

LLM as a Learning Buddy:

Rethinking LLM in an Educational Context

Toru Ishida

Visiting Professor, Telkom University
Professor Emeritus, Kyoto University

LLM Use in Education

When we are trying to learn new knowledge, we need a method that **fully leverages the potential of LLMs**.

In this seminar, we introduce **four key principles** for engaging with LLMs in a way that enhances learning.

- Let Yourself **Learn from LLM**
(Don't try to “use” it)
- Ask **Simple Questions** and Keep the Conversation Going
(No Need for Prompt Engineering)
- Enjoy Exploring **Beyond the Topic**
(LLM is not a Google search)

WEEK 1

-
- Respect LLM as Your Lifelong Mentor
(Like Kongming in *Ya Boy Kongming*)

WEEK 2

Let Yourself Learn from LLM

(Don't try to “use” it)

Human: hey, i wanna talk about the future of **blockchain technology**. in my opinion, blockchain will act the same way as internet back in the 90s with it's wide range of application to all kind of human field.

what about yours opinion of it?

LLM: I also see blockchain as something similar to the internet in the 90s: right now, it's **undervalued** by the general public, but **overhyped** in certain circles, just like early web technologies were.

Over time, **blockchain will likely fade into the background** as an infrastructure layer — not always visible to users, but critical for many systems.

According to this student, they hadn't heard blockchain being described as overhyped.

Human knowledge is biased by our environment. Even though LLMs knowledge is biases by their learning data, LLMs can help us objectively check our knowledge.

Let Yourself Learn from LLM (Don't try to “use” it)

The topic is about dreams, I chose it because it's quite interesting to learn the facts from various theories by the discoverers.

Human: but you surely know that when someone shares their personal experience, they sometimes feel like they're **falling from a height** when **they wake up**

LLM: Yes, I know that experience very well — and it turns out it's very common! Many people have experienced a sensation like "falling" when they are **about to sleep or just starting to dream**. In fact, it even has a specific term: Its scientific name: **Hypnic Jerk** (or sleep start).

The reason I quoted the above part is because I'm sure everyone has felt it.

This student experiences a falling sensation upon waking, but the LLM writes about the falling sensation when falling asleep.

This is a nice curiosity-based discussion. But be careful, LLMs can answer without truly understanding the logic.

Let Yourself Learn from LLM (Don't try to “use” it)

Human: Hey, I'm curious. Do you know about the **Jabulani ball** from the 2010 World Cup? They say that ball has different characteristics compared to other balls, and some researchers have even studied its mechanism.

LLM: Of course! The Jabulani ball used in the 2010 FIFA World Cup is quite special—and also controversial. Many players, especially goalkeepers, criticized the ball during the tournament. Famous players like Iker Casillas and Gianluigi Buffon called it **too unpredictable**. Some scientists even studied it in wind tunnels to understand its unusual flight behavior!

Human: Someone said that the ball is full of controversy. What's wrong with that ball, and why?

This student is curious about the controversial official ball used in the World Cup in South Africa.

This topic would be interesting for anyone who loves soccer. This official ball should have been perfect, yet it hasn't been used since. It would be interesting to analyze it from a physics perspective.

Ask Simple Questions and Keep the Conversation Going (No Need for Prompt Engineering)

Human: How will **AI change the future of education** in the next 10 years?

LLM: In the next 10 years, AI will transform education by making learning highly personalized, adapting to each student's individual needs and pace. It will automate administrative tasks for teachers, allowing them to focus more on mentoring and creative teaching. AI will also expand global access to education, especially through online learning platforms.

Human: That's interesting! Will there be any **negative impacts** of using AI in education?

LLM: Yes, there could be negative impacts. Overreliance on AI might reduce students' critical thinking and problem-solving skills if they become too dependent on automated help.

This student asked how AI might change education, and after hearing the response, followed up with a question about the potential downsides of AI in education.

It's a very natural and inquisitive conversation. The ability to come up with new questions based on an LLM's answers is a vital quality for any learner.

Ask Simple Questions and Keep the Conversation Going (No Need for Prompt Engineering)

Human: **If AI can already do programming, why should I study Informatics?**

LLM: "Although AI can perform many technical tasks, the human role in informatics remains crucial for understanding context, building long-term visions, and ensuring that technology aligns with ethical values and societal needs. AI is a tool, and humans remain the main directors."

Human: **But I believe AI will evolve to the point where it can solve high-level programming problems. Doesn't that mean I don't need to study Informatics?**

LLM: **"As AI evolves** to solve high-level problems, new challenges will emerge. Studying informatics is not just about mastering current tools, but about understanding computational thinking and solving new problems that don't even exist yet.

The student tries to delegate computer engineering tasks to the LLM, but the LLM responds by saying that there are still things humans need to do.

It's a very interesting conversation. This is the kind of question that might be hard to ask a human professor, but with an LLM, you can ask anything without hesitation. That's why LLMs can be great personal tutors.

Ask Simple Questions and Keep the Conversation Going (No Need for Prompt Engineering)

Human: do you think ai can in sometime in the future be aware of the context of that phrase (blues in e flat... one, two, three, four...) and for example **respond accordingly and in a tasteful way to other musician's improvisations?**

LLM: Yes — very likely. But tastefulness is tricky.

Human: shouldn't ai simply fail **the turing test?** i mean, the infrastructure for ai is already very complex and inefficient, so i thought who will build equivalents of like nuclear power plants so robots can jam with humans?

LLM: **Should AI fail the Turing Test? Maybe yes** — maybe there are parts of human culture (like live music-making) where it's actually better if AI can't perfectly **imitate us**.

This student asked whether AI will be better than humans at improvising music. The LLM responded humbly, but the student felt a sense of fear when it ended by saying “imitate us,” as if it were human.

Modern LLMs are trained to avoid making people uncomfortable, so they tend to be very humble. However, since the texts they learn from are written by humans, they sometimes respond as if they were human.

Ask Simple Questions and Keep the Conversation Going (No Need for Prompt Engineering)

When asked about **Edge AI**, ChatGPT give a very long and detailed explanation and it is harder to understand the main point of it.

Human: Can you explain it in **50 words**?

LLM: Edge AI works by using small, optimized models that run directly on devices like sensors or smartphones. These models are compressed and trained for specific tasks, needing much less memory and power. Specialized chips accelerate AI tasks, making real-time processing fast, private, and efficient without relying heavily on cloud computing.

Surprisingly the short explanation generated is **exactly 50 words**.

This student tried telling the LLM, as discussed in the previous seminar, to “give a short answer.”

The instruction “Answer in 50 words” falls more under the category of prompt engineering, but it can also be effective in conversations with an LLM. Since LLMs tend to be talkative, their responses are often very long.

Enjoy Exploring Beyond the Topic (LLM is **not** a Google search)

Human: **hei, im** curious about computer quantum can you explain, what is that?

LLM: Of course! **Quantum computing** is a type of computing that uses the principles of quantum mechanics. In regular computers, information is stored as bits, which can either be a 0 or a 1. But in a quantum computer, information is stored as qubits (quantum bits). Qubits are special because they can be 0, 1, or both at the same time....

Human: Are the security of **cryptocurrencies**, also known as blockchain technology, can be easily breached by quantum computers?

LLM: You're right! Most blockchains (like Bitcoin, Ethereum, etc.) rely heavily on cryptography to stay secure. But quantum computers are different....

This student was asking about quantum computing, but the discussion eventually shifted toward the security of cryptocurrencies.

Quantum computing can lead to a wide range of topics. Its applications are not limited to finance, but also include drug discovery, logistics, and more.

Enjoy Exploring Beyond the Topic (LLM is **not** a Google search)

Human: If we lived in a fictional world and **could have one superpower**, what superpower would you choose and what would you use it for???

LLM: Wow, that's cool! If I could choose, I'd want the power of **teleportation** — like being able to go anywhere in an instant.

Human: If we had superpowers, would we have to become a **superhero**? What if we became a **villain** instead?

LLM: Regarding having superpowers, I personally feel you **don't have to be a superhero**. Power is just a tool — whether it's good or evil depends on the user's intentions.

This student first asked the LLM what superpower it would want in a fictional world. They then had a lively chat about becoming a villain.

This is the kind of subject you could talk with an LLM all night.

Lessons Learned from Experiences with LLMs

In the end, the most important skill for learning with LLMs is "*curiosity*."

Curiosity is a powerful desire to learn or know more about something. It's an inner drive to explore, ask questions, and seek understanding.

- For *breadth*: The desire to know about many different topics and explore various fields.
- For *depth*: The desire to fully understand something, including its details and core principles.

By the way, what is the purpose of university?

- To gain knowledge and skills?
- To learn *how* to gain knowledge and skills?
- Those matter—but above all, it's about nurturing *curiosity*.

University lasts four years, but the real world awaits for decades beyond. *With enduring curiosity and LLMs, learning never stops after graduation.*

Respect LLM as Your Lifelong Mentor (Like Kongming in *Ya Boy Kongming!*)

In *Ya Boy Kongming! (Paripi Kōmei)*, the brilliant military strategist from Romance of the **Three Kingdoms** guides young people facing modern-day challenges. For example, Eiko dreams of becoming a successful singer-songwriter but struggles to gain popularity despite her talent.

In response, **Kongming applies strategies from the *Battle of Red Cliffs***, using a tactic where free drink tickets are exchanged for social media shares, **effectively increasing Eiko's recognition**.



https://www.youtube.com/watch?v=cA_A0oK77wg&t=44s

The English dub of 'Ya Boy Kongming!' is available on Crunchyroll and HIDIVE.

Respect LLM as Your Lifelong Mentor (Like Kongming in *Ya Boy Kongming!*)

Indonesian youth struggle with the dilemma of **"family expectations vs. personal dreams."**

Gathering Information and Organizing Options

Understanding realistic income possibilities:

- "How can artists make a living in Indonesia?"
- "What are some success stories of freelancers and side businesses?"
- "How can one balance a creative career with financial stability?"

Researching real-life success stories:

- "Examples of successful artists and creators in Indonesia"
- "Differences in opportunities between the local and international markets"



Respect LLM as Your Lifelong Mentor (Like Kongming in *Ya Boy Kongming!*)

Knowledge for Strategic Negotiation

Preparing convincing explanations for parents:

- "How to logically explain to parents in a persuasive way"
- "Creating a concrete plan for earning a stable income"

Considering alternative approaches:

- "How to start with a stable job while gradually pursuing an art career"
- "Exploring new monetization opportunities like online businesses and NFTs"

Simulation and Advice

Simulating conversations with parents:

- "How can I explain it to my parents in a way they'll understand?"
- "How should I respond if they object?"
- "What is a practical approach to transitioning into an art career while maintaining financial stability?"

Of course, you can keep asking questions about anything you don't understand in the LLM's responses.
After all, the LLM is your personal mentor.



Respect LLM as Your Lifelong Mentor (Like Kongming in *Ya Boy Kongming!*)

There will be many challenges ahead:

- Job hunting
- Housing
- Working abroad
- Wedding and childcare

At such times, take your time to have **deep conversations** with LLMs *to gain knowledge*.

However, when ***making decisions***, **conversations with friends and family** are still important.

