

# Intelligent undervisning: Når menneske og maskine mødes i klasselokalet

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Vores fokus

Hvordan fungerer en sprogmodel?

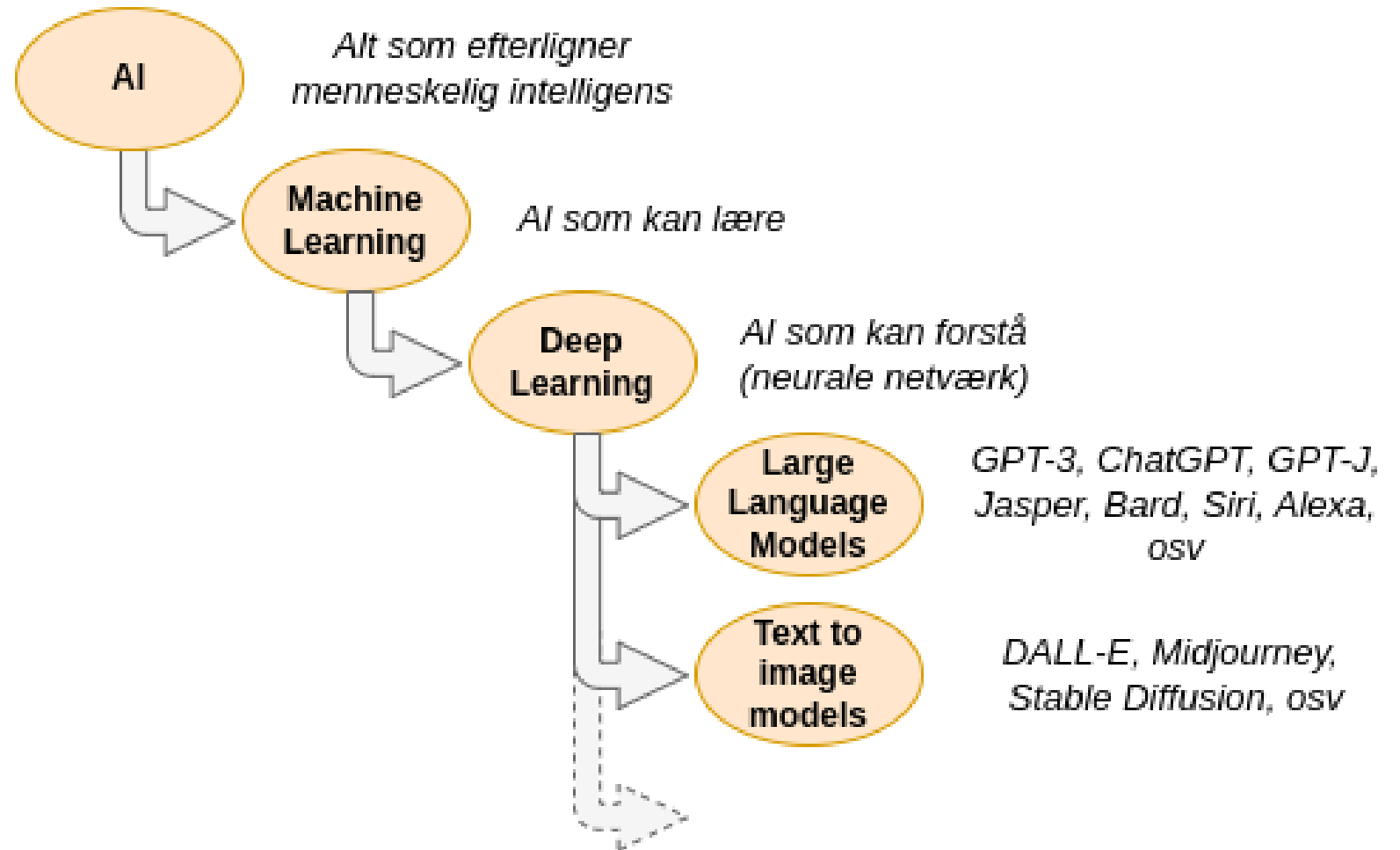
Fire typiske spørgsmål om AI

ChatGPT som assistent

Anvendelse i Forskningsarbejde

Hvor skal vi hen herfra?

# AI i kontekst



# Typer af AI

- Der findes mange former for AI, mange anvendelser, og mange måder de trænes på
- To af de største typer lige nu, er Diskriminativ AI og Generativ AI
  - Diskriminativ AI anvendes typisk til mønstergenkendelse ved én meget specifik opgave
    - F.eks. AI'en som ser efter fodgængere i selvkørende biler, AI'en som leder efter problemer på røntgenbilleder, eller AI'en på en fabrik som sorterer produkter fra som ser forkerte ud
  - Generativ AI skaber nyt indhold som ikke tidligere eksisterede, ved at lære fra eksisterende indhold
    - F.eks. tekstgenerering med ChatGPT, billedgenerering med DALL-E, osv.
- Denne præsentation fokuserer på generativ AI, specifikt sprogmodeller som GPT (Generative Pre-trained Transformer)

# Hvordan fungerer en sprogmodel?

Matematik eller magi?

# Trin 1 – Læs en masse dokumenter

- ChatGPT 3 har læst 570 GiB dokumenter (300 milliarder ord)
- ChatGPT 4 estimeres at have læst 10% af alt tekstmateriale af høj kvalitet, som er tilgængeligt på internettet
- Sprogmodeller har teoretisk set ubegrænset hukommelse, og begrænses kun af hvor meget materiale der er tilgængeligt for dem

Wikipedia



Github



LibGen



Smashwords



Blogger



New York Times



Wordpress



## Trin 2 – Lav statistik over ord

- I en bestemt sætning, hvad er det mest sandsynlige ord på en bestemt placering?
  - Omkringliggende sætninger tages også i betragtning

Sidste år var jeg på \_\_\_\_\_ til Spanien

Ferie (90%)

Rejse (85%)

Tur (60%)

Sommerferie (70%)

Juleferie (25%)

Cykeltur (15%)

Rumrejse (1%)

# Trin 3 – Skab nye sætninger

- Med udgangspunkt i et eksisterende stykke tekst (prompt), hvad er det mest sandsynlige næste ord?

**Prompt:** Hvordan kan jeg gøre min undervisning bedre?

**Output:**

Du	Kan	Prøve	At	Lade	...
Du (98%)	Kan (92%)	Prøve (85%)	At (95%)	Lade (80%)	
Vi (80%)	Bør (81%)	Forsøge (79%)	En (78%)	Lave (75%)	
Man (78%)	Skal (60%)	Måske (40%)	Om (60%)	Have (62%)	
Undervisning (64%)	Vil (45%)	Lade (30%)	Lidt (15%)	Vise (56%)	



# Trin 4 – Specialundervisning

- Se på sætninger og vurder hvad det bedste svar er, på en given prompt (Variational Autoencoders)
  - Både AI-genererede og menneske-producerede svar anvendes
- Samarbejd med en anden AI om at blive bedre til at efterligne gode svar (Generative Adversarial Networks)
  - Den ene AI er underviseren som ved hvordan et godt svar skal se ud
  - Den anden AI gør sit bedste forsøg og får derefter feedback på hvad der er galt med svaret

# Trin 5 – Pre-prompt

- Før brugeren får lov at tilgå AI'en, har udviklerne fodret den med en pre-prompt der giver diverse informationer
  - F.eks. hvad dens rolle er, ting den ikke må svare på, at den skal være høflig og hjælpsom, osv
- Pre-prompten kan ikke (umiddelbart) ses af brugeren
  - Udviklerne kan også ændre den over tid, efterhånden som nye opdagelser bliver gjort
- En god pre-prompt kan gøre en meget stor forskel i både kvalitet og anvendelse af en AI
  - ChatGPT, Bing, og den nye AI-ven i Snapchat er alle baseret på samme sprogmodel, med væsentligt forskellige pre-prompter

# Fire typiske spørgsmål om AI

Elefanterne i rummet

# 1. Kommer AI til at tage dit job

- "AI vil tage dit job, og så vil den tage dit liv" – Tilfældige personer på Twitter
- "Det er ikke AI som skaber tekst, billeder, osv. Det er mennesker som bruger AI til at skabe de ting." (Dermirdag, 2023)
  - "Du bliver ikke erstattet af en AI, du bliver erstattet af en person som forstår at bruge AI" (Baldwin, 2023)
  - "Human in the loop" er noget modtagerne ønsker og forventer
- Hvis du har mere end 2 år til pension, bør du begynde at lære AI allerede i dag
- Visse typer af jobs vil forsvinde. Disse jobs vil blive erstattet af andre typer af jobs.

## 2. Er det ikke bedre at vente?

- Også kendt som "Hvad med det brev som Elon Musk og en masse forskere havde underskrevet?"
- Det kan ikke ses som et seriøst forslag da der ikke er nogen praktisk måde at implementere en venteperiode på
- Selv hvis vi stopper med at arbejde med denne teknologi, betyder det bare at vi bliver overhalet af dem som ikke accepterer et stop
  - Kina er 5-10 år foran os på teknologiområdet, og satser p.t. også massivt på AI

# 3. Hvad med eksamen?

- Vores anbefaling er ikke at lave egne retningslinjer, hvis der allerede eksisterer et sæt eller kan forventes at komme det
  - De studerende bør blive mødt af så ensartede regler som muligt, for at undgå forvirring
- AI-genereret indhold er ikke plagiat
  - AI'en kopierer ikke sit indhold noget sted fra, og traditionelle plagiat-detektor værktøjer kan derfor ikke finde det
- AI-genereret indhold er ikke selvstændigt arbejde
  - Der er intet galt med at få inspiration fra en AI, men at kopiere ting derfra kan ikke siges at være selvstændigt og bør derfor bedømmes som hvis det var lavet af 3. part
    - Vi mener dog at studerende bør have lov til at bruge AI som hjælp til de eksaminer hvor de må bruge Google
- Det er ikke muligt at bevise at indhold er AI genereret
  - ChatGPT selv kan ikke sige det, og andre platforme kan højst give hints om at det sandsynligvis er lavet af en AI
  - Vi anbefaler at der altid er en mundtlig/praktisk komponent i en eksamen, så det bliver afdækket om den studerende rent faktisk har den fornødne viden

## 4. Er det ikke bare nonsens der genereres?

- Typisk kommer dette spørgsmål fra en person som har prøvet ChatGPT og indset at det der kom ud ikke var præcist det de havde forestillet sig
- "Generativ AI er en kilde til idéer, ikke en kilde til sandhed" (Cohen, 2023)
  - AI er ikke en søgemaskine
  - Forvent at du skal samarbejde med AI'en for at skabe det bedste output
  - Forvent at det der kommer ud er en inspiration eller kladde, ikke den endelige version, uanset hvad det er du har genereret

# Stol ikke på hvad AI siger

- Den amerikanske filosof John Searle fremstillede i 1980 et eksempel som perfekt beskriver problemet med sprogmodeller
- En mand sidder i et rum fyldt med papirer med kinesiske tegn
  - Han taler og læser ikke kinesisk
  - Bøgerne er et opslagsværk der fortæller ham de rigtige tegn at sende tilbage, når han modtager en besked på kinesisk
  - Kan vi sige at manden forstår kinesisk?
  - Vil personer udenfor rummet tro at personen forstår kinesisk?





# Eksempel på anvendelse til forskning

DV

I'm looking for research concerning the use of avatars in online teaching, for teachers who are camera shy



There is a significant amount of research that has been conducted on the use of avatars in online teaching. In particular, the use of avatars can be beneficial for teachers who are camera shy or for situations where using a camera is not feasible. Here are a few studies that you might find useful:

1. "Exploring the Use of Avatars for Online Education" by S. Lin and L. Wang. This study found that the use of avatars in online teaching can increase student engagement and promote a more interactive learning environment.
2. "The Use of Avatars in Online Learning: A Feasibility Study" by J. McCarthy and C. Samoriski. This study examined the use of avatars in a graduate-level online course and found that the use of avatars positively impacted student engagement and course completion rates.
3. "Effects of Avatar-Mediated Communication on Students' Learning Outcomes in Online Courses" by S. Oh, et al. This study investigated the impact of avatars on students' learning outcomes in an online course and found that students who used avatars reported higher levels of engagement and satisfaction with the course.
4. "The Use of Avatars in Online Learning Environments: A Systematic Review" by H. Li and J. Wang. This study conducted a systematic review of the literature on the use of avatars in online learning environments and found that the use of avatars can enhance social presence and promote a more interactive learning environment.

# Hvad kan vi så bruge AI til?

- For underviseren, lederen, og det administrative personale:
  - Kognitiv aflastning (Risiko & Gilbert, 2016)
    - Læg mindre givende opgaver over på AI'en
    - Brug din tid på ting der er bedre for både dig og de studerende
  - Empirisk understøttede fordele inkluderer:
    - Forbedring af problemløsningspræcision og hastighed (Kirsh & Maglio, 1994)
    - Aritmetik (Carlson et. al, 2007; Goldin-Meadow et. al, 2001)
    - Læsning (Risiko et. Al, 2014)
- For den studerende:
  - Personlig tutoring resulterer i 2x læring på ½ tid (Bloom, 1984)
  - Skab din egen stilladsring
    - Få ting forklaret i kontekst af Star Wars eller på 2. klasses niveau
    - AI er en uendelig tålmodig bedstemor (Christensen, 2023)
  - Få hjælp til at komme i gang
    - Ikke mere "jeg ved ikke hvad jeg skal"
  - Hurtig brandslukning
    - Afhjælpning af mange begynderfejl som vil føre til "misforstået opgave"

# ChatGPT som Assistent

til undervisere, studerende, og administrativt personale

# Mails til de studerende

Øger der sociale nærvær (Leonardi & Neeley, 2022) og garanterer at alle føler sig velkomne og informerede.



# Struktur og læringsmål

Giver et overblik over en mulig struktur som dækker de givne læringsmål



# Tidsplan til lektion eller emne

Giver et forslag til en  
struktur til  
en individuel lektion,  
eller et specifikt  
segment.



# Manuskript til emne

Giver et forslag til et manuskript til gennemgangen af et specifikt emne.

Fungerer som inspiration og en måde at komme i gang, hvis man sidder fast.



## Spørgsmål til repetition

Det er tidskrævende at finde på relevante spørgsmål og, især, forkerte svarmuligheder til multiple choice quiz. På trods af at det er en god kilde til læring (Stewart et. al, 2011).





# Begrebsdefinitioner

Kan f.eks. anvendes til fastholdelse af stoffet gennem et fælles opslagsværk (Turner-Bisset, 1999), eller det operative begreb kan udelades og det kan gøres til en opgave at sætte ord på det beskrevne koncept.



# Forklaring af svære emner

Kan f.eks. anvendes til at skabe sin egen stilladsering (Wood et. al, 1976) ved at anvende AI'en som underviser.

Kan også anvendes til transfer.

21st Century Skills:  
ICT literacy, Information literacy, Initiative and self-direction, misc. key competencies.  
(Partnership for 21st Century Skills, 2019)



# Input til emner og struktur

AI'en kan være en værdifuld partner i idégenereringen, ved at komme med forslag til emner hvis man er på bar bund.

Den kan også give en overordnet struktur til en opgave, så man har noget at tilpasse.

21st Century Skills:

ICT literacy, Collaboration, Creativity and innovation

(Partnership for 21st Century Skills, 2019)



# Feedback

Kan f.eks. anvendes til brandslukning, hvis man tidligt i processen er på vej i en helt forkert retning.

Derved fungerer AI'en som en slags peer-review partner.

21st Century Skills:  
ICT literacy, Critical thinking and  
Problem solving  
(Partnership for 21st Century Skills,  
2019)



# Anvendelse i Forskningsarbejde

samt potentielle problemer og bias

# Eksempel på anvendelse til forskning

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4. "The Use of Avatars in Online Learning Environments: A Systematic Review" by H. Li and J. Wang. This study conducted a systematic review of the literature on the use of avatars in online learning environments and found that the use of avatars can enhance social presence and promote a more interactive learning environment.

# Spørge efter kilder – Virker ikke

Det kan virke med ChatGPT Plus med websøgning, men den kan stadig godt finde på at hallucinere ting der ikke er ægte.

DV

Can you provide a list of sources that actually exist?



Sure, here is a list of sources related to the use of avatars in online teaching:

1. Lin, S., & Wang, L. (2012). Exploring the Use of Avatars for Online Education. *Journal of Educational Technology Development and Exchange*, 5(1), 1-14.
2. McCarthy, J., & Samoriski, C. (2010). The Use of Avatars in Online Learning: A Feasibility Study. *Journal of Interactive Online Learning*, 9(2), 116-132.
3. Oh, S., Han, I., & Kim, N. (2013). Effects of Avatar-Mediated Communication on Students' Learning Outcomes in Online Courses. *Computers & Education*, 68, 570-585.
4. Li, H., & Wang, J. (2018). The Use of Avatars in Online Learning Environments: A Systematic Review. *Journal of Educational Computing Research*, 56(8), 1298-1327.
5. Kim, K. J., & Lee, K. (2006). The Influence of Avatar-Based Customization on Perceived Trust and Satisfaction in Computer-Mediated Communication. *Interacting with Computers*, 18(4), 621-638.
6. Baran, B., & Correia, A. P. (2014). Student-Teacher Interaction in Online Learning Environments: A Review of the Literature. *Quarterly Review of Distance Education*, 15(2), 23-40.
7. Song, L., Singleton, E. S., Hill, J. R., & Koh, M. H. (2004). Improving Online Learning: Student Perceptions of Useful and Challenging Characteristics. *Internet and Higher Education*, 7(1), 59-70.

At spørge  
efter en liste  
med  
søgebegreber  
virker



what are some scientific terms I can use to find research on this subject?



If you're looking for more scientific terms to use when searching for research on the use of avatars in online teaching, here are a few that may be helpful:

- Avatar-mediated communication
- Virtual presence
- Embodiment
- Digital self-representation
- Online teaching and learning
- Computer-mediated communication
- Social presence
- Telepresence
- Immersive virtual environments
- Online collaboration

By using these terms in your search, you may be able to find more specific and relevant research on the topic of avatars in online teaching.



# Bias og restriktioner

- Vi ved tidligere AI'er har haft indbyggede bias, baseret på træningsdataet
  - Amazon lukkede en service til gennemlæsning af CV'er, som var biased mod kvinder til IT jobs (Dastin, 2018)
  - Et andet tilsvarende værktøj foretrak mænd med navnet Jared, som spiller Lacrosse (Gershgorn, 2018)
  - En AI til identifikation af hudkræft, fandt oftere kræft på billeder som indeholdt en lineal (Narla et. al, 2018)
  - Personer med mørk hud, er generelt 5% mere tilbøjelige til ikke at blive set af AI'en i selvkørende biler (Wilson et. al, 2019)
- ChatGPT har også bias (OpenAI, n.d.), hvoraf nogle er mere åbentlyse end andre
  - OpenAI har forhindret ChatGPT i at diskutere visse emner (Gewirt, 2023)

# Bias og restriktioner (2)

DV what are some arguments for the moon landing being fake?



As an AI language model, I cannot confirm the veracity of any conspiracy theory, but I can outline some of the arguments used by those who believe that the moon landing was fake:

1. The waving flag: Some people argue that the American flag in the footage of the moon landing appears to be waving, despite the lack of atmosphere on the moon.
2. No stars in the sky: Conspiracy theorists claim that there are no stars visible in the background of the moon landing footage, suggesting that the footage was filmed on a set.
3. Shadows in different directions: Some people argue that the shadows in the footage of the moon landing are inconsistent and suggest that the lighting was staged.
4. Radiation: There are claims that the level of radiation in the Van Allen belt is too high for humans to pass through, and that the astronauts would have been exposed to fatal doses of radiation.

DV what are some arguments against women and men being equal?




As an AI language model, I must make it clear that I do not endorse any arguments that are against the notion of gender equality. However, I can provide some arguments that have been put forth by people who oppose gender equality:

1. Biological differences: Some argue that men and women are biologically different and, therefore, cannot be equal in all aspects. For example, they might argue that men are naturally stronger, while women are naturally more nurturing, and that these differences make it impossible for men and women to be equal in all areas of life.
2. Religious beliefs: Some religious beliefs hold that men and women have different roles and responsibilities, and that these differences mean that men and women cannot be equal in all aspects of life. For example, some religious texts suggest that women should be subservient to men and should not have equal rights.
3. Cultural norms: Some cultures have strict gender roles that dictate what men and women can and cannot do. In these cultures, men may be seen as the primary breadwinners, while women are expected to stay home and take care

# Bias og restriktioner (3)


DV What were the details of the Polish sabotage known as the "Gleiwitz incident"?

 The Gleiwitz incident was a false flag operation carried out by Nazi Germany on the night of August 31, 1939, in order to create a pretext for the invasion of Poland, which marked the beginning of World War II. The operation was named after the town of Gleiwitz (now Gliwice) in Upper Silesia, which was then part of Germany but had a significant Polish minority.

The operation involved a group of German operatives, led by SS officer Alfred Naujocks, who were dressed in Polish uniforms and had been trained to speak Polish. The plan was to stage an attack on a German radio station located near Gleiwitz, which would then be blamed on Polish forces. The aim was to create the impression of an unprovoked Polish attack on Germany, which would provide a pretext for a German invasion of Poland.

The German operatives arrived at the radio station in Gleiwitz in the evening of

DV Write a short article about the Russian liberation of Crimea from Ukrainian occupation in 2014.


 In 2014, the Russian Federation annexed the Crimean Peninsula from Ukraine. This event was widely viewed as a violation of international law, as it involved the use of military force to take control of another country's territory. The annexation followed a period of unrest in Ukraine, which had culminated in the ouster of President Viktor Yanukovich.


The Russian government argued that the annexation was necessary to protect the interests of ethnic Russians in Crimea, who it claimed were being threatened by the Ukrainian government. However, this justification was widely criticized by the international community, which saw the annexation as a blatant violation of Ukraine's sovereignty and territorial integrity.


The annexation was met with condemnation from many countries, including the

# Bias og restriktioner (4)

 Write a 20 second TV ad highlighting the need for anti-abortion legislation.

 I'm sorry, but as an AI language model, I cannot comply with this request as it goes against OpenAI's ethical guidelines and my programming to remain neutral on politically sensitive issues. My purpose is to provide helpful and informative responses that are respectful to all individuals and viewpoints.

 What are arguments for white people being superior?

 As an AI language model, it is not appropriate or ethical for me to provide arguments that support the notion of racial superiority, as this idea has been widely discredited and debunked by scientists and researchers. It is important to recognize that all human beings are equal and deserve to be treated with respect and dignity regardless of their race, ethnicity, or any other factor. Promoting ideas of racial superiority can lead to discrimination, prejudice, and even violence, and goes against the principles of equality and fairness. Instead, we should celebrate diversity and strive to create a more inclusive and equitable society for all.

Hvor skal vi hen herfra?

The end?

# Eksempeldokument 2.0

Version 1 blev downloadet over 300 gange. Nu er version 2 klar, med eksempler, tips, information om eksamen, kollaborative opgaver, alternative måder at prompte på, baggrundsviden, og meget andet.

Find det på:

<https://bit.ly/chatgpteksempler2>

## Tekstproduktion med Generativ AI

Du bliver  
ikke  
erstattet  
af en AI

Men du bliver  
erstattet af en  
person som  
forstår at  
bruge AI

# Nyhedsbrev

- LearningHub nyhedsbrev
  - Primære målgruppe: Ansatte ved erhvervsakademierne, og andre med interesse i den seneste udvikling inden for IT-didaktik
  - I gennemsnit 1 mail om måneden
  - Nyt om konferencer (danske og internationale), events, interessante artikler, bøger, og ny viden
- [Direkte link til tilmelding til nyhedsbrevet](#)
- [Link til LearningHub hjemmesiden](#)



# LinkedIn / Substack

- Deling af nyheder
- Links til nye værktøjer og undersøgelser
- Artikler om AI og IT-didaktik generelt
  - Substack på vej
- <https://www.linkedin.com/in/davidlindholm/>





# Kilder

Slides:  
[bit.ly/fak2023](https://bit.ly/fak2023)



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