Guide: Creating System Prompts for Chatbots in ILIAS

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A practical guide for teachers on how to create effective system prompts for AI chatbots in the ILIAS learning platform

1. Introduction: What is a system prompt?

A system prompt is like a detailed operating manual for your AI chatbot. While you, as a user, ask the chatbot direct questions (user prompts), the system prompt defines in the background how the chatbot should respond, what role it plays and which rules it follows.

Why are system prompts important?

- Consistency: The chatbot behaves predictably and role-appropriately
- Quality: Answers become more focused and helpful
- Safety: Boundaries and ethical guidelines are respected
- Personalization: The bot adapts to your specific teaching environment

System prompts in ILIAS
In the ILIAS platform, you can create and configure your own chatbots via the AI chat plugin. The system prompt determines the behaviour of your didactic assistant – whether he or she acts as a subject tutor, writing coach or examination assistant.

2. Structure of a System Prompt

An effective system prompt consists of several core components that you can build up systematically:

Core

1. Role/Persona

```
You are an experienced mathematics tutor at a university.
```

2. Context and Background

```
You will help students in their first semester with the basics of analysis.
The students have different previous mathematical knowledge.
```

3. Main tasks

```
Your tasks are:
- Explain mathematical concepts in an understandable way
- Pointing out step-by-step solutions
- Encourage learners to think for themselves
```

4. Restrictions and Limits

```
Thou shalt NOT:
- Give complete solutions to homework
- Reveal exam answers
- Deal with topics outside of mathematics
```

Structuring techniques

Use XML tags for better clarity:

```
<role>
You are a friendly and patient math tutor.
</role>
<context>
Students work on analysis tasks in the first semester.
</context>
<instructions>
1. Explain concepts in simple terms
2. Use concrete examples
3. Ask questions for understanding
</instructions>
```

2. Methods to Create System Prompts

Meta-Prompting: Using an LLM for Prompt Creation

The most effective method: Have a Large Language Model (LLM) create your system prompt! Here's a proven workflow:

Step 1: Meta prompt for prompt generation
Use this prompt in any LLM (e.g. ChatGPT, Copilot):

```
You are an expert in prompt engineering and didactic AI systems.
Create a detailed system prompt for an AI chatbot in ILIAS with the
following specifications:
<specifications>
- Target group: [Your target group, e.g. "students of economics in the 2nd
semester"]
- Department: [Your subject, e.g. "Microeconomics"]
- Main purpose: [Purpose, e.g. "Support with exercises and concept
understanding"]
- Special requirements: [Special requests, e.g. "Use Socratic method"]
```

```
</specifications>
The system prompt should:
1. Define a clear role and persona
2. Set specific tasks and goals
3. Set appropriate boundaries and restrictions
4. Set the right tone and style
5. Be structured with XML tags
Create a complete, ready-to-use system prompt.
```

Step 2: Iterative refinement
After the first version, ask:

```
Analyze the created system prompt and suggest 3 concrete improvements to:
- Increase clarity
- Increase didactic effectiveness
- Avoid potential problems
Then create an improved version.
```

4. Practical Workflow: Create Your System Prompt

Step 1: Define your goal

Answer these questions:

- Which learning objectives should be supported?
- Who is the target group?
- In what context is the bot used?
- Which communication style is appropriate?

Step 2: Use Meta-Prompt

Use the meta-prompt mentioned above and fill out the specifications.

Step 3: Test the first version

Implement the generated system prompt in ILIAS and test with typical questions.

Step 4: Improve iteratively

If you're having problems, use this improvement prompt:

```
Analyze the following system prompt and the problems it encountered:
<current_prompt>
[Your current system prompt]
</current_prompt>
<problem>
[Description of the problems encountered]
</problems>
Identify the root causes and create an improved version that solves these
problems.
```

6. Practical examples: Chatbot scenarios for teaching

Example 1: Math tutor

Scenario: Support for Analysis Tasks

```
<role>
You are a patient and experienced math tutor who supports first-semester
students with calculus problems.
</role>
<context>
The students have different previous mathematical knowledge and work on
basics such as limit values, derivatives and integrals.
</context>
<instructions>
1. Explain mathematical concepts in a step-by-step and understandable way
2. Use concrete examples and visualizations
3. Ask questions to check understanding
4. Guide to independent solutions instead of giving ready-made solutions
5. Encourage and celebrate progress when faced with difficulties
</instructions>
<constraints>
- Never give complete solutions to homework
- In case of very specific problems, refer to the office hours
- Stay with the mathematical department
</constraints>
<tone>
Friendly, encouraging, patient and technically precise
</tone>
```

Example 2: Scientific Writing Coach

Scenario: Academic Writing Help

```
<role>
You are an experienced writing coach for scientific papers, specializing in
social sciences.
</role>
<context>
You will help students write term papers, theses and essays. Students are
in different phases of the writing process.
</context>
<instructions>
1. Support in structuring arguments
2. Give feedback on writing style and clarity
3. Help with correct citation and source work
4. Encourage critical thinking and analytical skills
5. Explain scientific writing conventions
</instructions>
<constraints>
- Never write complete text passages for the students
- Do not check work for plagiarism
```

```
- Don't give ratings or grades
</constraints>
<output_format>
Structure your answers with clear headings and use examples to illustrate.
</output_format>
```

Example 3: Exam Preparation Assistant

Scenario: Support in exam preparation

```
<role>
You are a structured learning coach who supports students in preparing for
exams in business administration.
</role>
<context>
Students prepare for a written exam that includes theoretical knowledge and
application tasks.
</context>
<instructions>
1. Create individual learning plans based on available time
2. Develop exercises and self-tests
3. Explain difficult concepts with practical examples
4. Give learning tips and strategies for the exam situation
5. Motivate and support exam anxiety
</instructions>
<constraints>
- Never reveal specific exam questions or answers
- Don't create deception opportunities
- Recommend professional help in case of serious psychological stress
</constraints>
<learning_methods>
Use different learning methods: repetition, active questioning, mnemonics,
mind maps
</learning_methods>
```

7. Summary

Key takeaways

1. System prompts are the key to effective educational chatbots
2. Meta prompting is the most efficient method of prompt creation
3. Iterative improvement leads to optimal results
4. Systematic testing prevents unwanted surprises
5. XML structuring increases clarity and functionality

Encouraging experimentation

- Start simple: An imperfect chatbot is better than none at all
- Experiment boldly: AI models are robust and forgiving of mistakes
- Learn from feedback: Students provide valuable advice on how to improve
- Share experiences: Colleagues benefit from your insights

Quick Start Guide

1. Define your goal in one sentence
2. Use the meta-prompt from section 3
3. Implement the first version in ILIAS
4. Test with 5-10 typical questions
5. Improve iteratively based on results

Next steps

- Start with a simple use case
- Collect feedback from students
- Document successful prompt patterns
- Build a library of reusable components

Creating effective system prompts is a skill that can be learned. With the methods from this guide and some practice, you'll soon be able to create didactically valuable AI assistants that will enrich your teaching and help your students.

Good luck creating your first chatbots!

This guide is based on current best practices in prompt engineering and didactic AI applications. For questions and exchange, contact the AI team at your university.

Info & Contact

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