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Future Libraries' AI Focusing on Motivations to Learn

A Technologist's View

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Introduction

Epistemic insight focuses on not just serving up topics to remember but contextualizing educational experiences around domains to look at problems. Here's how I explain it and relate to it:

I sadly can't easily remember facts without relating to the concepts that make them useful. For me to care, I find myself needing to see how the facts matter for understanding and solving problems in the world. Some learners stubbornly ask broad questions of teachers that might seem like they are derailing a teaching unit and the curriculum it is part of. It can be difficult for a teacher, as school curricula is often built from taxonomizing things to learn for a march towards mastery

in each context. Some topics are important, as we need alphabets to learn to read and cartesian coordinates to graph. Immersed in the topic of the moment, the learning of some facts becomes key.

As a child, I saw spelling as a convention that I didn't need to learn. But not knowing how to spell continues to be a problem because of its support of language and communication. People don't remember topics in isolation but in the context of what the knowledge can be used to do. But there is often a siloing of knowledge into classes and tests in disparate domains without explaining the conceptual connections. Seeing the big picture helps put them together. Furthering the ideas needs context approach to learning; the 'Epistemic Insight' movement was developed to help contextualize ways of thinking about knowledge. It starts by considering problems from multiple perspectives or domains. These domains are science, geography, history, theology, languages, literature, the arts, philosophy, engineering and maths. Each domain helps people see a question from a different perspective.

Indeed, such a base lets us communicate better with other people. It becomes a social construct, which after all is what communication is. Reasons for learning include both meaning and learning to be part of a knowledge culture.

Library transformed

A library is a place that catalogues all of knowledge and has librarians that might help us learn where it is and how to use it.

Why go to a library?

We go to libraries with our hunger for learning information and understanding. Our learning can be our effort to get knowledge for knowledge's sake. Our learning can be to get good at crossword puzzles. Our learning can be to answer other questions for ourselves and others too. Our learning might be a respite, reading about others or fantasy worlds to take us away from the reality of our lives

and troubles. Our learning might also be to try to learn to create understandings that we can use to solve new problems, in possibly creative ways. These examples of reasons to learn require different frames of reference and ways of thinking.

How do we engage with a library?

'What are you trying to do?', the reference librarian would ask me to decide what kinds of reference information to suggest. The way I construct search queries has developed. I can include search terms to guide what kind of information results the search engine gives me. The World Wide Web is the library of all things that people have put online.

A library has materials that are written for various readers. Some introduce a topic for children, some are for people with lots of other knowledge, and others for people that are experts. The step changes of search and now GenAI are bringing library activities to everyone all day long everywhere. GenAI accesses materials that have been put on the web as a library. It fields complex constrained questions the way a librarian might.

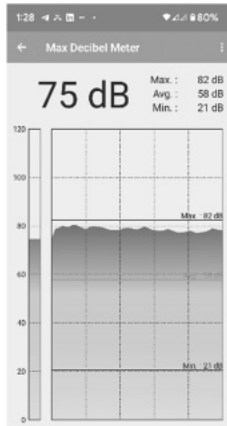
GenAI also responds with stories tuned to any way we describe how we like to absorb information. We might ask for it to respond with a long or concise answer, a list, a poem, in old English or maybe in Bengali . . .

GenAI's packing of the knowledge includes connecting stories between islands of things we have asked about. When being told to speak in Australian or Indian English, the GenAI system adjusts. GenAI, like people, coalesces ideas into more approachable stories. As any library search, exploration with the future library always starts by framing a problem, but now uses a combination of using Gen AI and also web content in generating and testing results. Ways of finding and refining our understanding of the world's knowledge are on our desk computer and mobile phone. They respond to questions, find information and present it to us at a level and in the language we can understand. They are primed to remember the interaction as they respond to critical evaluation statements and follow-up questions.

Library-like knowledge exploration happens everywhere

Library work has never just been done in libraries. While the new libraries might include quiet places with supportive librarians when we need help deepening or broadening our exploration, the new future library allows us to explore and learn wherever we take our smartphone.

Early scientists carried instruments to learn about things wherever they went. We do the same with our phones that can sense noise, light, level, heart rate, distance, altitude and more. It lets me illuminate, calculate, magnify, reflect as a mirror, convert units, tune to a note and more. When I am on a plane, for example, I can measure the altitude and noise level of the cabin with a phone app. We still have to ask the questions to learn; I can use these direct measurements as seen in the screengrab from my phone to drive GenAI or web queries.



In 2010, I was visiting NYC and within a block of where I wanted to be. I didn't think to check with my phone and asked a couple, 'Do you know where this street is?' One of the couple pulled out a smartphone to ask it to show us on a map. Their partner and I were impressed with their ability to consult the world's knowledge for local guidance. The smooth and productive communication of ideas works when we have a grounding.

I wouldn't have been able to appreciate the smartphone's map had I not been taught how to read a map. The Discipline Wheel could

be used with an app to guide us in a physical library to 'TA' the place where books on technology can be found. More likely an 'Epistemic Insight' app will be guiding us to various online library resources. In such cases, epistemic insight is here to remind us that we must learn across the domains to utilize knowledge. The new library can help orient and focus our knowledge exploration more easily and quicker than ever before.

We are just developing our use of these new tools and new knowledge resources. Search impacts how and what we do to learn and find things. We can be sad or nostalgic for the books on a big table in the library: the way we organized them with tabs, bookmarks, notes and references. Writing a multi-referenced piece, we would use the copier to take some of those references home or fill large backpacks with what we could check out. These multi-week excursions can now be done and documented in minutes with search engines.

Learning to use libraries

Libraries are always daunting; Why is it so quiet, large and vacant here? Where do I start? How do I use the card catalogue? The future online library might be everywhere, but it too needs introduction. We have to know how to ask questions, develop parts of ideas, winnow the direction, do follow-up searches and collect the information before writing. Our learning can help us know where to look (domains), how to relate things together (contextualizing domain knowledge), recognize what knowledge does and doesn't fit together (analysing relationships of knowledge across domains). Then there is the long arduous documenting all of this story with support for our analysis. And then along came generative AI (GenAI) to make assembling knowledge much more accessible.

Learning with GenAI

GenAI allows us to start with questions, name the domains that might be relevant, name the relationships that are being evaluated and the goal of the result. We can present these things explicitly

to get results in any form we like. It seems to skip the arduous documentation phase, but maybe it doesn't. First, we need a teacher to help us formulate questions and the librarian to help us know how to find what we are looking for. Then we need the teacher again to help us learn how to analyse the responses. We then need the librarian again to help us know what and why to look up supporting things, possibly aided by the Epistemic Insight Initiative's Discipline Wheel tool, helping us ask the question from different perspectives.

Let's take the example of having GenAI consider the question of cow dung.

Prompt

Please make a concise list of ways to look at cow dung relative to each of science, geography, history, theology, languages, literature, the arts, philosophy, engineering and maths.

ChatGPT

Certainly, here's a concise list of ways to look at cow dung relative to different fields:

1. Science: Analysing its chemical composition and microbial content.
2. Geography: Examining its geographical distribution and impact on land use.
3. History: Tracing its historical use in agriculture and cultural significance.
4. Theology: Understanding its role in religious rituals and symbolism.
5. Languages: Studying linguistic expressions and idioms related to cow dung.
6. Literature: Analysing its portrayal in literature and folklore.
7. The arts: Exploring its use in traditional art and performance art.

8. Philosophy: Discussing ethical and metaphorical aspects.
9. Engineering: Utilizing it for biogas production and waste management.
10. Maths: Applying statistics and modelling for agricultural and environmental purposes.

The above GenAI response is impressive but is it what we really wanted? At this point we might think we are done but it's time to make the result our own. We can use the list to prompt our writing, or we can ask it to expand the responses. The domains above are not sacrosanct. We might also follow up by asking about dung economics, dung as a way to learn about cow health, its use as fertilizer, its use as fuel, a building material, its impact on the environment and so on.

Below we follow up by asking about the philosophical issue of the metaphorical aspects alluded to above.

Prompt

Please make a concise list of ways to look at the metaphorical aspects of cow dung.

ChatGPT

Here are some concise metaphorical aspects of cow dung:

1. Growth and potential.
2. Humility and simplicity.
3. Transformation and renewal.
4. Natural resource utilization.
5. Life's challenges leading to growth.
6. Purity and purification.
7. Cultural and traditional values.
8. Utilitarianism and practicality.

We ask, consider and incorporate things that are appropriate into our knowledge and our work product.

I had a Research Assistant (RA) whose classmate turned in a result of something written by GenAI and got kicked out of class. My RA started from such a process but then looked up facts, put things in their own words, considered how the writing should fit the assignment better and continued to ask more questions. They got an A+.

There are so many new ways to use GenAI. For example, as a tutor, we can ask GenAI questions in every direction without embarrassment until we are satisfied. We prompt it with what knowledge and assumptions to start with, what style and viewpoint and length of response we want it to produce. We might want it to include images, video, graphs. All this is easy for GenAI. It can create its answer in almost any media form.

Asking GenAI to write about technology of a future library

Prompt

Make a 150-word statement about how generative AI and web content to be used to create the future library would help people learn from different domain perspectives. Describe how it could help in learning, research, preparing presentations, personal growth and entertainment explaining how human librarians and teachers might help guide people to use the library.

ChatGPT response

In the envisioned future library empowered by generative AI and web content, the role of human librarians and teachers would be indispensable in guiding individuals to make optimal use of this advanced resource.

Librarians would curate and oversee the AI-generated content, ensuring its accuracy and relevance, while teachers would collaborate with them to align educational materials with curricular needs. They

would collectively provide personalized guidance, teaching users how to navigate the library effectively, critically evaluate AI-generated information and enhance digital literacy skills.

Furthermore, human educators would fine-tune personalization algorithms to match individual learning preferences and goals. They'd offer ongoing support, answering questions, providing feedback and helping users maximize the utility of AI tools for tasks like research, presentations and data analysis.

Importantly, these experts would address ethical and privacy considerations, ensuring responsible AI use and adherence to ethical standards. In sum, human librarians and teachers would bridge the gap between users and AI, offering valuable insights, support and ethical guidance to ensure the future library becomes a powerful and responsible resource for learning and research.

In the above discussion, telling GenAI the goals of my query fills in knowledge and structure to help explain the topic. As in this chapter, its description of librarians requires development. The librarians of the future library will work at a higher and more interesting level. In this case, I hope my chapter is better than the above GenAI piece and brings in more perspectives, but I only gave it 150 words to work with. Even with this constraint and not much direction, GenAI produced an interesting answer.

A library is only as good as its books

We must take care with GenAI to know what it should and shouldn't be expected to explain well. We enable fantasy when we misremember what others said, but it's more delicate now with GenAI also responding in this way. The lazy lawyer that didn't check and let GenAI help them imagine a precedent that didn't exist lost his case. The scientist might hope someone wrote a justifying piece for an article and find GenAI making a story about such an article it has been encouraged to imagine. It is becoming more important than ever to check one's sources to establish truth. The new generative library requires us to focus on improving our critical, analytical and question-asking habits. The library needs people as well as online oracles to form solutions.

By reading things that have been written, GenAI learns what typically happens; it does not learn about the unusual 'black swans'. But we also want to explore topics that haven't been popular, are only partially known or are rare. We go to the library to learn about what we don't know. We must remind ourselves to expect today's GenAI to respond with aggregated commonly available vernacular information, not the incisive special case. We need guidance to learn how to find the unusual.

Librarians and library user have new and worthy roles

With future libraries on the web and GenAI, we have tools that can explain things smoothly and productively wherever we are.

Do we not need a teacher or librarian to guide us? We need them more than ever; the last few years social media has shown that we can get so deeply siloed that we might learn little from new facts. The power of GenAI can be squandered, as any tool can. We need nudges to use it, guidance to know how to work with it and analysis to interpret its knowledge to know when to look for other places to evaluate its responses. And GenAI itself relies on many subsystems with strategies beyond Large Language Models (LLMs) that organize all the written material it can, and as human-guided reinforcement learning that helps understand prompts and present results. As well as using new technologies to help us explore, libraries offer a calm context, and librarians offer structure to help us concentrate on knowledge.

We teachers and librarians rely on books and online resources because we don't remember everything. We certainly don't have the ability as LLMs do to remember what hundreds of millions of people have said about a topic. The storyteller of old celebrated books they could refer to and get more stories from. So, we will do better by using the new generative library to get more and better material for learners.

Learning to learn is what we are doing in classes, in libraries and in life. Life isn't about memorizing answers, it is an open book test in which we need to know how to find answers. As we have better

tools for finding and organizing knowledge, the framing value of librarians becomes more important. With these new tools, people can produce things never before possible. They can assemble things across domains with grace. They can see and present countervailing facts instantly. The librarian is free to help formulate big questions, consider analysis, teach people to question what they see, consider broader contexts and create magnificent well-referenced solutions.

Conclusion and summary

This chapter positions new library technologies in terms of their power and the opportunity they give us for learning. It also focuses on how the learning stance and style we bring to questions impacts what and how we learn. The idea here is that web content and generative AI give parents, teachers and librarians new tools to create and test curricular and content ideas as they have never been able to be tested before.

These new tools allow a curious person to ask the same question from every perspective they can imagine. The Epistemic Insight Initiative Discipline Wheel can be a powerful guide for perspectives to ask such questions. The results that GenAI can provide are well-formed responses tailored to the requested style and language. A result of an articulate response is that it is easier to understand and learn from. The results of studying will not be the ability to write something up but the ability to compare different ways of thinking and answering questions. When a writeup is needed, the GenAI user has to know how to find reliable sources, and check the stories GenAI has presented to develop the point of view they are hoping to develop and share.

Recommendations

Be the mentor helping people use the tools that are available everywhere. As William Gibson said, 'The future is already here it's just not evenly distributed'. The future of libraries doesn't involve

spending hundreds of millions of dollars on books and buildings. I recently watched in awe as a group of Bengali tourists in a rainforest resort were laughing their heads off at a ChatGPT response. It seems they had asked it to present something as the most famous Bengali poet would; one of them was singing the Bengali answer.

Be the mentor that encourages people to ask questions.

Understanding is comparing alternative ideas, not having one idea. Asking big questions has always been the hard part.

Be the mentor that encourages people to find the problems with each of the solutions they are considering. The future library lets us ask what is wrong with an idea as easily as what is compelling about it.

Be the mentor that encourages people to see and combine knowledge that comes to bear on a question. We can enjoy the diversity of solutions and also how they combine from science, geography, history, theology, languages, literature, the arts, philosophy, engineering and maths.