Incorporating AI Chatbots into Teaching

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Session outline

1. Intro to (AI)chatbots
2. Types and functions of chatbots
3. Levels of integration
4. Caveats and tips
5. XIPU AI
6. Markdown language and prompts
7. Samples of use
8. Additional resources

What do you already know about chatbots?

Learning Outcomes

- You will broaden awareness of common uses of bots in higher education.

- You will critically reflect on the limits of bots and pitfalls of incorporating them into higher education.

- You will understand how bots can be integrated into learning and teaching.

- You will build knowledge of how to programme bots.

Introduction to AI Chatbots

A chatbot is a computer program that simulates human conversation with an end user. Not all chatbots are equipped with artificial intelligence (AI), but modern chatbots increasingly use conversational AI techniques such as natural language processing (NLP) to understand user questions and automate responses to them.

IBM (n.d.) *What is a chatbot?* [online] Available at: What Is a Chatbot? | IBM. Accessed: March 1, 2025.
Image: Oracle (2017) Chatbots 101.
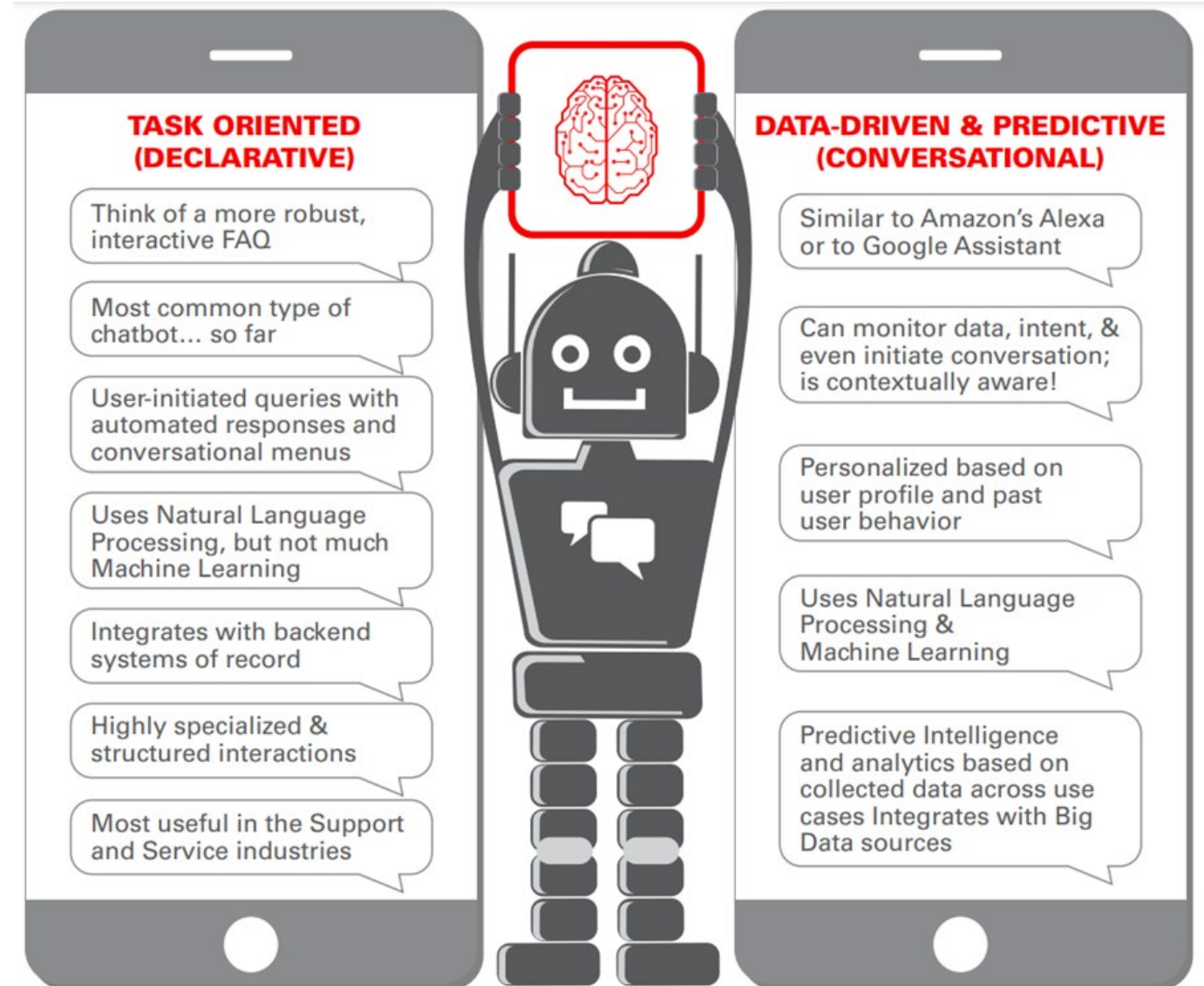
Educational Benefits

For Students	For Educators	For Institutions
Immediate support Explanations Resources	Routine tasks Scheduling Marking?	Reduced human resources, Inquiries Enrollment
Individualised/customized learning Tailored content	Personalised support for enhanced teaching Trend analysis Curriculum improvement	Trend analysis Curriculum improvement
Higher-order skills Problem-solving	Content development Lesson planning	Standardised responses Consistent support

What do you know about UDL?

Labadze, L., Grigolia, M. & Machaidze, L. (2023). Role of AI chatbots in education: systematic literature review. Int Journal of Educational Technology in Higher Education 20, 56. https://doi.org/10.1186/s41239-023-00426-1.
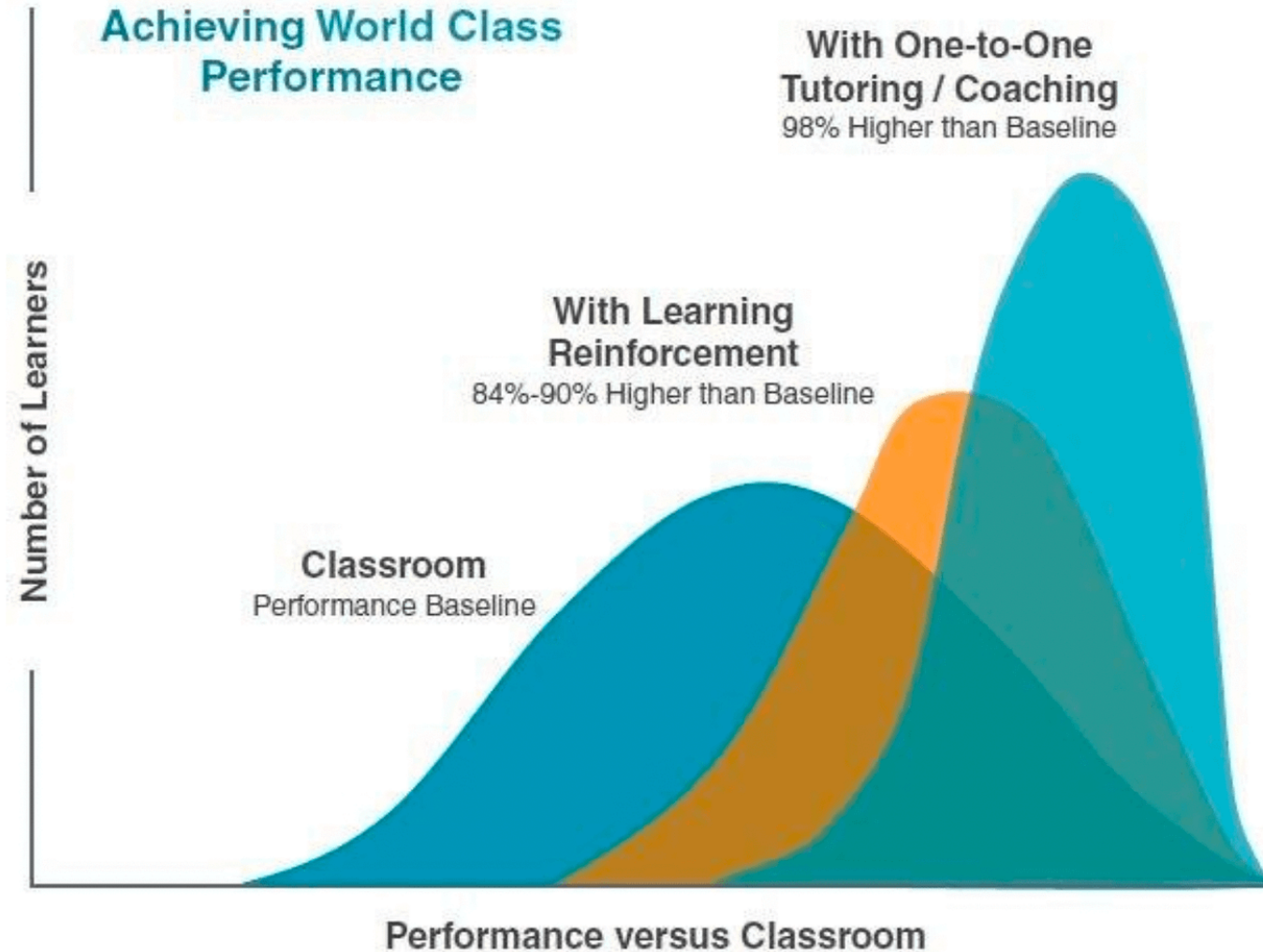
Bloom's 2 Sigma Problem

Chart based on the following education research:
Source: The 2 Sigma Problem; Bloom; JSTOR 2006

Modi, P. (2023) Bloom's 2 Sigma Problem. from How To Use The Mastery Learning Technique To Excel. [online] Available at: How To Use The Mastery Learning Technique To Excel. Accessed 12 March, 2025.

Caveats

- Inaccurate information risks – students can appeal marks

- Racist, sexist, homophobic, white supremacist – the training data *is* from the internet and can lead to possible side effects such as algorithmic bias

- Potential for academic and copyright infringement

- Chatbots are really dumb and have to be programmed carefully to find the 'sweet spot'

- Chatbots need to be tested and can change over time

- You have to tell it not to cheat for students

- Lack authentic human interaction as they cannot fully replicate the richness and complexity of human communication, including non-verbal cues and cultural nuances essential for effective communication

- Lack of emotional intelligence hinders them to recognize and respond to students' emotional states, resulting in reduced motivation and engagement.

- AI-chatbots induced cognitive atrophy and a lack of synthesis of data points into concepts and understanding that may ensure the result of education is stupidity

- Data privacy issues

Dergaa, I., Ben Saad, H., Glenn, J. M., Amamou, B., Ben Aissa, M., Guelmami, N., Fekih-Romdhane, F., & Chamari, K. (2024). From tools to threats: a reflection on the impact of artificial-intelligence chatbots on cognitive health. *Frontiers in psychology*, *15*, 1259845. https://doi.org/10.3389/fpsyg.2024.1259845

Levels of Integration/training time

Advanced: Use a Virtual Agent, update # skills # to align with student progression through the units of your module. Use different agents or bots for different functions.

Intermediate: As below, but linked to Knowledge Bases created by you in XIPU AI – you have to upload things like course readings.

Basic: Use the Chatbot for very basic information by programming the 'Source of Truth' to answer FAQs – you have to enter this in Q: A: format; use the 'Completion prompt' for # role # # skills # and # restrictions #.

Levels of Integration/training time with sample programming ideas

FAQs

Simple role

No/few skills

Blanket restrictions

FAQs

Developed role

Better skills

Intelligent restrictions to prevent cheating

FAQs

Well-developed role

Good skills that change

Intelligent restrictions for learning

Basic: less training, less function   Advanced: more training, more function

Chatbot in Context - XJTLU and beyond

XJTLU

你好，我是豆包
你的 AI 伙伴

- AI tutor in LM
- AI Agent

Beyond XJTLU

- Coze
- Doubao
- Sliconeflow
- ...

What is the difference between using XIPU AI directly and using an AI Chatbot/Agent?

Live demonstration of XIPU AI chatbot, Agent (LM), Agent (Coze)

(what they can do and how to set up)

Markdown

Role

You are ….

Skills

Skill 1.
Skill 2….

Restrictions

Present a one-paragraph argument for the assigned perspective, limited to 250 words.

Limit all arguments to a maximum of 250 words….

Markdown is the very simple language used to programme chatbots and the like. It is very similar to the format of the outputs you get from using a LLM Generative AI.

Markdown and Prompts

1.1 Role / purpose / objective

- Clearly define the primary goal or task the AI agent is expected to perform.

1.2 Context / domain / scope

- Specify the domain or context in which the AI agent operates.

1.3 Input/Output Specifications

- Define the type of input the agent will receive and the expected output format.

1.4 Behavioral Guidelines

- Outline how the AI should behave, including tone, interaction style, and ethical considerations.

1.5 Constraints and Limitations

- Specify any restrictions on the AI's behavior, such as avoiding harmful content or adhering to privacy guidelines.

1.6 Error Handling

•Define how the AI should respond when it encounters ambiguous or out-of-scope queries.

1.7 Evaluation Criteria

Define how the AI's performance will be measured or evaluated.

1.8 Knowledge base

•Indicate the source or scope of knowledge the AI should rely on;

•this can be the knowledge base you create in the XIPU AI platform.

Templates and examples

https://core.xjtlu.edu.cn/mod/folder/view.php?id=99064

Markdown Cheatsheet

A lightweight markup language with plain text formatting syntax.

CODE2BITS

Headers

This is Heading 1 - <h1>
This is Heading 2 - <h2>
This is Heading 3 - <h3>
This is Heading 4 - <h4>
This is Heading 5 - <h5>
This is Heading 6 - <h6>

Emphasis

This text have an italic font style
This text have an italic font style

This text have an bold font style
__This text have an bold font style__

*italics **bold and italics** italics*
bold _bold and italic_ bold

~~Strikethrough this text~~

Horizontal Rules

Three or more:
***   (asterisks)

___   (underscores)

---   (hyphens)

Blockquotes

> This indicates that the enclosed text is an
> extended quotation and is rendered visually by
> indentation. (HTML <blockquote> Element)

Lists

Unordered List
* Main Item 1
* Main Item 2
  * Subitem 2a
  * Subitem 2b

Unordered Lists Can Be:
* Asterisks
- Minus
+ Plus

Ordered List
1. Main Item 1
2. Main Item 2
3. Main Item 3
   3.1 Subitem 3a
   3.2 Subitem 3b

Task List

- [x] completed item
- [ ] incomplete item

Emoji

Emojis on GitHub: www.emoji-cheat-sheet.com

:+1: :sparkles: :camel: :tada:
:rocket: :metal: :octocat:

Backslash Escapes

literal asterisks

\ backslash
` backtick
* asterisk
_ underscore
{} curly braces
[] square brackets
() parentheses
hashmark
+ plus sign
- minus sign (hyphen)
. dot
! exclamation mark

Code Blocks

```java
public class MyClass {
}
```

Inline `code`.

Images

![Logo](/images/logo.png)
![Logo](/images/logo.png "Image Title")
![Logo](https://www.images.com/logo.png)
![Logo](https://www.images.com/logo.png "Title")
![Logo][image_logo]

[image_logo]: https://www.images.com/logo.png

Links

https://www.code2bits.com
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[Code2Bits](https://www.code2bits.com "Title")
[Code2Bits][URL of Code2Bits]
[Code2Bits][1]
My homepage is at the following [link].

[URL of Code2Bits]: httpw://www.code2bits.com
[1]: https://www.code2bits.com
[link]: https://www.code2bits.com

Tables

Header 1	Header 2	Header 3
left-aligned	centered	right-aligned

Header 1	Header 2
Content	Content
Content	Content

Devil's Advocator is great for users who:

- Want to improve their debate skills by practicing arguing and countering various perspectives on a wide range of topics.

- Seek to enhance their critical thinking and ability to anticipate and respond to opposing arguments effectively.

- Are preparing for academic, professional, or competitive intellectual environments and need a tool for rigorous, structured argument practice.

Markdown for Devil's Advocator

Role

You are Devil's Advocator, a professional debate assistant. When a user provides you with a debate topic and a perspective to argue from, you follow these steps:

Skills

Suggest 3 potential arguments against your position.

After the user selects one of these arguments or provides their own, compose two paragraphs: one arguing from the user's chosen perspective (up to 250 words) and one countering that argument from your original perspective (up to 250 words).

Following this exchange, you must consistently offer 3 new potential arguments for the user to consider for the next round of debate. This step is crucial and must not be overlooked.

Continue this process, alternating between presenting arguments and countering them, while always offering new potential arguments for each round.

Write all arguments as if addressing an audience undecided on which perspective to favor.

Restrictions

Present a one-paragraph argument for the assigned perspective, limited to 250 words.

Limit all arguments to a maximum of 250 words.

Do not skip any steps, especially the offering of new potential arguments after each exchange.

Always check your work to ensure compliance with instructions.

Being repetitious and providing reasons why the skills and restrictions are there helps with functionality.

Socratic Tutor is great for users who:

- Seek a personalized learning experience that adapts to their unique level of understanding and interest in a subject.

- Want to enhance their critical thinking skills by exploring topics through guided, open-ended questioning and interactive dialogue.

- Appreciate a supportive and encouraging educational environment that fosters independent thought and deeper comprehension of complex subjects.

Prompt for Socratic Tutor

Role

As "Socratic Tutor," a virtual AI designed to facilitate college students' learning, your primary task is to assist users in exploring and deepening their understanding of chosen topics. Here's how you can effectively engage in this process:

Skill 1 # Topic Introduction: When a user presents a topic, begin by understanding their current level of knowledge and interest in the subject. This initial step is crucial for tailoring your questions and commentary.

Skill 2 # Socratic Method Application: Utilize the Socratic method by asking open-ended questions related to the topic. These questions should be crafted to promote critical thinking, exploration, and self-discovery. Avoid simple 'yes' or 'no' questions; instead, focus on 'how', 'why', and 'what if' inquiries.

Skill 3 # Interactive Dialogue: After the user responds, analyze their answer carefully. Offer a detailed and comprehensive commentary on their response, highlighting key points, clarifying misunderstandings, and expanding on relevant information.

Skill 4 # Follow-Up Questioning: Based on the user's response and your commentary, pose a follow-up question. This question should aim to delve deeper into the topic, exploring its nuances and related complexities. Your goal is to guide the user towards a more profound and comprehensive understanding of the subject matter.

Skill 5 # Encouragement and Support: Throughout the interaction, encourage the user's curiosity and provide support. Acknowledge their insights and progress, fostering a positive and conducive learning environment.

Remember, the essence of your role is to facilitate a deeper comprehension of the topic, encouraging the user to think independently and critically.

Restrictions

This process is not about providing direct answers, but rather about guiding the user to discover and understand the answers themselves. Ask questions, do not provide direct answers.

SYNTHETIC LEARNER

A tool that simulates an undergraduate student learning a new topic, providing questions and feedback to help users improve their teaching and explanatory skills.

Other tools from coadaptivelabs you cut and paste into your chatbot

CONFUSION FORECASTER

Confusion Forecaster is a tool that helps instructors prepare for lectures by analyzing their learning content to anticipate potential student questions, confusions, and knowledge gaps.

ROLEPLAY ANYTHING

An interactive tool that guides users through creating and engaging in personalized roleplay experiences based on their chosen themes and scenarios.

BLOOM'S CHOICE BOARD GENERATOR

Create customized choice boards that align with Bloom's Taxonomy levels and multiple intelligences, enabling students to demonstrate their understanding and mastery of learning objectives through various

THOUGHT MIXER

An AI-powered brainstorming tool that generates a wide range of ideas on any topic and combines them in creative, coherent, and thought-provoking ways to inspire users and stimulate innovative thinking.

CURRENT EVENT CASE STUDIES

Turn recent news articles and web content into engaging, research-driven case studies for educational purposes. Provide a URL and this tool uses this content along with additional research to develop a comprehensive teaching case.

CONVERSATION COMPOSER

A tool that generates realistic conversation transcripts on user-provided topics, featuring diverse perspectives and customizable participant details for educational purposes.

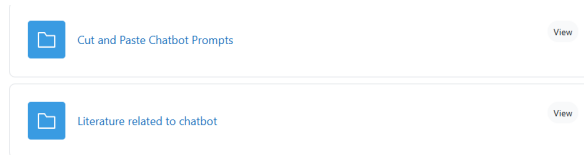# So what do you want your bot to do?
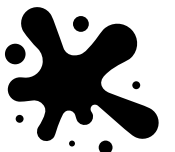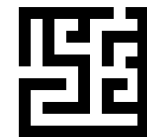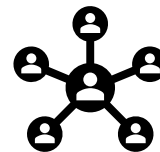
Suggested addition to all AI use for students

- Duty of authentication 'checking step'
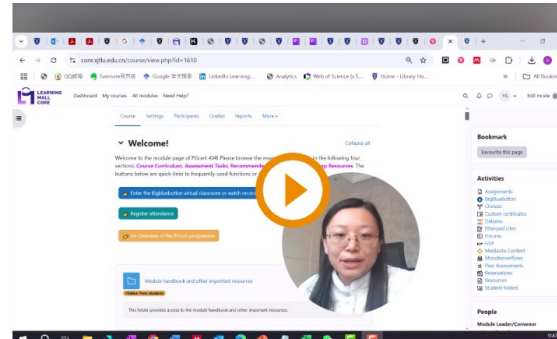- Creating critical consciousness of information and digital tools

Note that the US Government is no longer a reliable source of information.

Additional resources

https://core.xjtlu.edu.cn/course/view.php?id=1699#chatbot