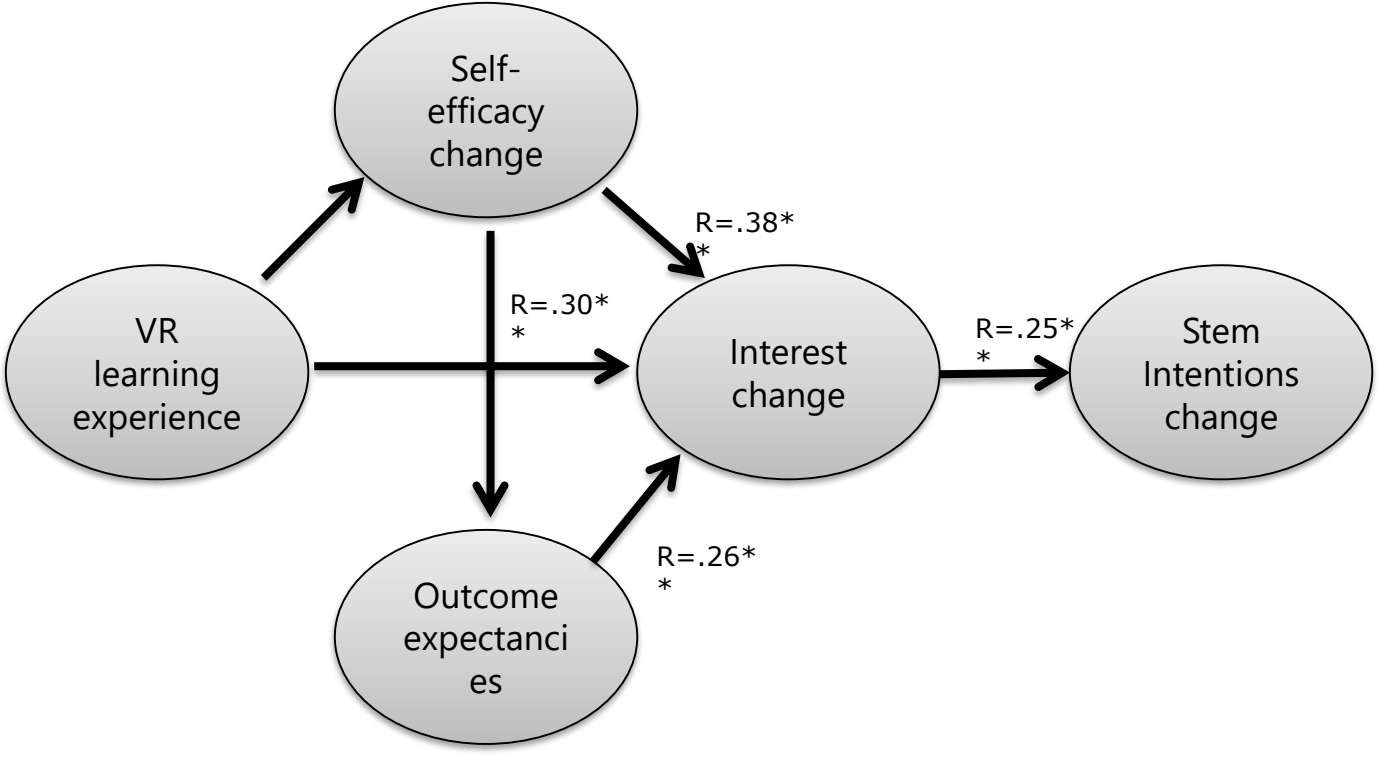


Fig. 3. The final model.

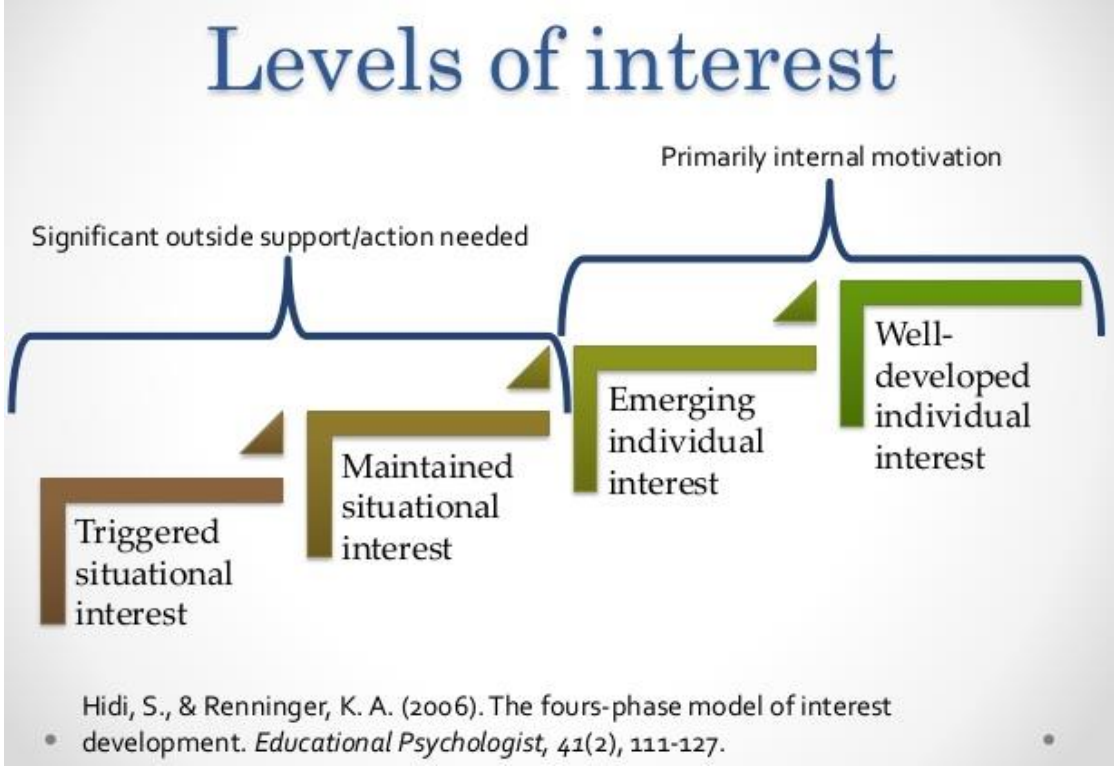
MAKRANSKY, G., PETERSEN G. B. (2019). INVESTIGATING THE PROCESS OF LEARNING WITH DESKTOP VIRTUAL REALITY: A STRUCTURAL EQUATION MODELING APPROACH. COMPUTERS & EDUCATION. HTTPS://DOI.ORG/10.1016/J.COMPEDU.2019.02.002

MAKRANSKY, G., & LILLEHOLT, L. (2018). A STRUCTURAL EQUATION MODELING INVESTIGATION OF THE EMOTIONAL VALUE OF IMMERSIVE VIRTUAL REALITY IN EDUCATION. EDUCATIONAL TECHNOLOGY RESEARCH AND DEVELOPMENT, 1-24. HTTPS://DOI.ORG/10.1016/J.CHB.2017.02.066

HOW DOES PRESENCE RELATE TO INTEREST?

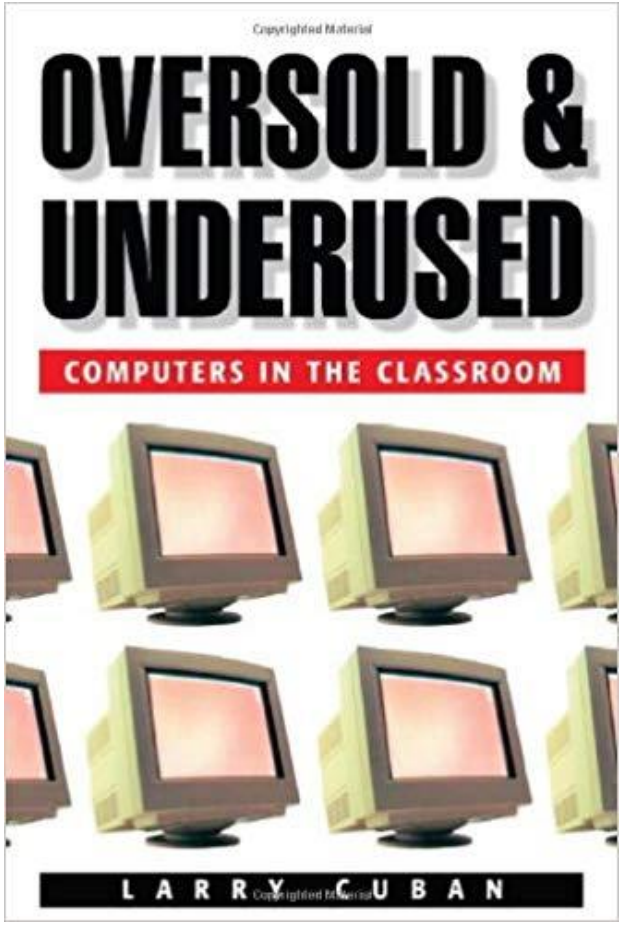


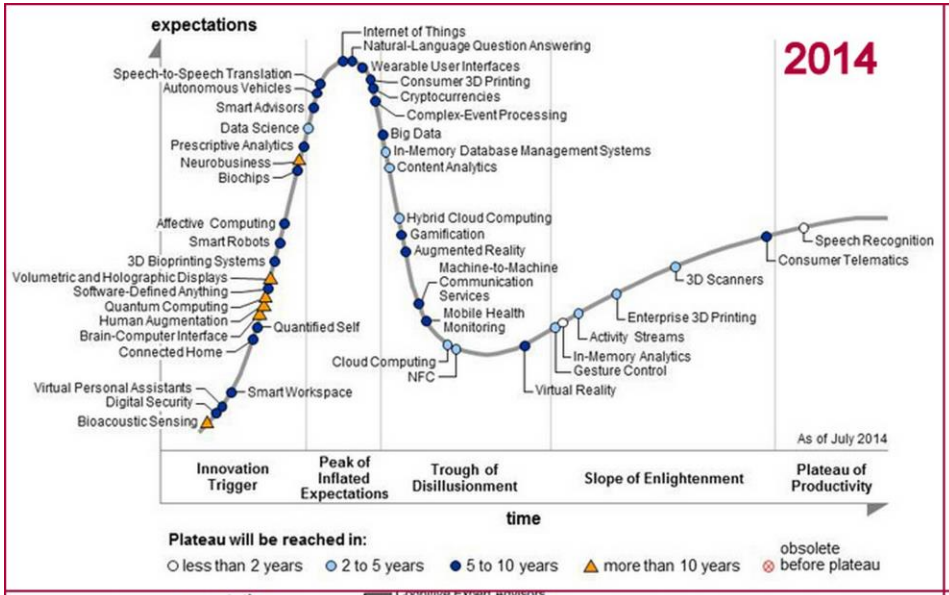
FOUR-PHASE MODEL OF INTEREST DEVELOPMENT

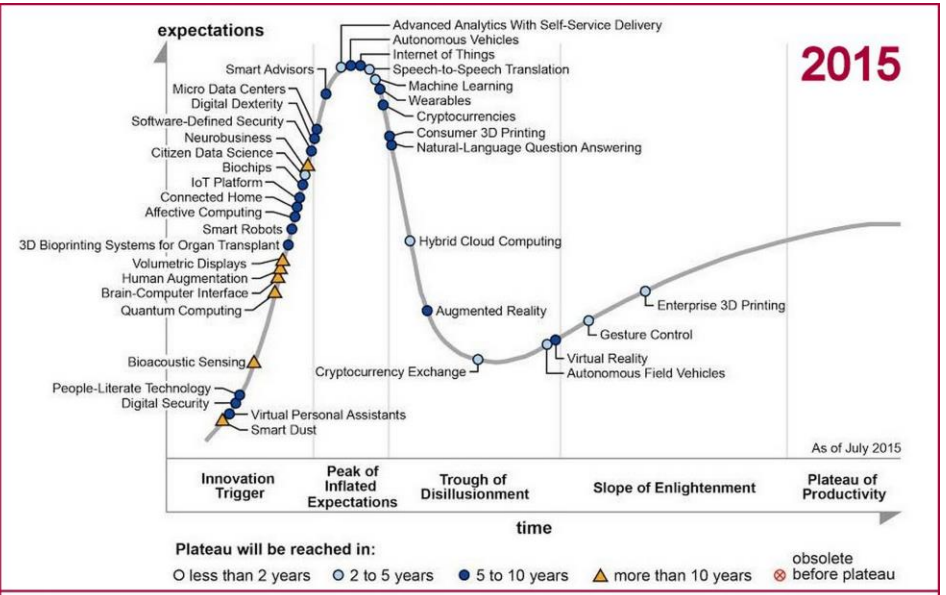


TEKNOLOGI I SKOLEN

- Bjarke (1-2 min)




2014
expectations
Internet of Things
Natural-Language Question Answering
Speech-to-Speech Translation
Autonomous Vehicles
Wearable User Interfaces
Consumer 3D Printing
Smart Advisors
Cryptocurrencies
Data Science
Complex-Event Processing
Prescriptive Analytics
Big Data
Neurobusiness
In-Memory Database Management Systems
Biochips
Content Analytics
Affective Computing
Hybrid Cloud Computing
Smart Robots
Gamification
3D Bioprinting Systems
Augmented Reality
Machine-to-Machine Communication Services
Volumetric and Holographic Displays
Software-Defined Anything
Quantum Computing
Mobile Health Monitoring
Human Augmentation
Quantified Self
Brain-Computer Interface
Activity Streams
Connected Home
Enterprise 3D Printing
Cloud Computing
NFC
In-Memory Analytics
Gesture Control
Virtual Personal Assistants
Virtual Reality
Digital Security
Smart Workspace
Bioacoustic Sensing
Speech Recognition
Consumer Telematics
3D Scanners
As of July 2014
Innovation Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
time
Plateau will be reached in:
less than 2 years
2 to 5 years
5 to 10 years
more than 10 years
obsolete before plateau


2015
expectations
Advanced Analytics With Self-Service Delivery
Autonomous Vehicles
Internet of Things
Speech-to-Speech Translation
Smart Advisors
Machine Learning
Micro Data Centers
Wearables
Digital Dexterity
Cryptocurrencies
Software-Defined Security
Consumer 3D Printing
Neurobusiness
Natural-Language Question Answering
Citizen Data Science
Biochips
IoT Platform
Connected Home
Affective Computing
Smart Robots
3D Bioprinting Systems for Organ Transplant
Hybrid Cloud Computing
Volumetric Displays
Human Augmentation
Brain-Computer Interface
Augmented Reality
Enterprise 3D Printing
Quantum Computing
Gesture Control
Bioacoustic Sensing
Virtual Reality
Cryptocurrency Exchange
Autonomous Field Vehicles
People-Literate Technology
Digital Security
Virtual Personal Assistants
Smart Dust
As of July 2015
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Slope of Enlightenment
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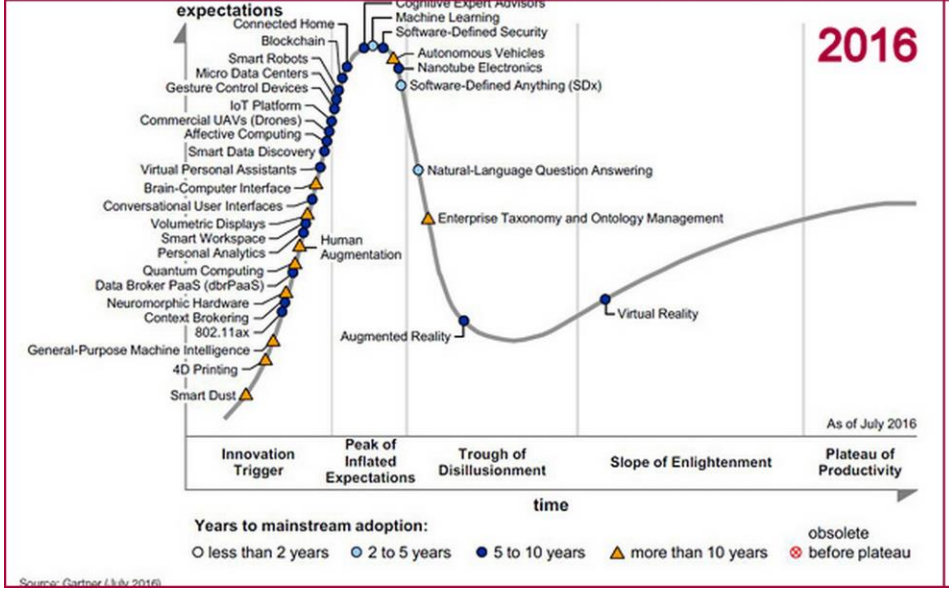
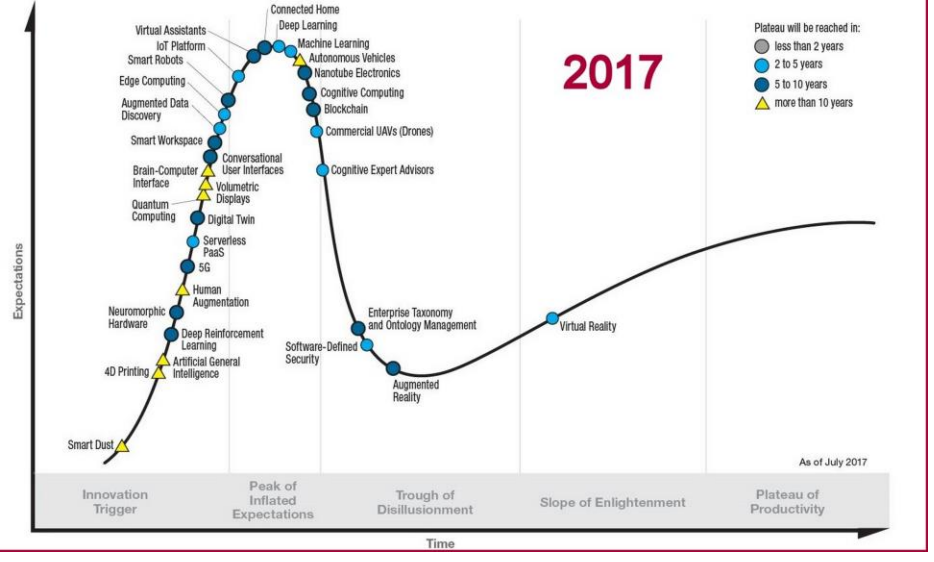

2016
expectations
Cognitive Expert Advisors
Connected Home
Machine Learning
Blockchain
Software-Defined Security
Smart Robots
Autonomous Vehicles
Micro Data Centers
Nanotube Electronics
Gesture Control Devices
Software-Defined Anything (SDx)
IoT Platform
Commercial UAVs (Drones)
Affective Computing
Smart Data Discovery
Natural-Language Question Answering
Virtual Personal Assistants
Brain-Computer Interface
Conversational User Interfaces
Enterprise Taxonomy and Ontology Management
Volumetric Displays
Smart Workspace
Human Augmentation
Personal Analytics
Quantum Computing
Data Broker PaaS (dbrPaaS)
Neuromorphic Hardware
Virtual Reality
Context Brokering
802.11ax
Augmented Reality
General-Purpose Machine Intelligence
4D Printing
Smart Dust
As of July 2016
Innovation Trigger
Peak of Inflated Expectations
Trough of Disillusionment
Slope of Enlightenment
Plateau of Productivity
time
Years to mainstream adoption:
less than 2 years
2 to 5 years
5 to 10 years
more than 10 years
obsolete before plateau
Source: Gartner (July 2016)


2017
Connected Home
Deep Learning
Virtual Assistants
Machine Learning
IoT Platform
Autonomous Vehicles
Smart Robots
Nanotube Electronics
Edge Computing
Cognitive Computing
Augmented Data Discovery
Blockchain
Commercial UAVs (Drones)
Smart Workspace
Conversational User Interfaces
Brain-Computer Interface
Cognitive Expert Advisors
Volumetric Displays
Quantum Computing
Digital Twin
Serverless PaaS
5G
Human Augmentation
Neuromorphic Hardware
Enterprise Taxonomy and Ontology Management
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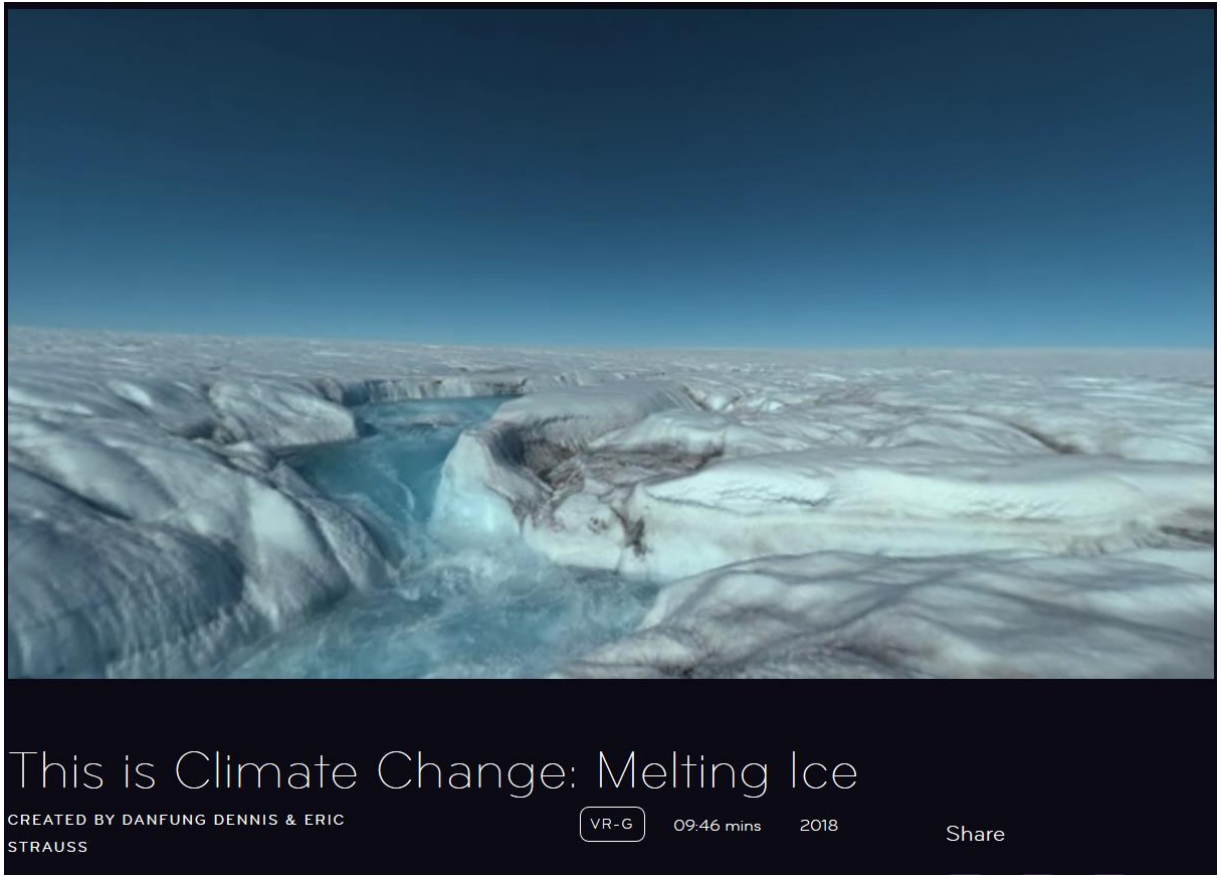
Time

AFPRØVNING: MELTING ICE



FROKOST

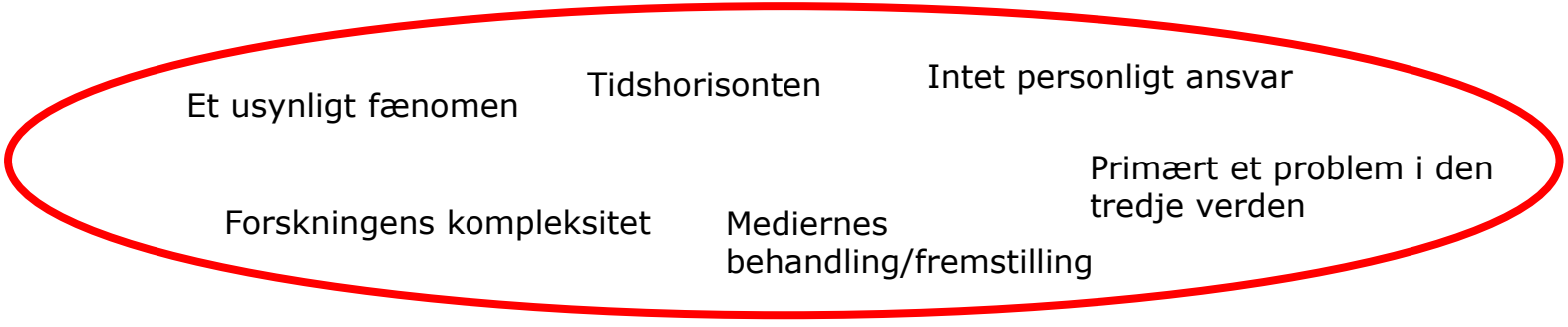
(½ TIME)

UNDERVISNING I KLIMAFORANDRINGER

Klimaforandringer er '**socio-scientific' problemstillinger** – de handler om menneskets sammenspil med natur, og nødvendigheden af at forstå sammenspillets naturvidenskabelige processer, for at kunne agere herpå i menneskelige fællesskaber og som individ.

Undervisning i klimaforandringer handler overordnet set om gennem undervisningen at opnå **tre mål** (Warriner, et all, 2003):

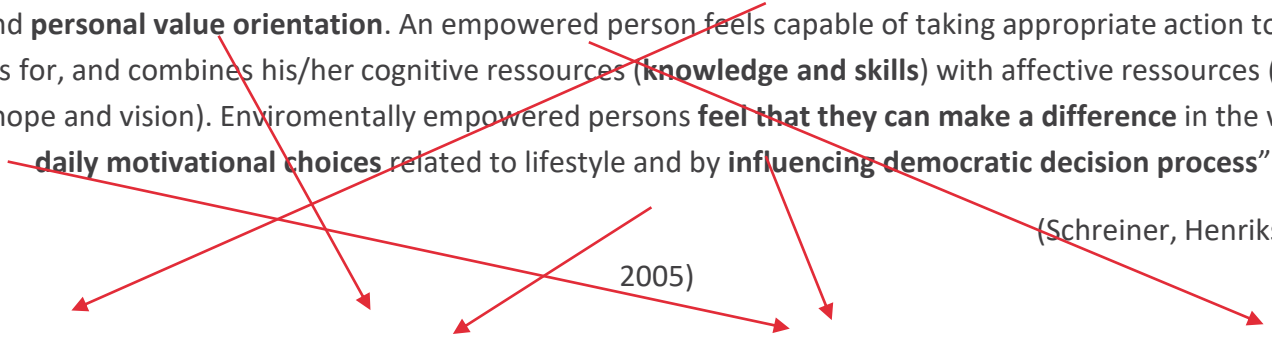
Dog er klimaforandringer så komplekse, at flere at fænomenets **karakteristika udfordrer undervisningens tre mål** (Schreiner, Henriksen og Hansen, 2005)**:**



UNDERVISNINGSMÅL: MYNDIGGØRELSE (EMPOWERMENT)

”Empowerment is a prerequisite for action and **includes content-specific knowledge** and cognitive skills, **motivational patterns** and **personal value orientation**. An empowered person feels capable of taking appropriate action to achieve what s/he aims for, and combines his/her cognitive ressources (**knowledge and skills**) with affective ressources (motivation, attitudes, hope and vision). Enviromentally empowered persons **feel that they can make a difference** in the world, both by **daily motivational choices** related to lifestyle and by **influencing democratic decision process**”.

(Schreiner, Henriksen og Hansen, 2005)



Viden og færdigheder

Viden om klima-forandringer

Færdigheder, til at arbejde med klimaforandringer

Motivationsmøns tre

Motivation for at lærer mere om klimaforandringer

Motivation for at gøre noget ved klimaforandringer

”Nødvendighedsfølelse”

Troen på det nytter

Troen på, at man kan gøre en forskel i sine daglige valg

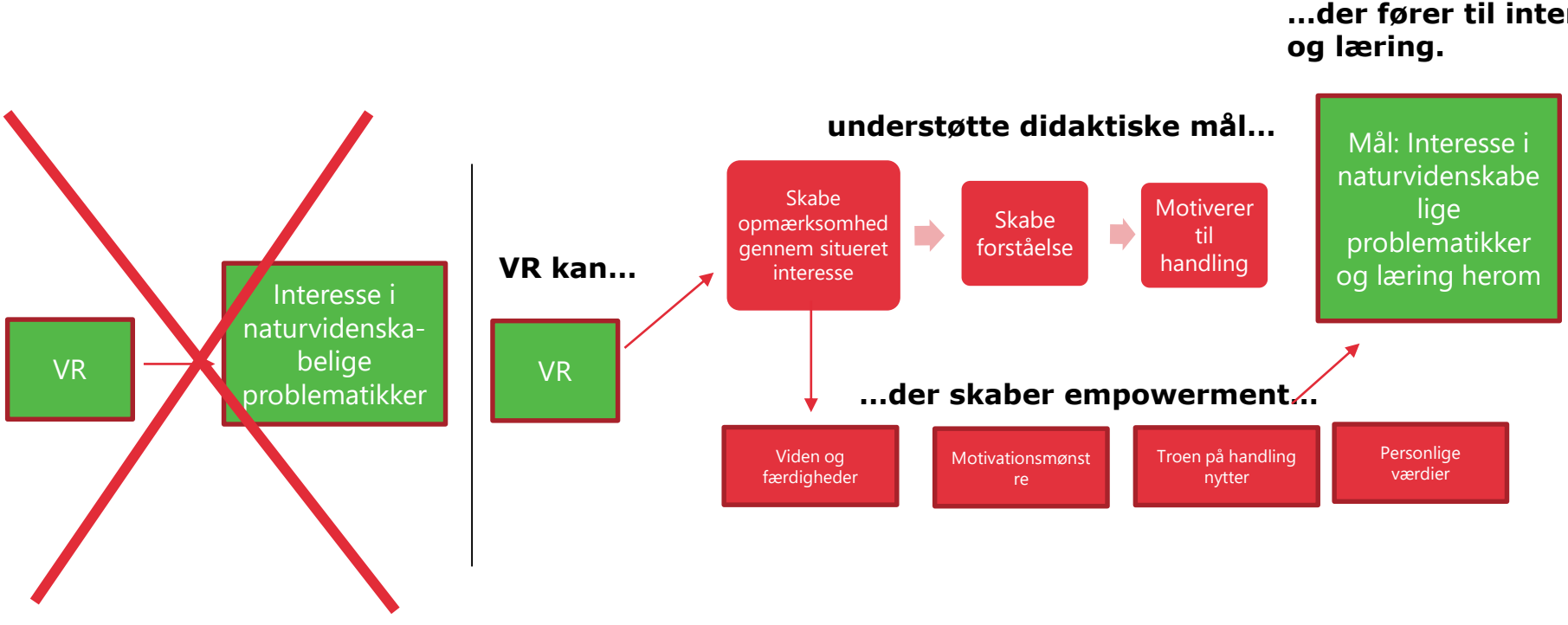
Troen på at man kan gøre en forskel i demokratiske processer

Personlige værdier

Værdier (fx empati, fællesskab, demokrati), der understøtter bestræbelsen

VIRTUAL REALITY – SITUERET OPMÆRKSOMHED

Vejen til øget interesse og læring for naturfaglige problemstillinger, går gennem ikke gennem VR-teknologi, men gennem at bruge VR-didaktik til at øge myndiggørelse og motivation hos eleverne.



UNDERVISNINGENS FORMÅL

Formålet med de undervisningsforløb, der skal udvikles, er at eleven opnår:

Viden

Viden om, hvorfor og i gennem hvilke processer global opvarmning finder sted. Her med særligt fokus på menneskelige aktiviteters indflydelse.

Viden

Viden om, hvordan forskellige processer kan nedbringe menneskelige aktiviteters effekt på global opvarmning

Færdigheder

Færdigheder i at analysere en konkret problemstilling omkring global opvarmning, sætte hypoteser op for, hvordan global opvarmning kan reduceres og formidle forslaget overbevisende.

Kompetence

Kompetencer til at bruge viden om global opvarmning og effektreducerende processer, til at analysere sig frem til tiltag man kunne foretage på enten samfundsmæssigt eller individuelt plan.

Dannelse

Højere grad af myndiggørelse og oplevelse af klimaforandringer som vedrørende. Herunder øget interesse og motivation for at lære om og handle på klimaforandringer, samt oplevelse af, at viden og handling kan gøre en forskel.

Formålene er formuleret med inspiration fra Fælles Mål for geografi, FN's verdensmål og projektets formål, som er at undersøge, om elevernes interesse for naturvidenskab kan styrkes med brug af virtual reality.

MATERIALER OG ØVELSER TIL PROBLEMBASERET DIDAKTIK

Vi lægger op til at man i designet af sit undervisningsforløb omkring klimaforandringer, lader sig inspirere af en problembaseret tilgang. Til inspiration præsenterer vi to forskellige tilgange til at arbejde problembaseret.

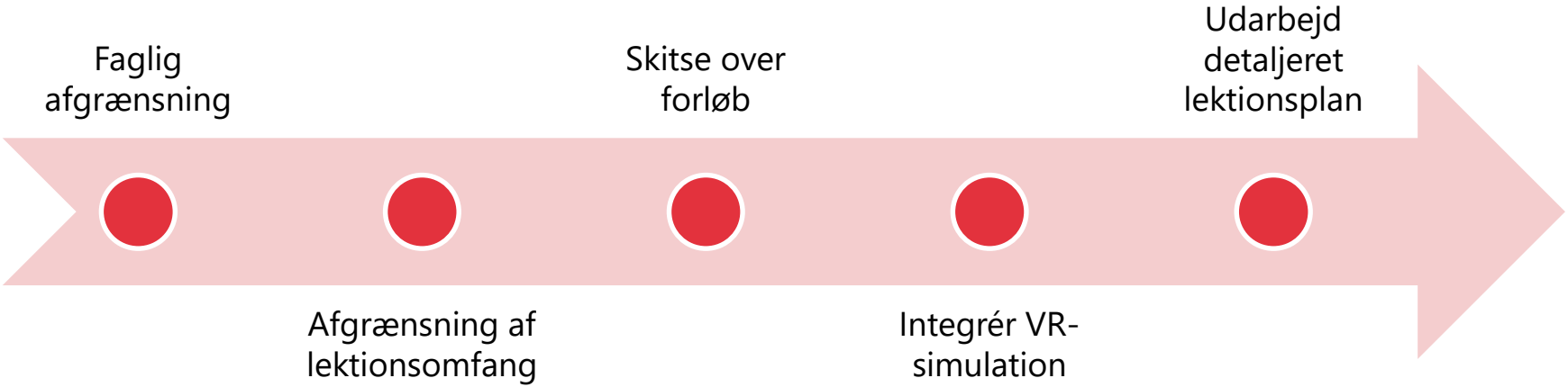
Rollespil (makroplan)

- **Udgangspunkt**: Rollespil som videnskabskvinde/mand, der skal finde og løse klimaudfordringer
- **Genstand**: De store, teoretiske og globale problemer, samt løsninger
- **Makroplan:** Fx hvordan kan vi kontrolleret øge/formindske albedo-effekten på verdensplan?
- **Didaktisk inspiration**: Inquiry Based Science Learning

Hverdagens problemer (mikroplan)

- **Udgangspunkt**: Eleverne undersøger deres egen hverdag, hjem eller lokalmiljø
- **Genstand**: De nære, hverdagsproblemer og praksissituationer omkring klima
- **Mikroplan:** Fx hvilket klimaaftryk sætter de varer, min familie køber i Netto og hvad kan vi gøre anderledes i vores hverdag?
- **Didaktisk inspiration**: Scenariedidaktik

INTRODUKTION TIL GRUPPEARBEJDET – DESIGN SPRINT



GRUPPEARBEJDE

(2 TIMER)

HVER GRUPPE PRÆSENTERER DERES FORLØB I 10 MINUTTER MED 10 MINUTTERS FÆLLES DISKUSSION