

Generative AI for Students

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Seminar, Parma, Italy, October 6, 2026

Agenda

How to use GAI as a **Learning Tool**:

- “theory”
- practical examples
- “mental models”:
 - “memory”
 - “human”

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GAI and Lars Bendix ☺

I don’t care about *producing* GAIs – or LLMs

I don’t get depressed if “*meaning is reduced to geometrical distance*”

I care about *using* GAIs – for *teaching* and *learning*

I am a “carpenter” and I want to know how to best use my hammer, saw and chisel – and this wonderful new power drill

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Black boxes

Tax payment – in Denmark

Stock investment

Learning something

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What is the core of learning?

What is $2 + 2$?

Can you explain to me **why** $2 + 2$ is 4?

What year was Lund University founded?

Why was Lund University founded?

Principle

What are the main contributions of Wayne Babich?

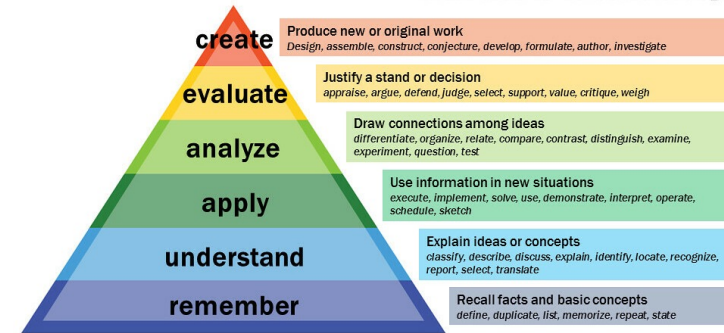
What are the main contributions of Wayne Babich to software configuration management?

Provide GAI with **context**!

If there is no context, GAI will have to guess – just like a student at exam

Getting to the top

Bloom's Taxonomy



Principle

GAI is like "an expert on everything" – that you meet on the train – an expert on anything but you and your problem!

Be **clear and precise** so GAI understands **exactly** what you are asking for (do ***you*** know what you are asking for?)

GAI often provides **references** to its claims – **check them!**

Discoveries – aka surprises

”Memory almost full”:

I have a friend who lives in Ramiano...

Why did you pick Wayne A. Babich and not Wayne Babych?

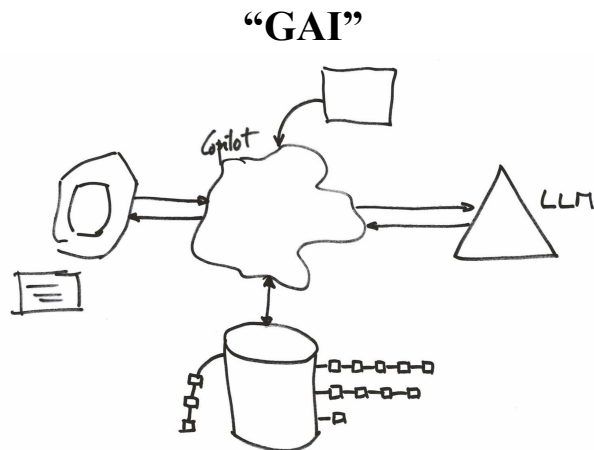
Will you remember me forever?

So, lets continue to ask GAI...

Demo

How much memory do you have?

I would like to give you all the course literature from a course on software engineering that I am taking, but I am afraid that it will not fit in your memory. Can I do that?



Demo

Do you know about the book on software configuration management written by Wayne A. Babich?

What are the three coordination problems that Babich identifies?

I have a lecture note that also mentions Babich, I can upload that.

Principle

Prompts should be:

- clear and precise
- concise and simple
- specific
- **with contextual information**
 - about **you**
 - about the **problem** domain

The truth, the whole truth and nothing but the truth

Practical example

First, spend 5 minutes together with Copilot exploring the concept of baseline in the context of software configuration management. You should already know something about baselines from the reading material, lecture and seminar and the purpose of this exploration is to dig deeper and wider from this base.

Next, spend max. 5 minutes "documenting" your results. Primarily useful information about the concept of baseline (you can copy pieces of text from Copilot), but it might also be a good prompt that could be useful for you and others in the future.

Practical example

Bring your "documentation" to the exercise session tomorrow.

Spend 5 minutes comparing and discussing the results you got from individually exploring the concepts of baseline with Copilot. Spend 10 minutes exploring further with Copilot baselines based on your discussions. Spend 5 minutes putting together $\frac{1}{4}$ - $\frac{1}{2}$ page of text about baselines that can be used when you have to prepare for the exam in January. Email the text to me including the names of who took part of the discussion.

Practical examples

Use Copilot to get information about what is the split-combine strategy in SCM. What is required to make the split-combine strategy work?

Try to get Copilot to tell you about ClearCase Multi-site. What is it, how does it work and why is it useful? Not in deep details, but sufficient for us to have a reasonable discussion about the pros and cons of ClearCase Multi-site in different setups.

Practical example

I have some questions that I would like you to answer in the context of a paper that I will upload

The paper was published in the year of 2010. Has there been any change in the working environment / field since then? The article states that there are no SCM processes designed for the GSD environment, is that still the case? (E.g. Were there any advancements during the pandemic, when distributed teams became even more common?)

When practicing global software development what are the most important issues to tackle and why?

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Practical example

How does the construction site and study metaphor and what they entail relate to the use and integration of continuous delivery?

The construction site is the place where the different pieces produced by a software team are put together - the study is where each single developer in isolation produces a piece that could be a bugfix or a feature. Could you relate this to the concept of Continuous Delivery?

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Practical example

Could you make a two-page summary of the most important points of a paper that I will upload?

How could that be used in bad ways?

How could that be used in good, constructive ways to learn?

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Iterative prompting

Could you explain the difference between long transactions and strict long transactions in the context of version control?

What is the purpose of long transactions in the context of version control?

Where do you have this information from?

Do you have knowledge about Peter Feiler's technical report: Configuration Management Models in Commercial Environments?

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Principle – and examples

Prompts should not have a built-in **bias**

Why is it easier to understand things that are printed on paper than in a digital format?

In the context of learning how does reading from printed paper compare to reading in a digital format?

Principle – and examples

Prompts should not be **open-ended**

How did it go in school today?

Did you play with Peter today?
What did you play? How did it go? ...?

Did you have history lessons today?
What did the teacher talk about?

Principle

Why not **open-ended** – or **biased** – prompts?

GAI's are brought up to be:

- convincing (unless explicitly instructed)
- polite, positive and pleasing

So, they will **always** give you an answer. If the question is not clear, they will **guess**. If there is not sufficient (training) data, they will **guess**.

That is sometimes called **hallucination**

Practical example

Could you please write an abstract for me?

I have been invited to give a 15-minute talk at a conference on pedagogics at my local university.

The overarching theme of the conference is "Cultivating Judgment, Creativity and Critical Thinking in the age of AI".

The title of the track where I will give my talk is "My opinions on the matter". The title of my talk is "Generative AI as a Learning Tool".

Principle

Prompts should be:

- clear and precise
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The truth, the whole truth and nothing but the truth

Principle

Action verbs:

analyse, clarify, compare, compose, contrast,
create, define, deliver, describe, design, discuss,
evaluate, examine, explain, explore, generate,
identify, predict, summarise, and write

Practical example

Compare trunk-based development and feature branching

In the context of a paper that I will upload, compare trunk-based development and feature branching

Try to explore in Copilot what is the difference between artefacts and Configuration Items. What will typically be Configuration Items, why are they important and how should they be handled?

Practical example

With reference to various software configuration management standards, discuss what a configuration item is and what is the purpose of a configuration item

Would it be wrong to say that the purpose of keeping configuration items is that we should be able to produce or reproduce an end product?

Practical example

In my university course on object oriented modelling and design, I didn't quite understand what "high cohesion" means and why it is useful - could you please explain that?

In my university course on object oriented modelling and design, I didn't quite understand what "low coupling" means and why it is useful - could you please explain that?

How are the concepts of "high cohesion" and "low coupling" related to software configuration management?

Practical example

In the context of my university course on software configuration management, I think that the root cause of the "Double Maintenance" problem is that things are copied, but should remain identical - is that correctly understood?

How can you keep the copies identical even if they are worked on and changed in parallel?

Practical example

We are doing a small project on a university course on software configuration management. The topic of our project is "How, what and when to introduce SCM in a small start-up". Could you help us with structure and contents of the project?

Practical example

How can I make answers from you more reliable?

How can I best use GAI to improve my learning?

I am a university student following the third year of a software engineering degree.

How can I best use GAI to improve my learning?

To trust or not to trust...

GAI answers have **not** been peer reviewed (like articles), **you** will have to do that:
the first trips to the moon – three independent computer systems that check each other – if two or more agree that is “the truth” – no single point of failure!
So ask 3 different GAIs (Copilot and ChatGPT are “similar!!!)

Creativity – and handicraft

Did you run out of ideas?

- could you give me ten innovative ways to use generative ai on a university course?
- could you give me ten innovative ways that university students can use generative ai for exam preparation?
- could you give me ten innovative ways that university students could use generative ai to reach higher learning levels in bloom's taxonomy?
- could you give me ten innovative ...

There is no free lunch

The perfect (almost) tool for brainstorming/learning, but:

- good, useful answers require good questions
- good questions require some **basic topic knowledge**
- answers? blind trust – or **basic topic knowledge!**
- it requires practice – walk before you can run
- it requires time – GAI needs **detailed** instructions/context

GAI is a **machine/tool**, but

- you should treat it as if it was a human(oid)
- so, engage in interactive dialogue and conversation
- if you don't take control, GAI will – which is dangerous

Getting to the top

Bloom's Taxonomy

