

Preppy

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The interface features a central card with the title "Covalent Bond". Below it are buttons for "Flip Card", "Next Card", "Back", "New", and "Help". A question mark icon is in the top right corner. The background is light green with various educational icons like a clock, apple, magnifying glass, and graduation cap.

04. User Analysis and Data Handling

Target Audience:

- Student:
 - Middle school till end of school
 - 12 - 18 (core group)
 - Tasks: study materials, organization, practice material
- Teacher:
 - STEM (core)
 - Additional classes for Phase 2
 - Tasks: oversight on student progress, capability to upload the material, automatic test, and flashcard generation

What data will be measured, and how will it be handled?

- Students submit mock exams and flashcards exercises.
- AI software grades the exams and exercise and sends anonymous reports to the teacher.

05. Risk Management

There are several risks that have to be kept in mind while using LLMs.

Incorrectness and hallucination, discriminatory or inappropriate language

- message when flashcards are generated
 - teacher might take a look
- Allow users to report this to be reviewed

Non-age-appropriate language for different age levels

- Allow teacher to select age range
- instruct AI to speak in a manner appropriate for this range

The interface features a central card with the title "Mock Exam Periodicity and the Periodic Table". Below it are buttons for "Back", "New", and "Help". A question mark icon is in the top right corner. The background is light green with various educational icons.

Question 1: What is the atomic number and mass number of an element with 17 protons, 18 neutrons, and 17 electrons?
Answer: _____

Question 2: Identify the element located in Period 3, Group 2 of the periodic table. Provide its chemical symbol and name.
Answer: _____

Question 3: Draw the Lewis structure for methane (CH₄).
Answer: _____

Question 4: How many moles of water (H₂O) are produced when 2 moles of hydrogen gas (H₂) react with 1 mole of oxygen gas (O₂)?
 Balanced equation: 2H₂ + O₂ → 2H₂O
Answer: _____

Question 5: Balance the following chemical equation: C₂H₆ + 5O₂ → 3CO₂ + 4H₂O
Answer: _____

Question 6: Define enthalpy (ΔH) and describe its significance in chemical reactions.
Answer: _____

01. Introduction

Preppy is an educational system intended for grade students and teachers that combines traditional study elements such as flashcards and mock exams with new AI technology to allow students and teachers to save time in creating study material and focus on understanding of course materials. This tool addresses students who wish to practice more mock exams but are often limited by the amount of mock exams the teacher provides, students who wish to study flashcards but must spend hours creating them first, and students who are shy about asking teachers questions about basic materials. This tool also allows teachers to assign mock exams and analyze scores to personalize lesson plans for student understanding.

06. What is AI generated?

Flashcards & Mockup exams

- The teacher can use AI to generate flashcards and mockup exams based on any material they upload. For fine-tailored generation, they can highlight the parts of the document they want to include into the generated flashcards or exam questions.

Chatbot

- AI-based chatbot is accessible for students from any page of the website to help with understanding and revising the content.

AI analysis & feedback

- AI is used to analyse the students' performance on mockup exams as well as the time they spend reading and revising study materials. Personal feedback is provided to each student. The teacher gets general anonymised student performance analysis on Teacher's Dashboard page.

07. Policy Recommendation

Data Protection Policies

- Server encryption
- Only information that are actually needed
- Login for teacher and students
- Class Codes for students

Fairness

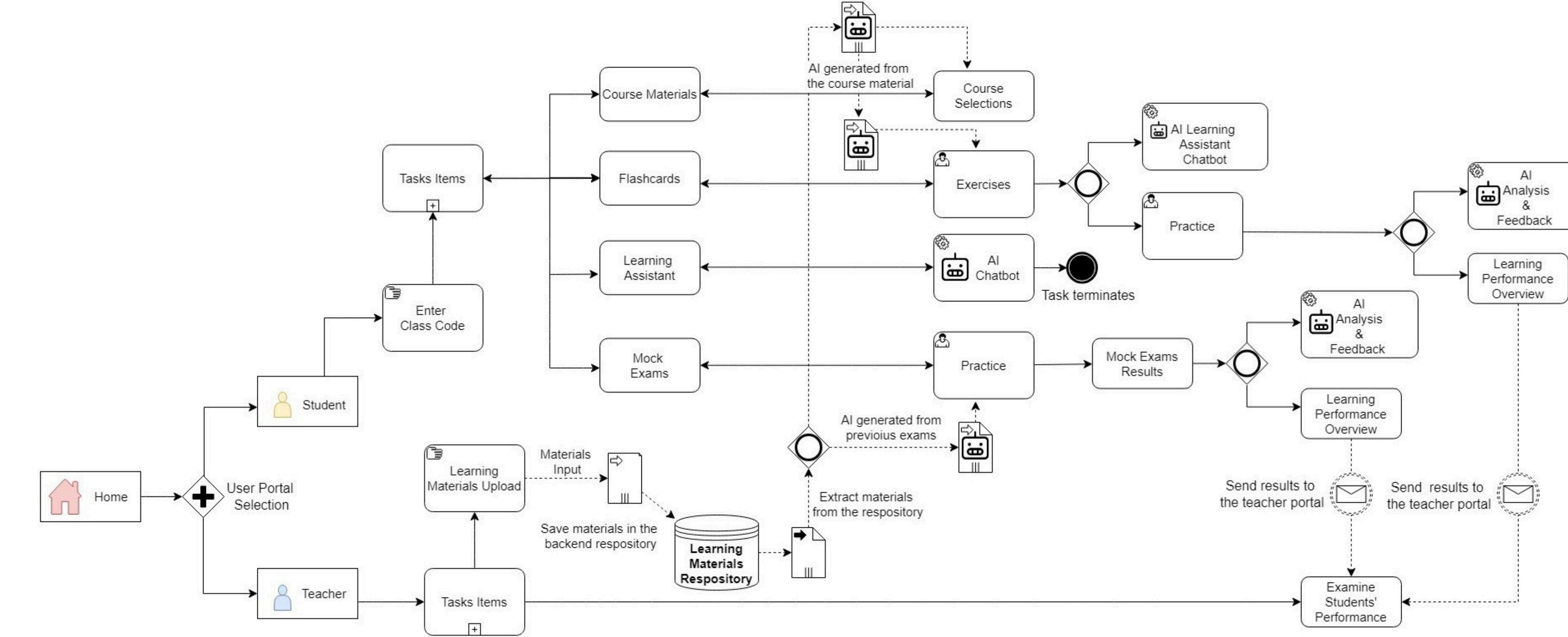
- No explicit information about sensible data
- The mock up results are encrypted for the teacher
 - No further consequences for the students

02. Gaps in Current Tools

- Similar systems:
 - Moodle (course materials)
 - Quizlet (automated flashcard generation)
 - Anki (just flashcards)
- No one system that combines multiple aspects of AI (chatbot, generated flashcards, generated mock exams) with an education course material platform

03. Expected Benefit

- Saves time for the teacher to focus on creating lesson plans
- Saves time for the students in creating flashcards
 - Can go straight to studying
- Ensures study materials are correct by eliminating human error
- Centralizes all study and course materials to one website for ease of access



08. Related literature & QR code to Prototype

For generating sample Flashcards, Mock Exams, and the Learning Assistant, ChatGPT was used.

Sources of learning materials:

- https://www.uah.edu/images/administrative/student-success-center/resources/handouts/handouts_2019/periodic_trends.pdf
- <https://mrkremerscience.com/wp-content/uploads/2013/08/g9-chemistry-vocabulary.pdf>

