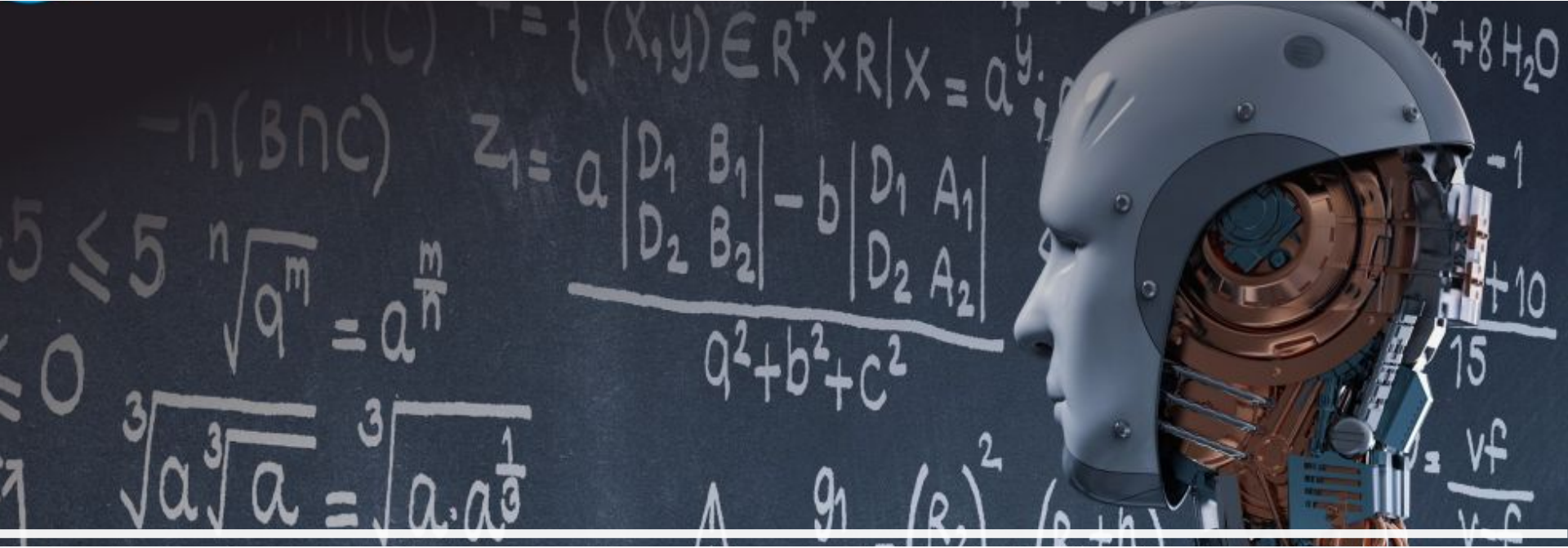


ProfessorBob, The AI-Powered Virtual Teaching Assistant

Using AI & Natural Language Processing to optimize knowledge management

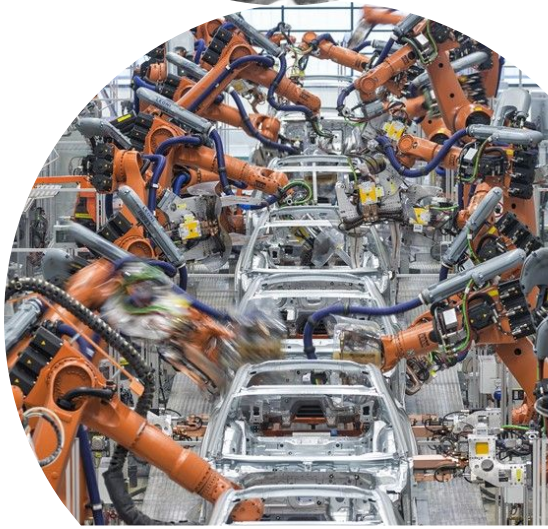
ProfessorBob.ai

AI, THE Next Revolution for Education

ProfessorBob.ai is a Virtual Teaching Assistant
that **teaches, answers & asks questions,** as well as **personalizes** courses, 24/7.

ProfessorBob.ai added-value:

1. answer 80% of the students' question 24/7
2. divide teaching & support costs by 5
3. increase knowledge retention by a factor of 3
4. increase the retention rate by 20% to 50%.
5. ultra-personalize courses to the need of each learner & allow 40% of the students to learn twice faster



Highlights of our features

ProfessorBob.ai

1

Q&A

Provide a relevant, precise and concise answer to 80% of the questions. The remaining 20% are covered by field experts.

→ Humanizing the online experience/ Reduce cost by 5

2

Memory Anchoring

Applications of cognitive science learning techniques to optimize students assimilation of knowledge.

→ Increasing memory anchering by a factor of 3

3

Adaptive learning

Personalize the learning paths for each learner based on their needs, performance and progress.

→Improved learning outcomes / 40% of the students learn twice faster

Nos Clients

OPENCLASSROOMS

3 M students/month

L'École supérieure de la banque

L'Expertise CFPB

35000 online learner

CNED

AU SERVICE DE TOUTES LES RÉUSSITES

250 000 students

Assistant d'enseignement
sur 3 matières collège / lycée

(Littérature, Sciences & Transversal)

ASCOR

espace-concours.fr

12 000 online students

CAP Petite Enfance
CAP Prothésie ongulaire

3W ACADEMY

10 000 online students

Développement Web (HTML, CSS, PHP)

E.A.J.F

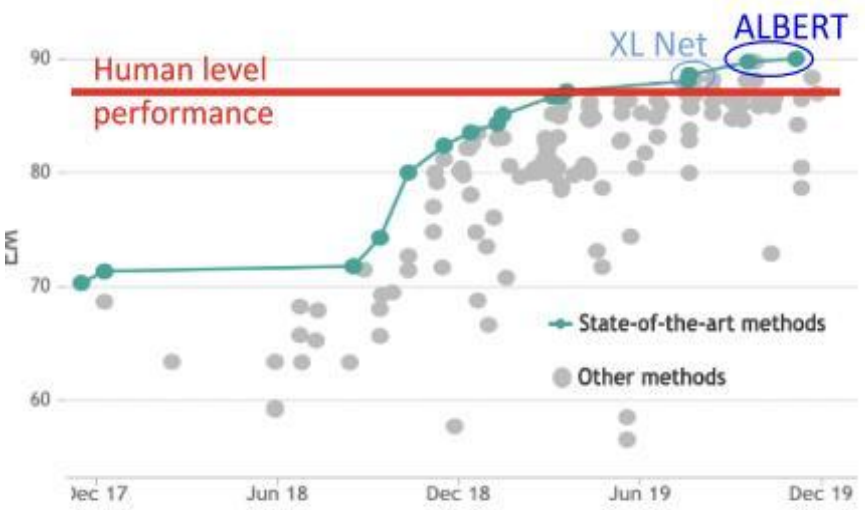
ÉCOLE DES AGENTS DE JOUEURS DE FOOTBALL

300 online students
Droit sportif

Discussions en cours

Deep Tech : NLP & Personalized Search Engine

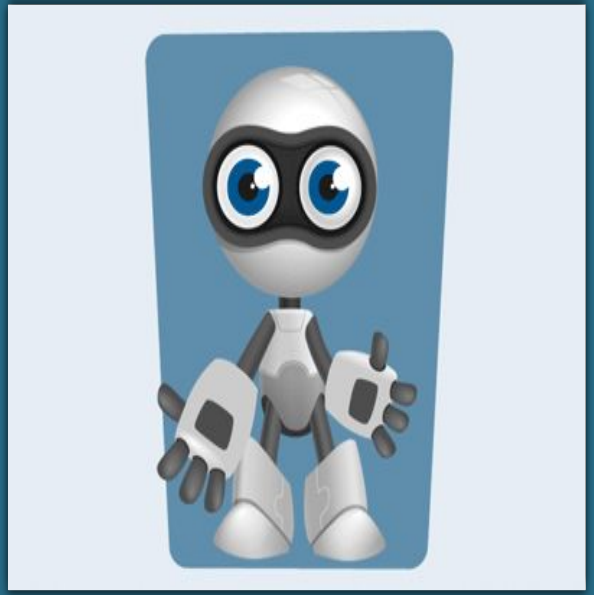
- ProfessorBob.ai is developed by a team expert in AI (+ a partnership with the CNRS) & relies on the latest advances in Machine Learning & Natural Language Processing.
- Some of our NLP models have beaten humans on standardized Q&A sets (SQuAD v2) in 2019.



HOW does BOB revolutionize the educative system ?

OLD GENERATION

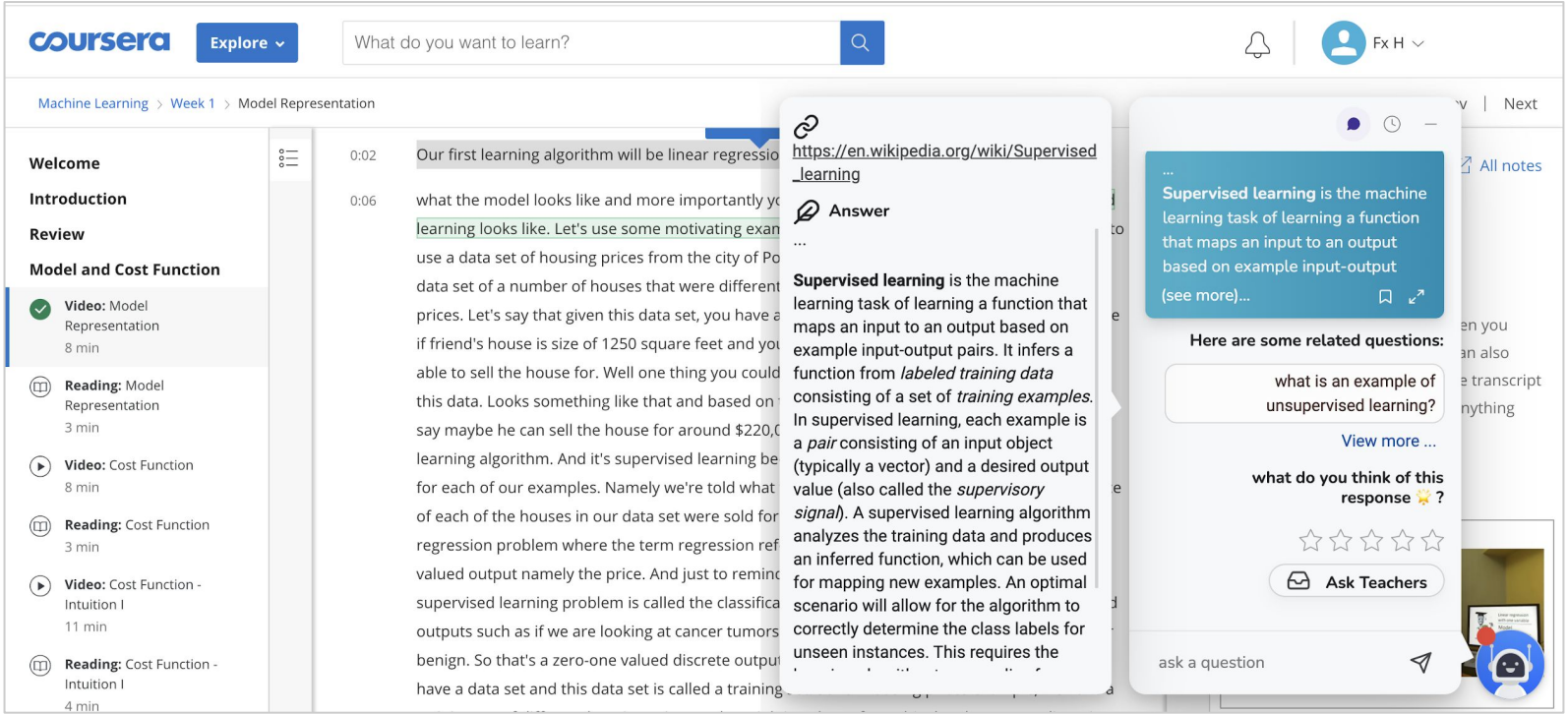
Based on **decisions trees** and therefore a **drop-down list of possible options** rather than NLP technologies that understand language.
Responds with **pre-establishes scenarios** through decision trees.

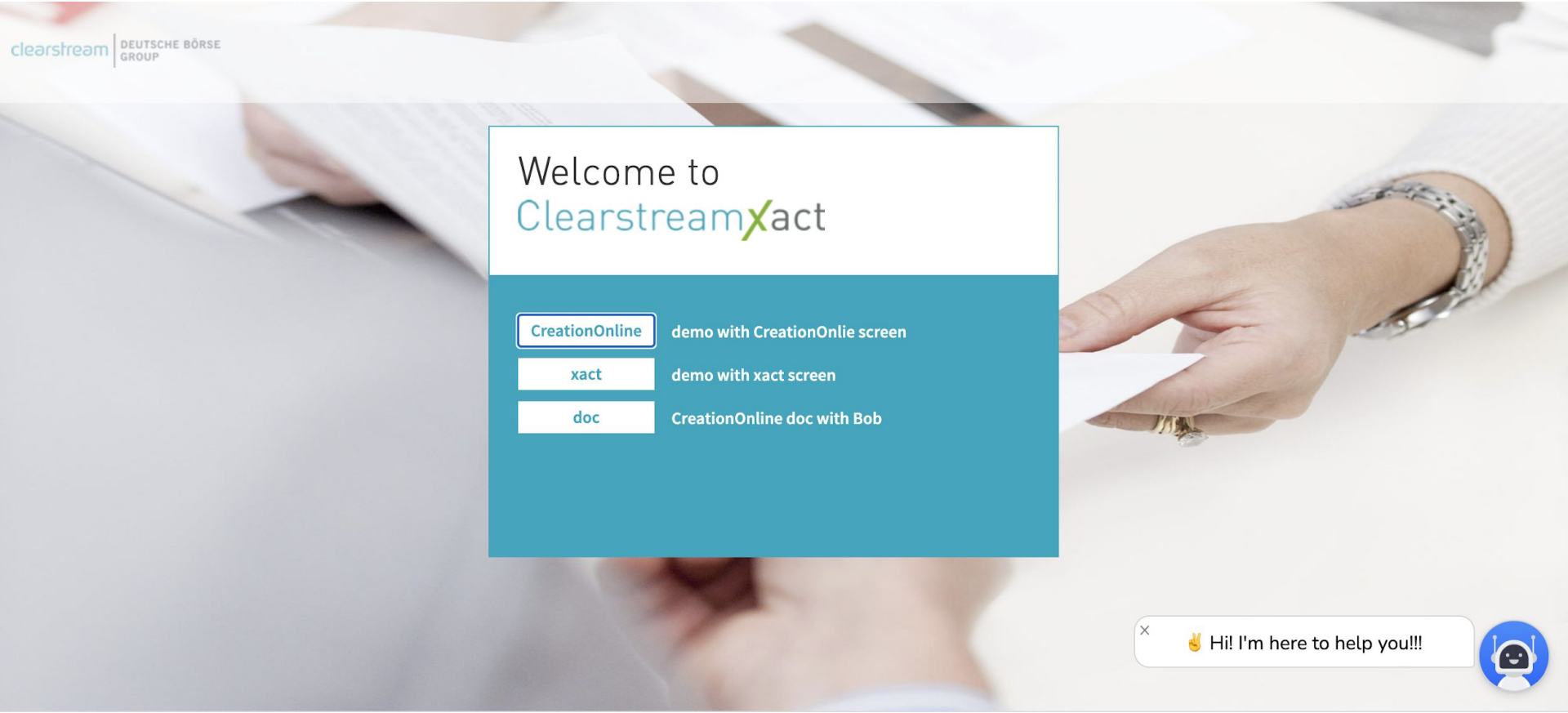


NEW NLP GENERATION

The core algorithms are based on **NLP models**.
Both requests and answers are formulated in natural language.
The **implementation** of Bob can be **done in 2 weeks** whereas it takes at least 6 months for a decision tree based chatbot.

ProfessorBob sur Coursera (Machine Learning)




clearstream
DEUTSCHE BÖRSE GROUP
Welcome to
ClearstreamXact
CreationOnline
demo with CreationOnlie screen
xact
demo with xact screen
doc
CreationOnline doc with Bob
✌ Hi! I'm here to help you!!!

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DETAILED OVERVIEW :

How does each feature work?

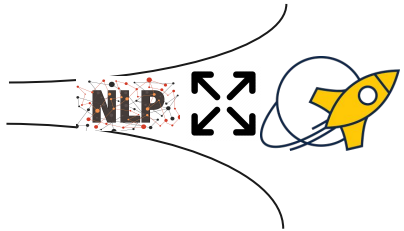
How is knowledge acquired by ProfessorBob?

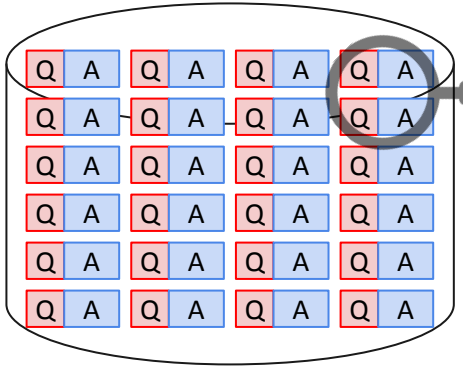
Thanks to the NLP advances, ProfessorBob extracts the knowledge from the ingested content and generates thousands of « Questions & Answers » pairs.

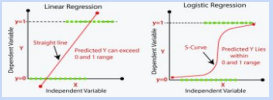
ProfessorBob.ai

Bob secret sauce

your courses



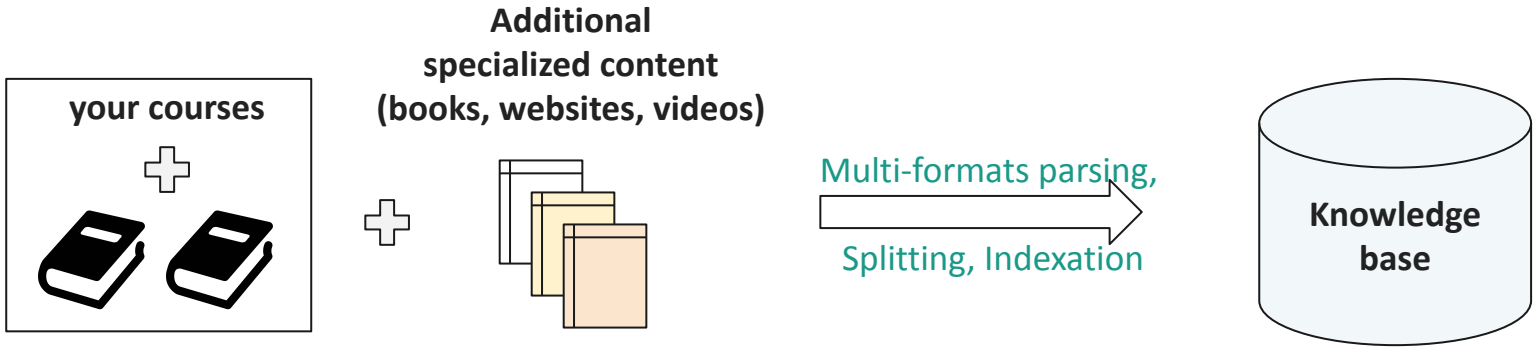


What is supervised learning?	Supervised learning is the machine learning task of learning a function that maps an input to an output based on example input-output pairs.
What are the differences between linear and logistic regression?	The Linear Regression is used for solving Regression problems whereas Logistic Regression is used for solving the Classification problems. 

1. Knowledge Ingestion & Indexation

ProfessorBob ingests:

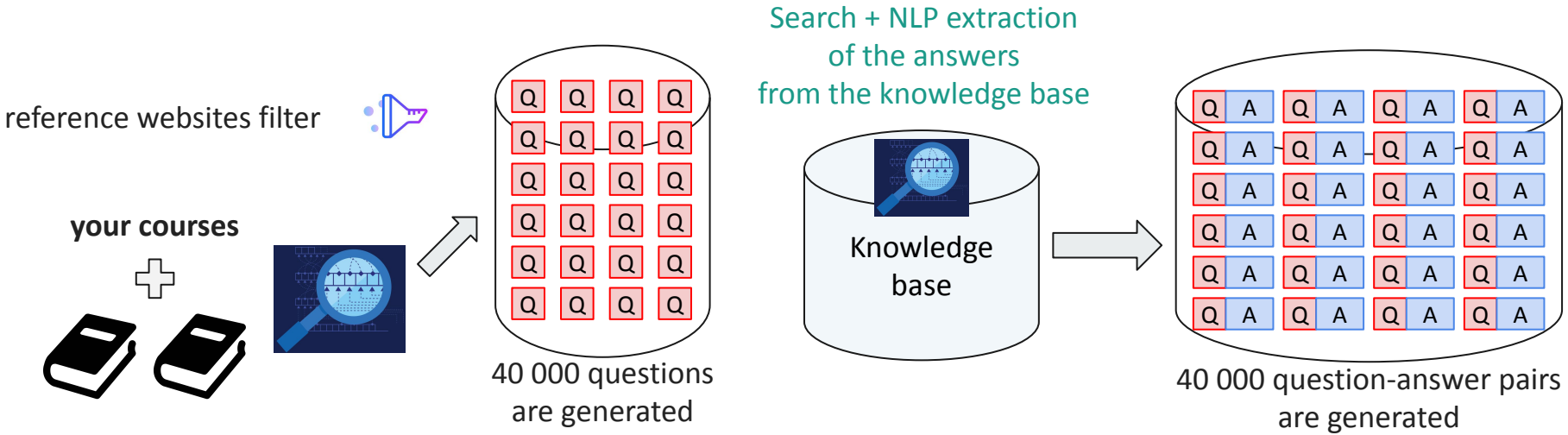
- **YOUR content:** no matter the format (Word, ePub3, PDF, HTML, XML, Speech To Text for media)
- **Supplementary content** (validated with you): specialized books & websites to improve the coverage of the topic



2. Questions generation / Answers identification

a. Automatic Generation of ~40 000 questions on the topic :
   - Semantic Filtering of FAQ related to the topic.
   - Generation of relevant questions on the content through NLP

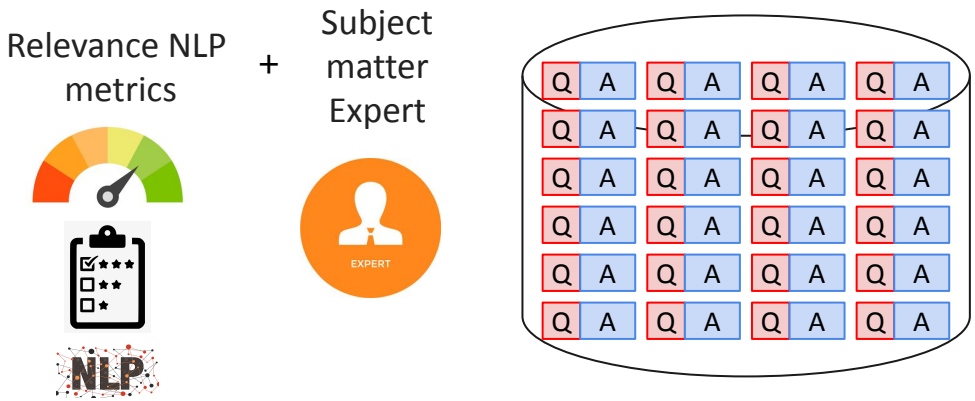
b. Identification of the answer to each question from the knowledge base (built via content ingestion)



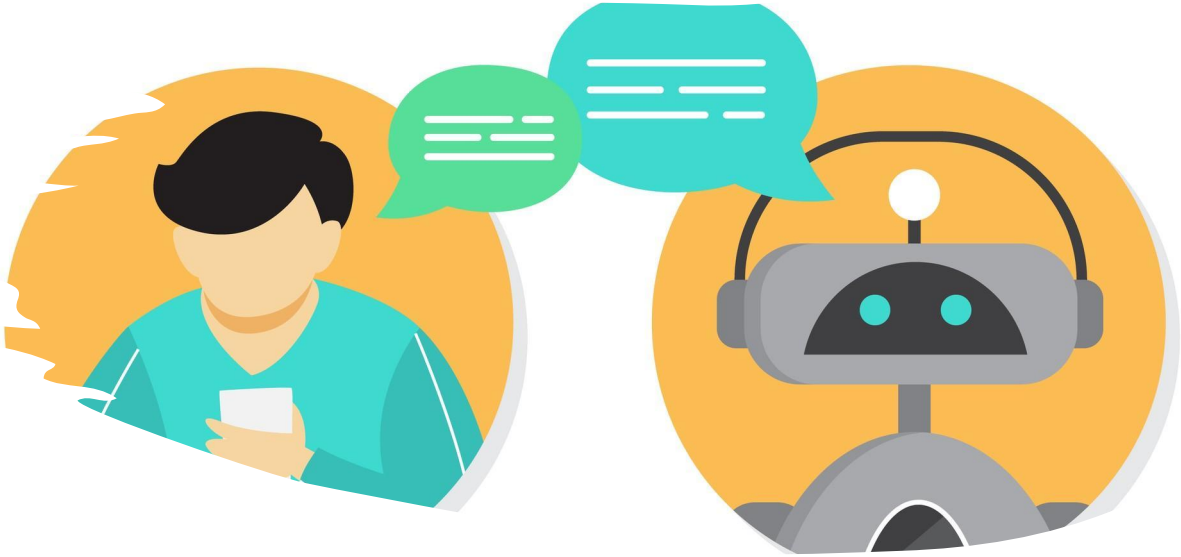
3. Selection of the most relevant Questions/Answers

a. Automatic filtering of the ~3 200 most relevant « questions – answers» pairs that fully cover the content thanks to a combination of advanced NLP metrics

b. Manual validation by a subject matter expert of the « question – answer » pairs (~3 days).



3 000 question-answer pairs that are fully relevant & precise.



Feature 1: Question Answering

ProfessorBob.ai

Advantages of the question answering feature

Deployed promptly on a large corpus of various academic subjects and across various applications

Instant access to knowledge

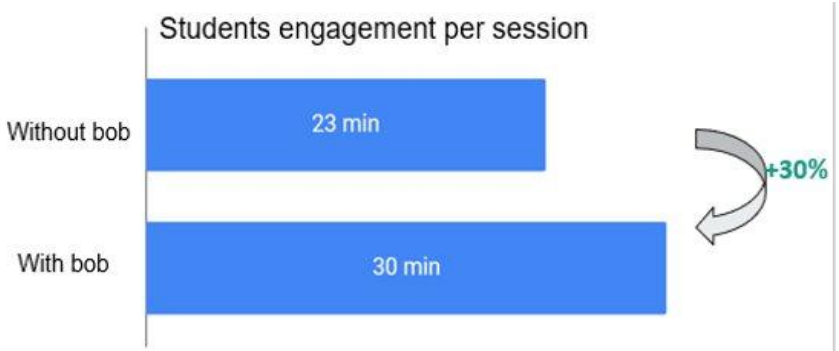
Availability 24/7

Costs Reduction

Learners' engagement improved by 30%

Average duration of learning sessions:
(source TAI / 3WA) *:*

- **23 minutes WITHOUT ProfessorBob**
- **30 minutes WITH ProfessorBob**, i.e. **+30%**
- **4 questions on average per session**



By answering 24/7 to learners questions, **Bob increases their engagement**, allowing them to overcome difficulties, better understand & explore the content, & even discover further knowledge on related topics for the most curious.

Bob bénéficie des dernières avancées du NLP

Les chatbots traditionnels

Basés sur des scénarios pré-scriptés manuellement (représentés sous formes d'arbres de décisions) et la détection des intentions de l'utilisateur :

✘ Travail manuel fastidieux de définition des scénarios sur plusieurs trimestres.

✘ Très petits nombres de cas couverts.

Notre Assistant NLP / TAL

ProfessorBob utilise les dernières avancées en Traitement Automatisé du Langage naturel (TAL / NLP) pour **s'entraîner** de manière automatisée puis répondre à un très grand nombre de questions en langage naturel.

Son entraînement et déploiement peuvent être réalisés en quelques semaines.

Feature 2: Memory Anchoring through Cognitive Science Learning Techniques

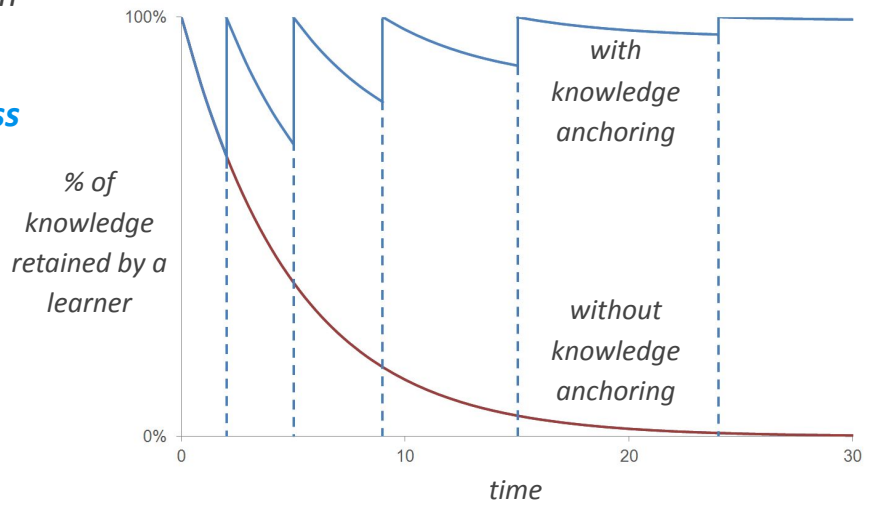
ProfessorBob.ai

Consolidation of knowledge retention

On average, 80% of the acquired knowledge is forgotten after 2 days.

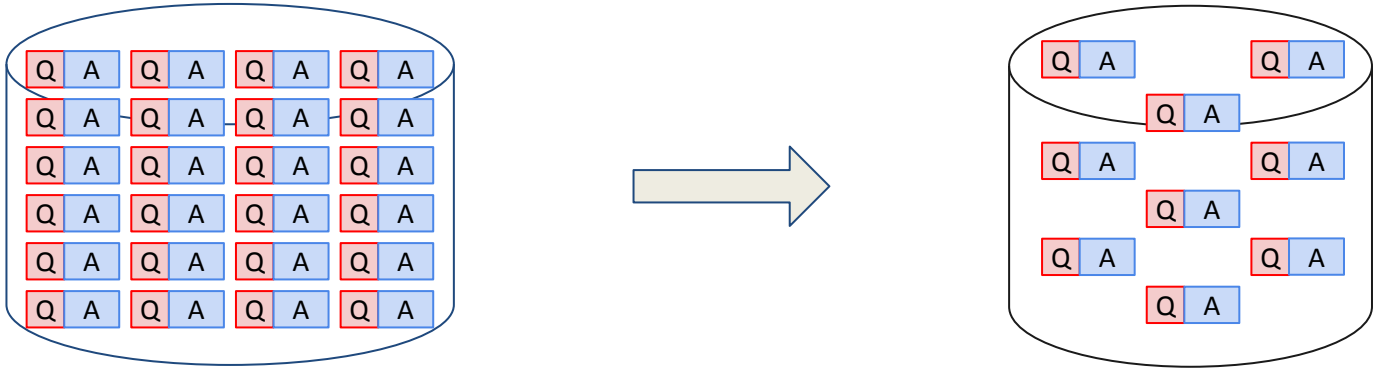
*To overcome this issue, spaced repetition is key to **assess & consolidate knowledge memorization**, for instance after 2d / 7d / 30d / 90d.*

Professor Bob operates this anchoring thanks to daily questions/answers on recently acquired knowledge. In case of failure, Professorbob refers to the relevant course.



Reuse of the already generated questions

For the assessment of knowledge retention, part of the 3,000 pairs of questions & answers previously generated are reused & associated with knowledge concepts.

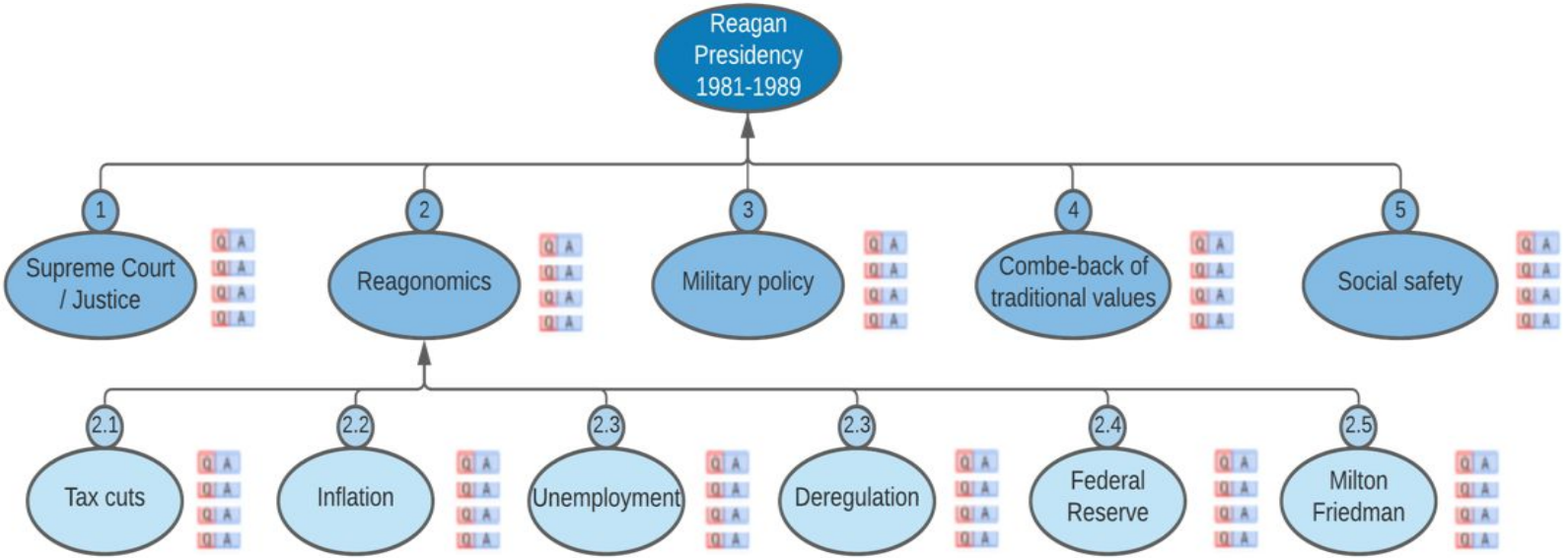


3,000 pairs of questions & answers

200 pairs of questions and answers

*Bob compares the learners' answer with that of the question-answer pair to calculate a **match score.***
A self-assessment can also be implemented or the question-answer pairs can be transformed into MCQ.

Example of a Knowledge Tree



Steps of the retention system

A. Preparation

1. **Representation in knowledge trees:** NLP extraction of knowledge concepts & association with content, generation of trees, manual finalization.
2. **Association of sets of questions / answers to knowledge:** semantic association between the knowledge and the generated Q / A.

B. Implementation

To monitor the knowledge acquired by a learner on the knowledge tree:

Daily emails with a maximum of 3 questions per day (capping):

- D + 2 for new knowledge or D + 2 / + 7 / + 30 / + 90 depending on previous results:
  - If OK, next questions at D + 7 / + 30 / + 90
  - If KO, referral to the initial course + reinitialization of the next questions at D + 2

ProfessorBob.ai

3. Adaptive Learning

to dramatically improve learning outcomes

Adaptive learning for better learning efficiency

In order to implement adaptive learning, pedagogical rules are put in place to personalize each learner's learning paths according to his/her results. Exercises' difficulty is selected according to the students' progress.

Benefits for learners :

- **Advanced students learn 2x faster & deeper**. The better they perform, the more they are challenged.
- **Students in difficulty receive the necessary support** to continuously improve **through discipline-specific remedial work, possibly based on prior knowledge.**

Benefits for trainers :

- Monitoring of acquired knowledge & knowledge gaps in order to **tailor courses & keep them up to date.**
- Early detection of **at-risk students**

Steps for adaptive learning

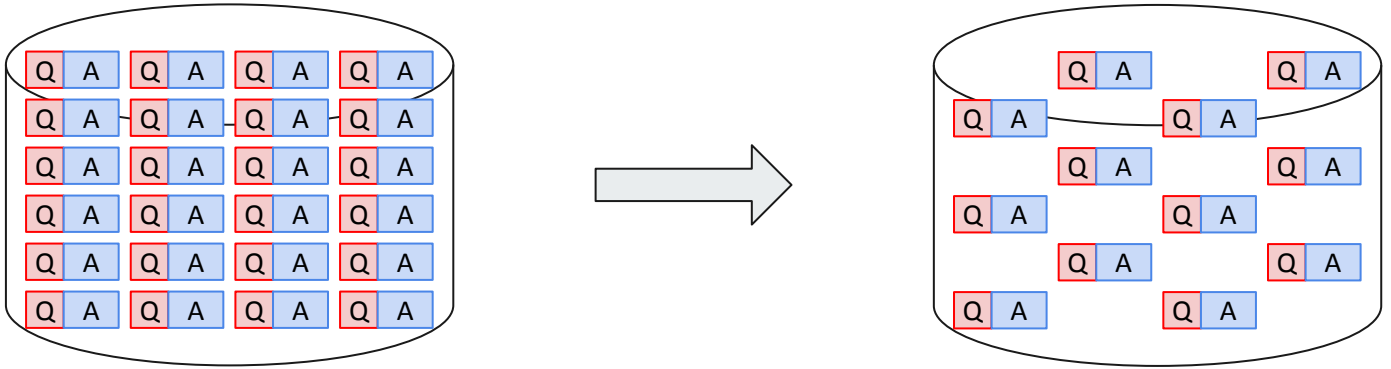
To implement adaptive learning, ProfessorBob must be able to track learners' progress within the knowledge tree as well as define the pedagogical function of each grain of content.

Therefore, the following steps are needed:

1. Build a **knowledge tree** that includes the **pre-requisites.**
2. Design **various exercises with different difficulty levels** (at least 3 levels)
3. Define the **initial rules for customized learning paths** (pedagogical algorithms)

How is adaptive learning applied?

From the previously 3 000 generated of Question & Answer pairs,
around 800 questions are selected to be reused as MCQs.

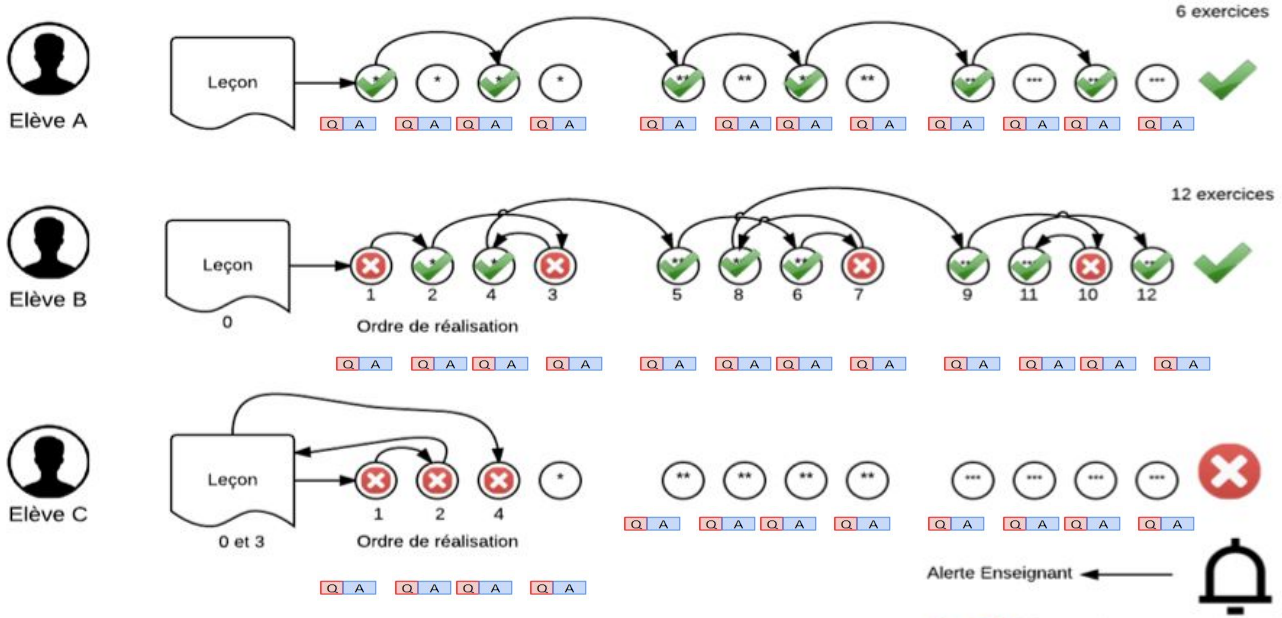


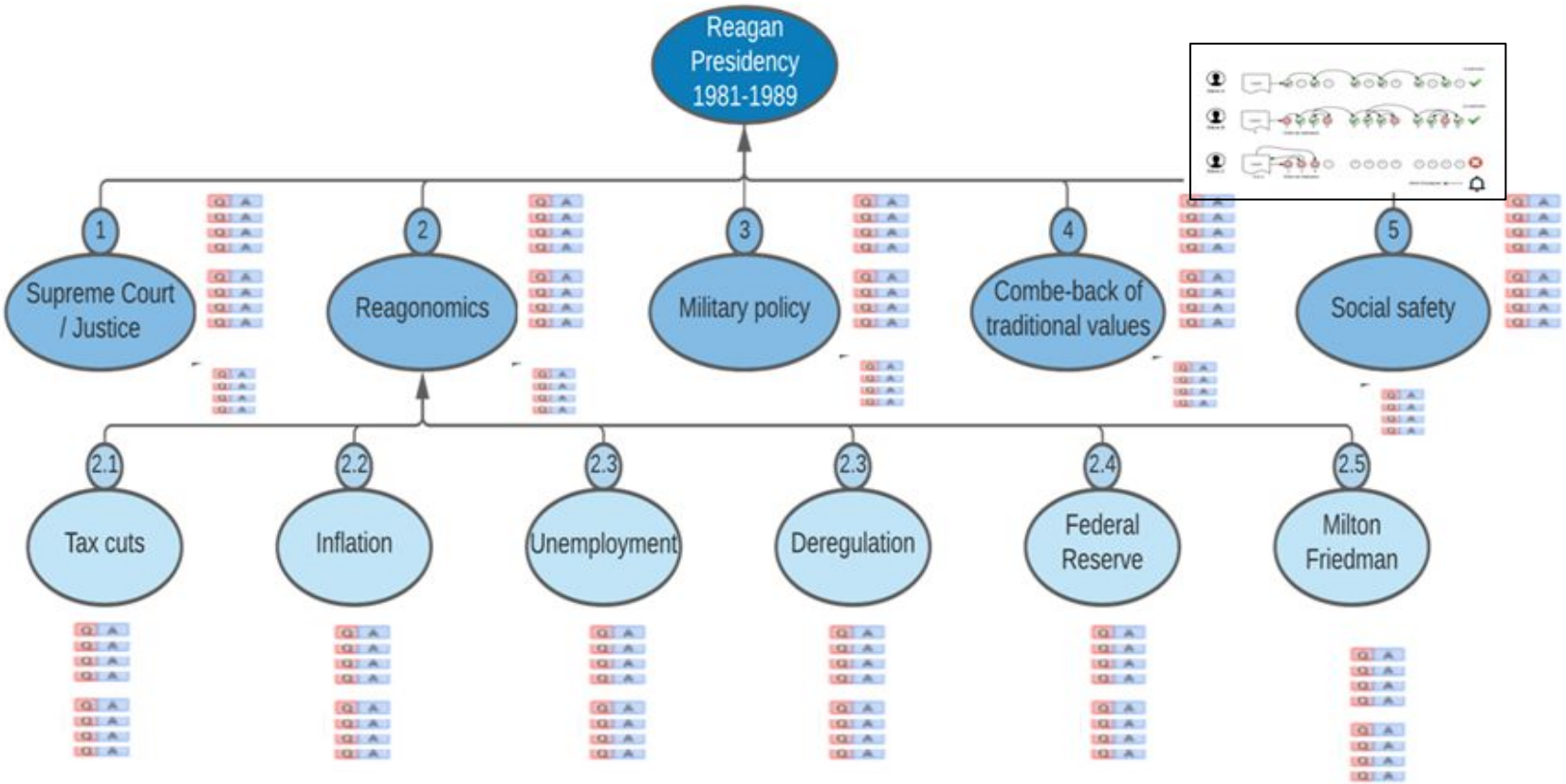
When the user provides its answer, ProfessorBob calculates a **matching score** with the answer from the Question/Answer pair.

- **Other types of exercises for adaptive learning can be implemented on request.**

An example of differenciated learning

Example: 3 students are doing the same course chapter with 12 exercices and 3 levels of difficulty. Since the 3 students are not obtaining the same results, their path is adapted based on their performance.




Reagan Presidency 1981-1989
1
Supreme Court / Justice
2
Reagonomics
3
Military policy
4
Combe-back of traditional values
5
Social safety
2.1
Tax cuts
2.2
Inflation
2.3
Unemployment
2.3
Deregulation
2.4
Federal Reserve
2.5
Milton Friedman

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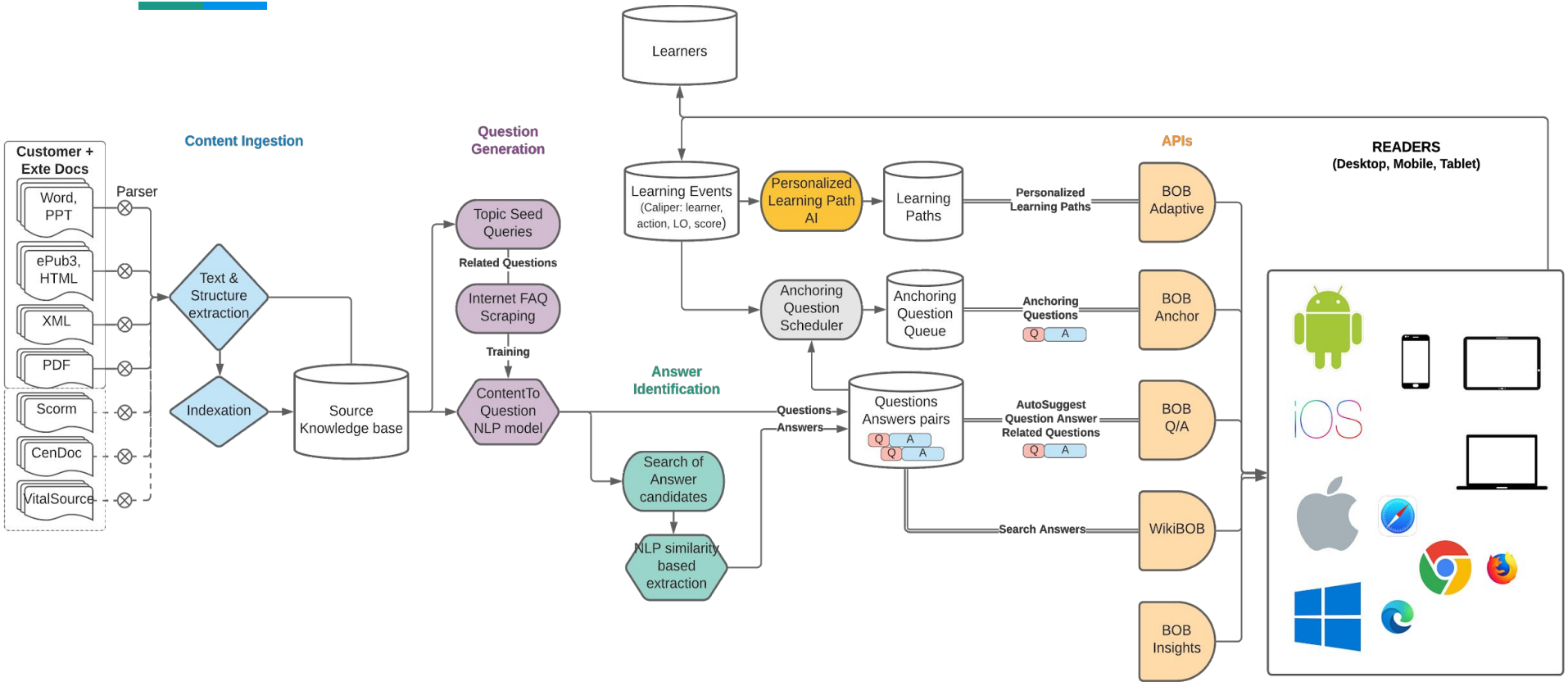
How is ProfessorBob.ai adding value the reader learning experience

A fully-automated Knowledge acquisition workflow + APIs to integrate ProfessorBob services into your interface



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Summary

WHAT WE ARE OFFERING

HUMANIZE THE LEARNING EXPERIENCE:

CONTENT FOCUSED QUESTION ANSWERING

MEMORY ANCHORING

POP-UP QUIZZES ACCORDING TO THE SPACED REPETITION METHODOLOGY

ADAPTIVE LEARNING

PERSONALIZED TO YOUR SPECIFIC NEEDS

***: We also offer a technical support version of ProfessorBob**

ProfessorBob.ai

Starting a POC with ProfessorBob™

- ❑ Define together the modalities of ProfessorBob's proactive interventions.
- ❑ Provide the pedagogical content (courses, exercises/corrections, FAQ...).
- ❑ Study together the integration on your platform and workflows (integration via iFrame or browser extension…)
- ❑ ProfessorBob’s avatar can be customized (female/male version) and/or be animated on demand.

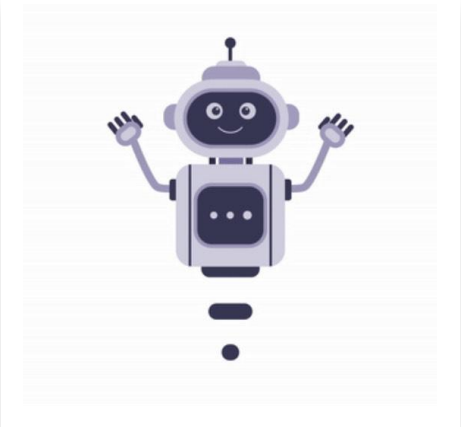

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illustration

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Bob Question and Answer

eTextbook: Liberty, Equality, Power: A H...

30-1. Searching for Direction, 1974–1980

30-2. The Reagan Revolution, 1981–1992

30-3. Renewing and Ending the Cold War

30-4. The Politics of Social Movements

Conclusion

Review

Critical Thinking

Identifications

Suggested Readings

31. Economic, Social, and Cultural Change at the D...

32. A Time of Hope and Fear

Page précédente
30-1d. The New Right

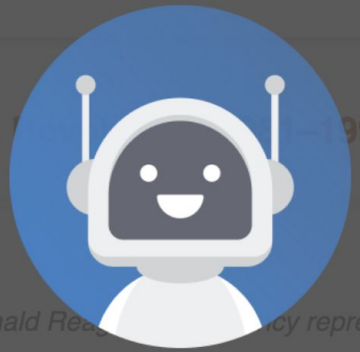
Page suivante
30-2a. The Election of 1980

30-2. The Reagan [illegible]–1992

Q

To what extent did Ronald Rea[illegible]cy represent a victory for the New Right agenda in both domestic and foreign policy?

Ronald Reagan courted the New Right on national security, economic, and social issues. He used the hostage crisis with Iran as a symbol of Carter's failures, while his militantly anticommunist rhetoric included calls for a stronger military posture and greater defense spending. A taxpayer revolt that had swept through California politics during the late [illegible]'s attack on "tax-and-spend" policy-making at the



Bonjour, je suis **BOB**, votre assistant de cours.
Je suis la pour répondre à **toutes vos questions** concernant votre formation.

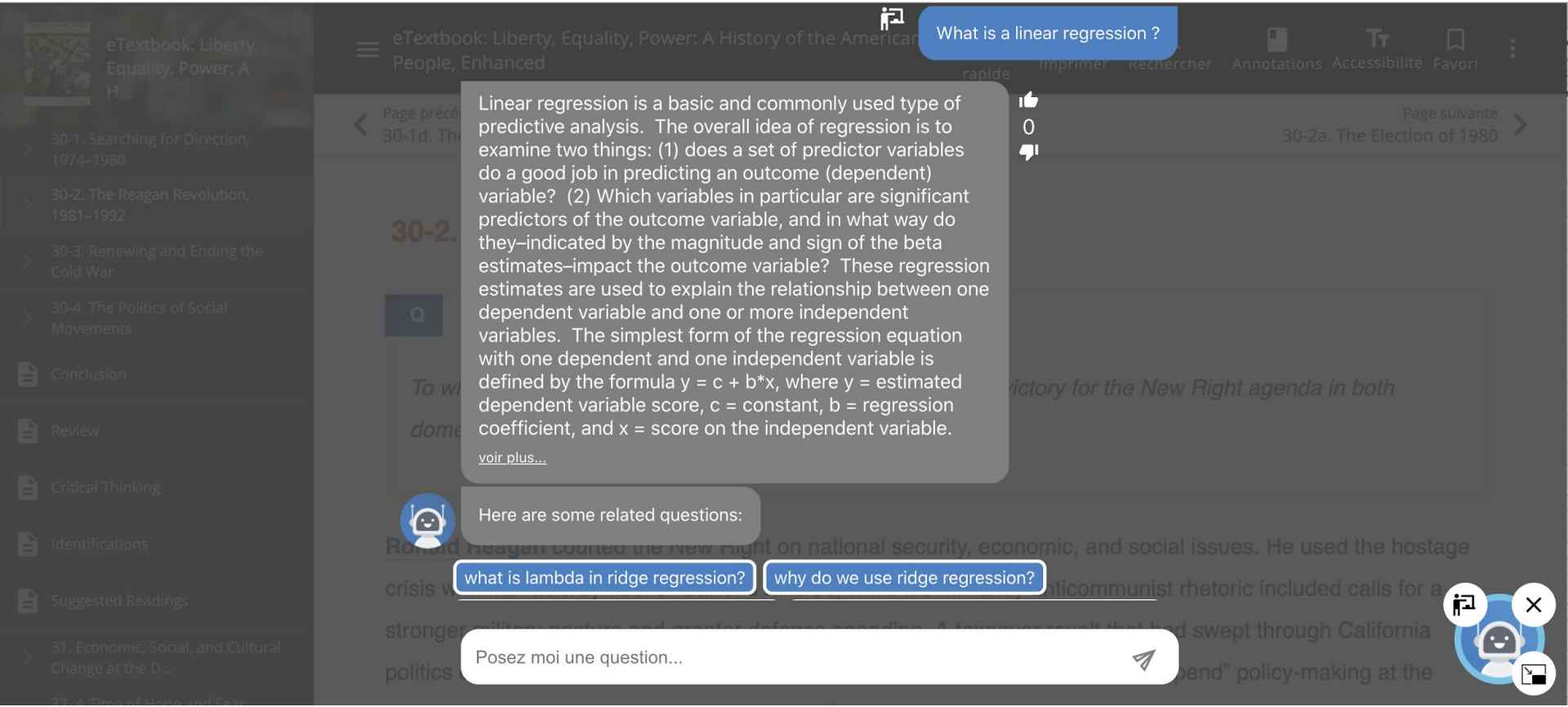
Vous pouvez par exemple me demander :

What is convolution in deep learning ?

What is a linear regression ?

When would you use a parametric test ?

En poursuivant cette opération vous autorisez au traitement de ces informations, en savoir plus


eTextbook: Liberty, Equality, Power: A History of the American People, Enhanced
What is a linear regression ?
Linear regression is a basic and commonly used type of predictive analysis. The overall idea of regression is to examine two things: (1) does a set of predictor variables do a good job in predicting an outcome (dependent) variable? (2) Which variables in particular are significant predictors of the outcome variable, and in what way do they–indicated by the magnitude and sign of the beta estimates–impact the outcome variable? These regression estimates are used to explain the relationship between one dependent variable and one or more independent variables. The simplest form of the regression equation with one dependent and one independent variable is defined by the formula y = c + b*x, where y = estimated dependent variable score, c = constant, b = regression coefficient, and x = score on the independent variable.
voir plus...
0
Here are some related questions:
what is lambda in ridge regression?
why do we use ridge regression?
Posez moi une question...

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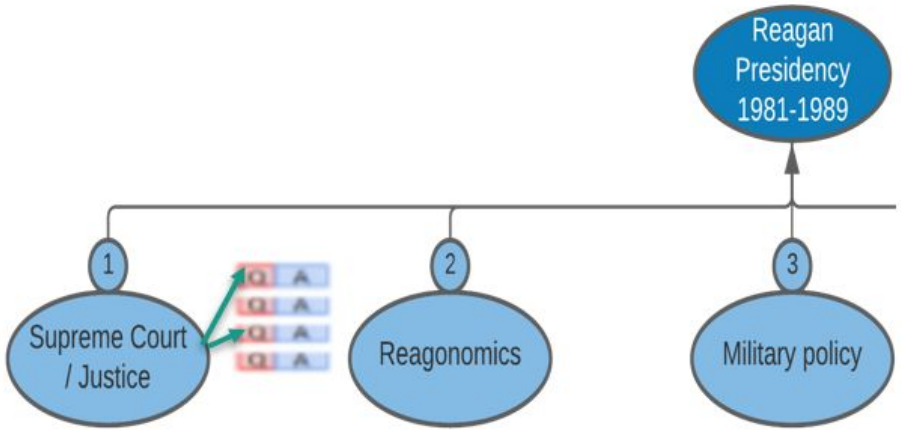
Memory anchering

Zoom on the Knowledge tree



eTextbook: Liberty, Equality, Power: A H...

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30-4. The Politics of Social Movements

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32. A Time of Hope and Fear, 1993–2018

Appendix

Aller à la Page Go

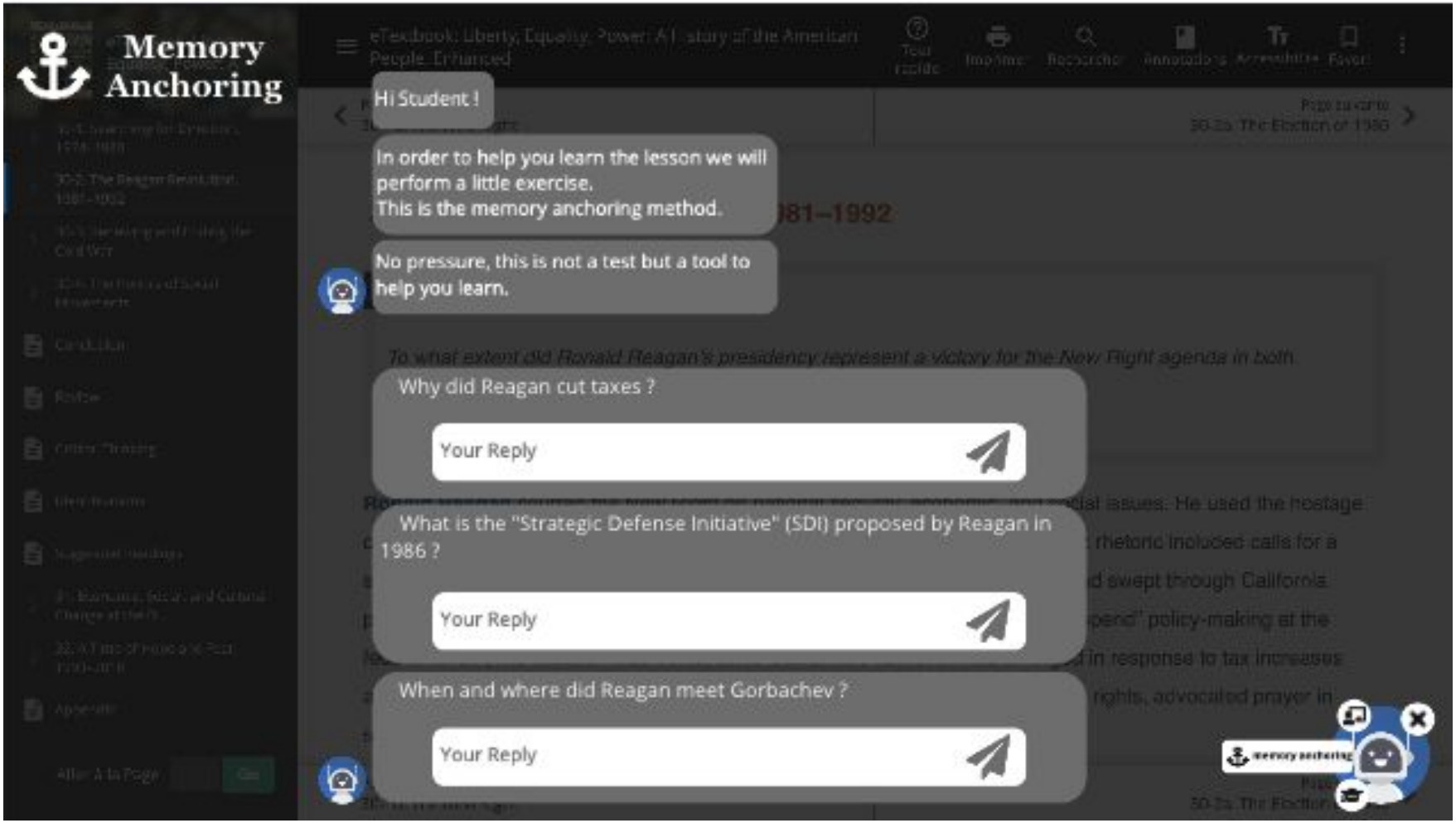
30-2. The Reagan Revolution, 1981–1992

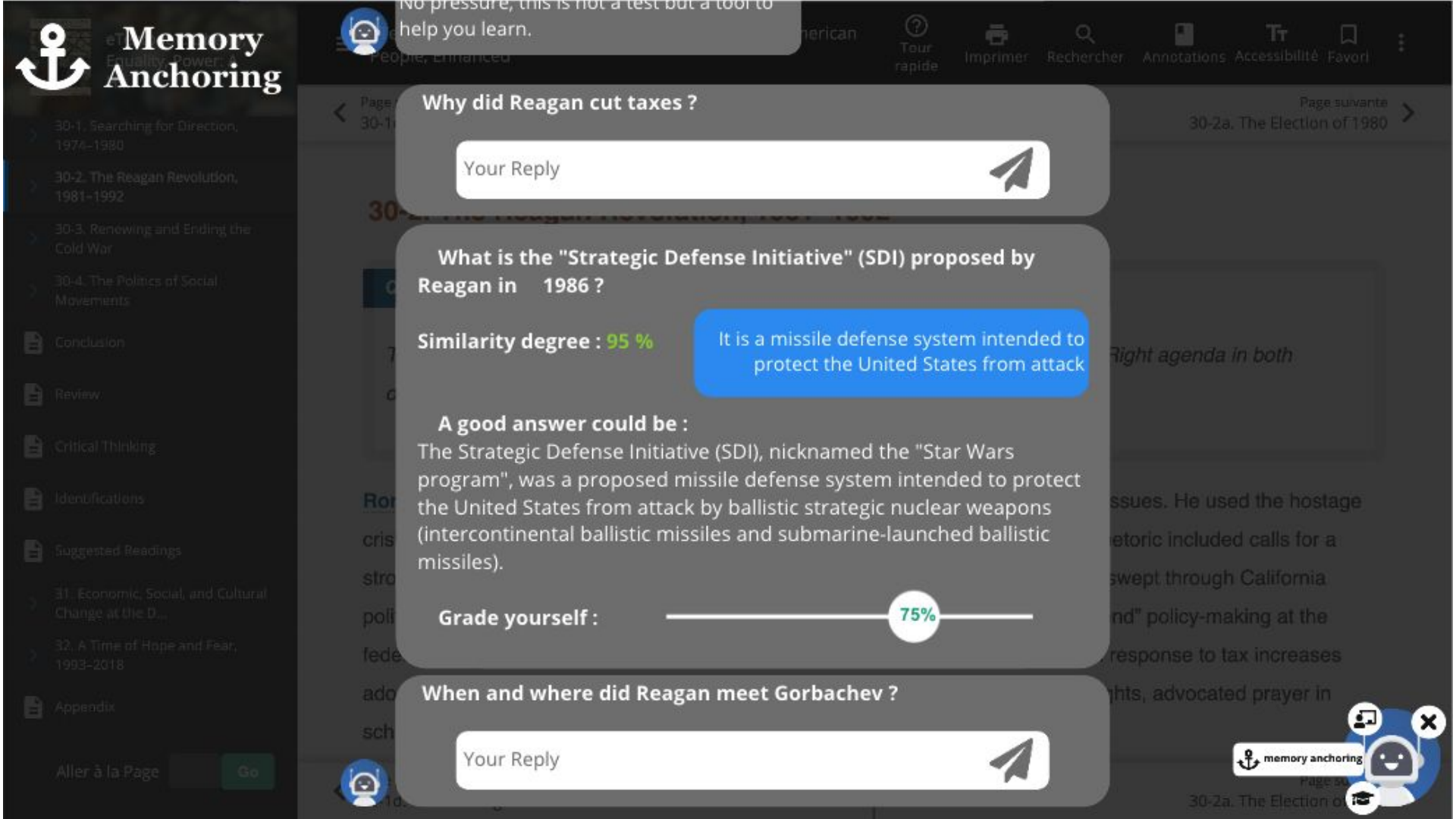
Q

To what extent did Ronald Reagan's presidency represent a victory for the New Right agenda in both domestic and foreign policy?

Ronald Reagan courted the New Right on national security, economic, and social issues. He used the hostage crisis with Iran as a symbol of Carter's failures, while his militantly anticommunist rhetoric included calls for a stronger military posture and greater defense spending. A taxpayer revolt that had swept through California politics during the late 1970s provided a model for Reagan's attack on "tax-and-spend" policy-making at the federal level. (The situation was ironic, since California's tax revolt had emerged in response to tax increases adopted while Reagan was the state's governor.) Reagan also opposed abortion right[illegible] school, and extolled conservative "family values."

I have some questions to train your memory


Memory Anchoring
Hi Student !
In order to help you learn the lesson we will perform a little exercise.
This is the memory anchoring method.
No pressure, this is not a test but a tool to help you learn.
Why did Reagan cut taxes ?
Your Reply
What is the "Strategic Defense Initiative" (SDI) proposed by Reagan in 1986 ?
Your Reply
When and where did Reagan meet Gorbachev ?
Your Reply


Memory Anchoring
No pressure, this is not a test but a tool to help you learn.
Tour rapide
Imprimer
Rechercher
Annotations
Accessibilité
Favori
30-1. Searching for Direction, 1974–1980
30-2. The Reagan Revolution, 1981–1992
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Page suivante
30-2a. The Election of 1980
Why did Reagan cut taxes ?
Your Reply
What is the "Strategic Defense Initiative" (SDI) proposed by Reagan in 1986 ?
Similarity degree : 95 %
It is a missile defense system intended to protect the United States from attack
A good answer could be :
The Strategic Defense Initiative (SDI), nicknamed the "Star Wars program", was a proposed missile defense system intended to protect the United States from attack by ballistic strategic nuclear weapons (intercontinental ballistic missiles and submarine-launched ballistic missiles).
Grade yourself :
75%
When and where did Reagan meet Gorbachev ?
Your Reply
memory anchoring

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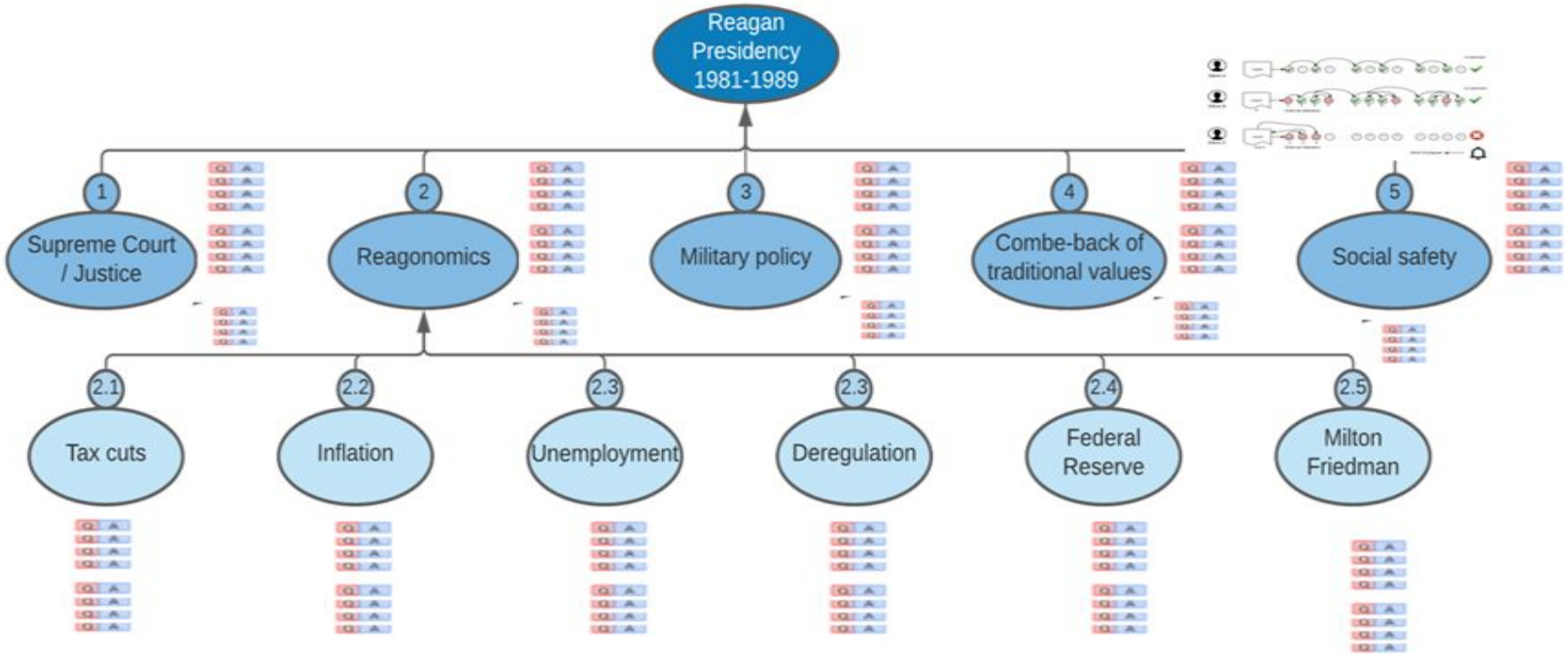
Adaptive Learning use for self-assesment



➔ **12 Q&A pairs are selected for self-assessment exercises**

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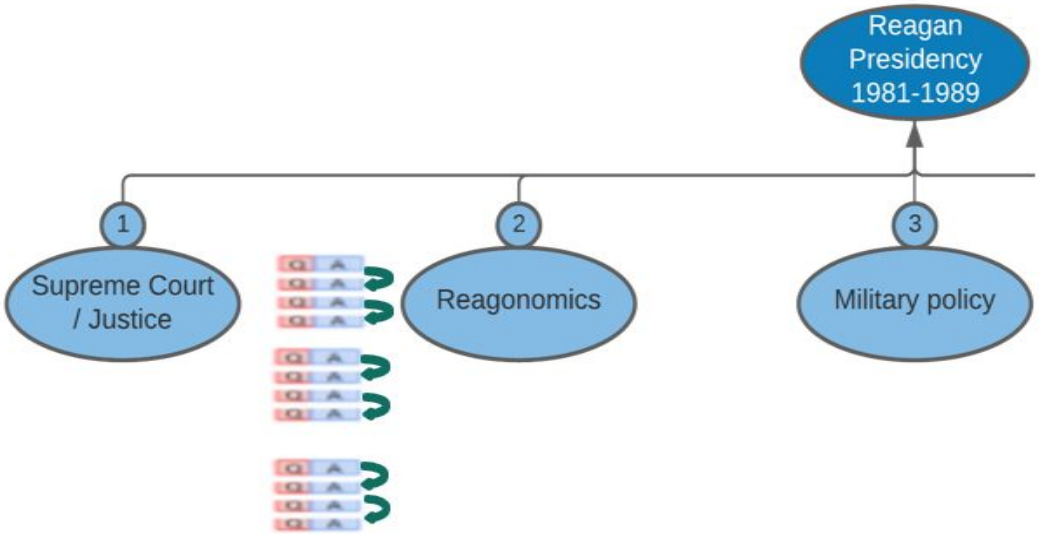
Adaptive Learning use for self-assesment Student A

Zoom on the Knowledge tree - Student A



➔ **The performance of student A is outstanding, he is learning 2x faster. Therefore, he is only solving 6 questions instead of 12.**

eTextbook: Liberty, Equality, Power: A H...

30-1. Searching for Direction, 1974–1980

30-2. The Reagan Revolution, 1981–1992

30-3. Renewing and Ending the Cold War

30-4. The Politics of Social Movements

Conclusion

Review

Critical Thinking

Identifications

Suggested Readings

31. Economic, Social, and Cultural Change at the D...

32. A Time of Hope and Fear, 1993–2018

Appendix

Aller à la Page Go

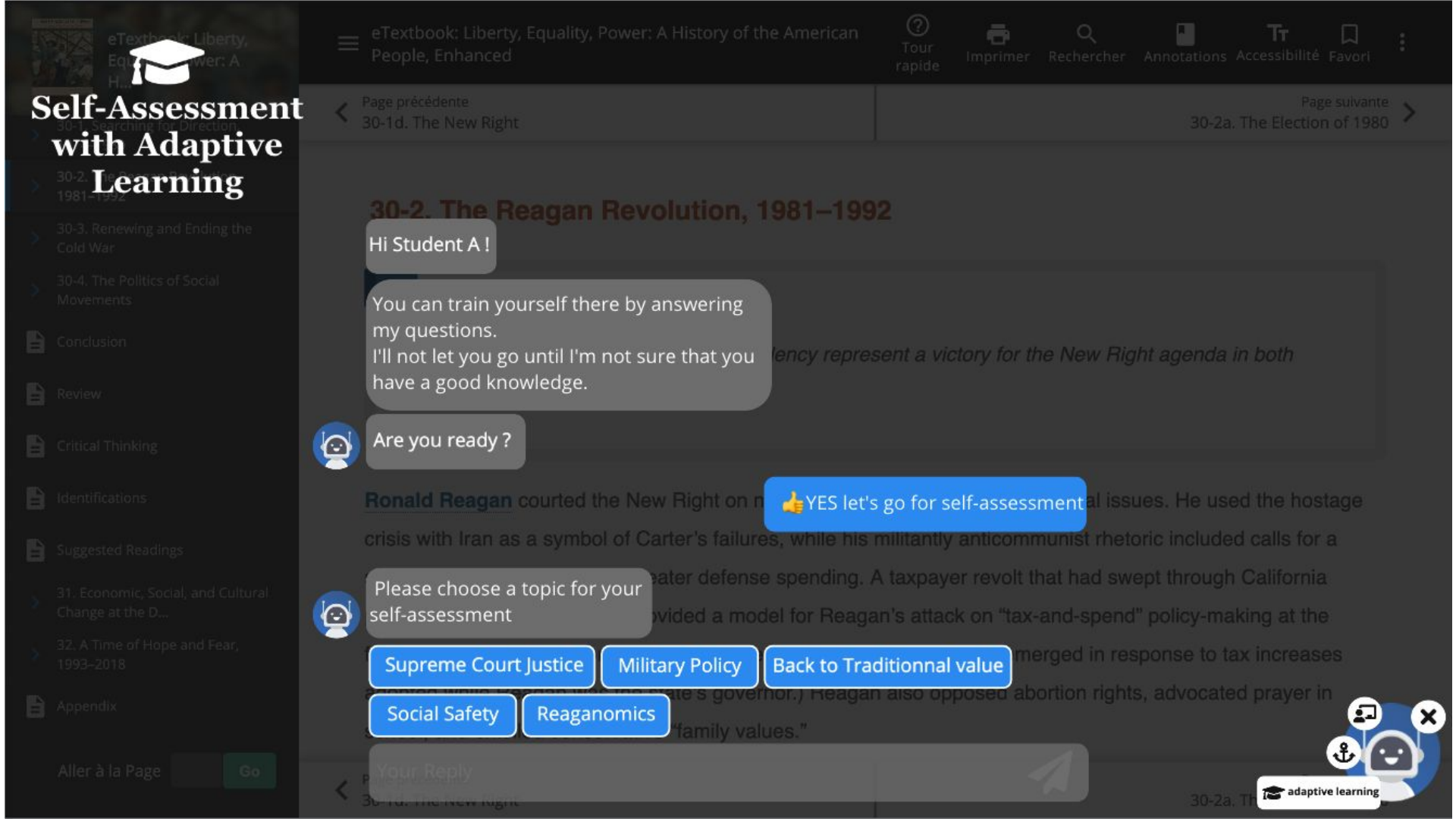
30-2. The Reagan Revolution, 1981–1992

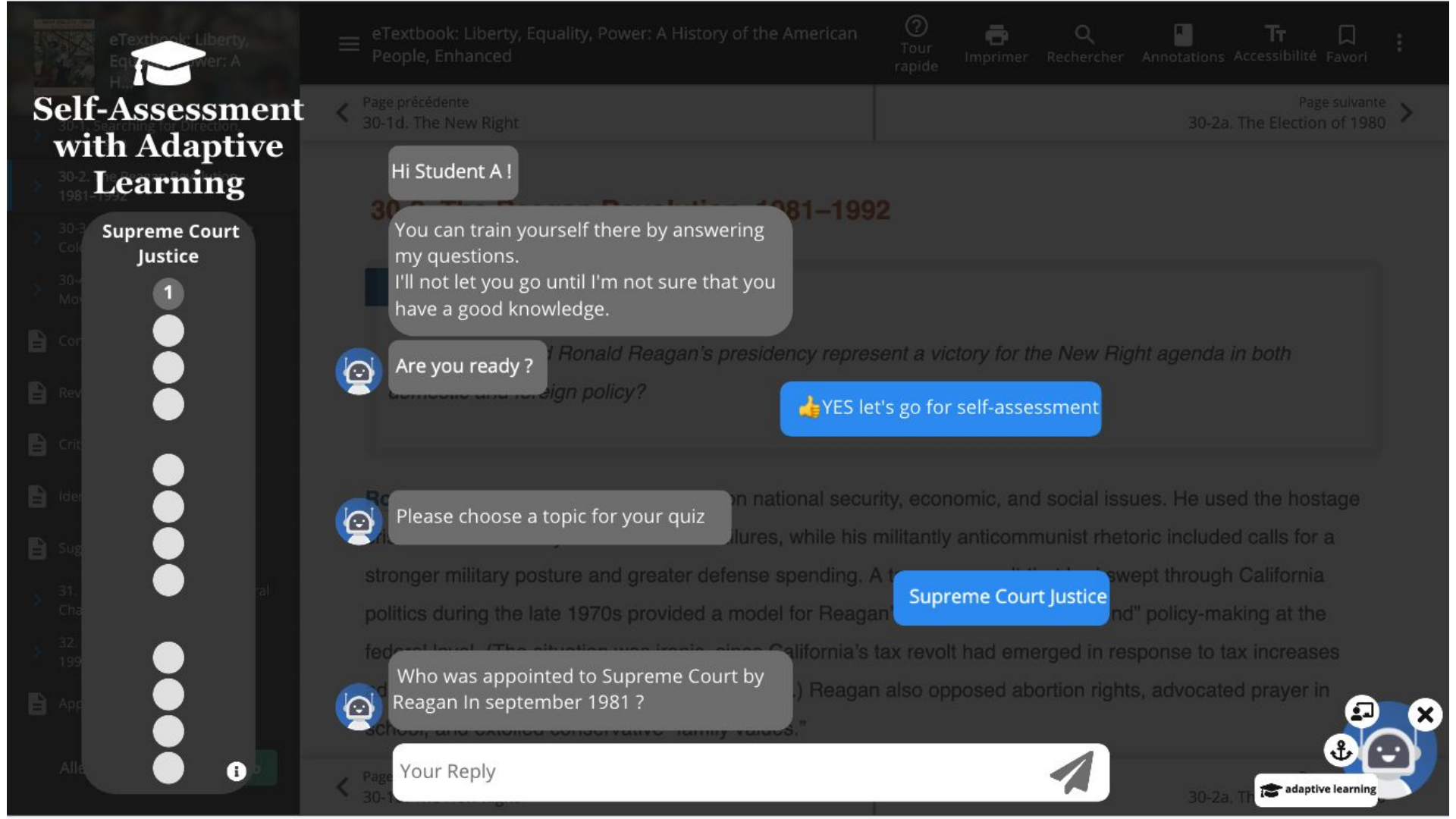
Q

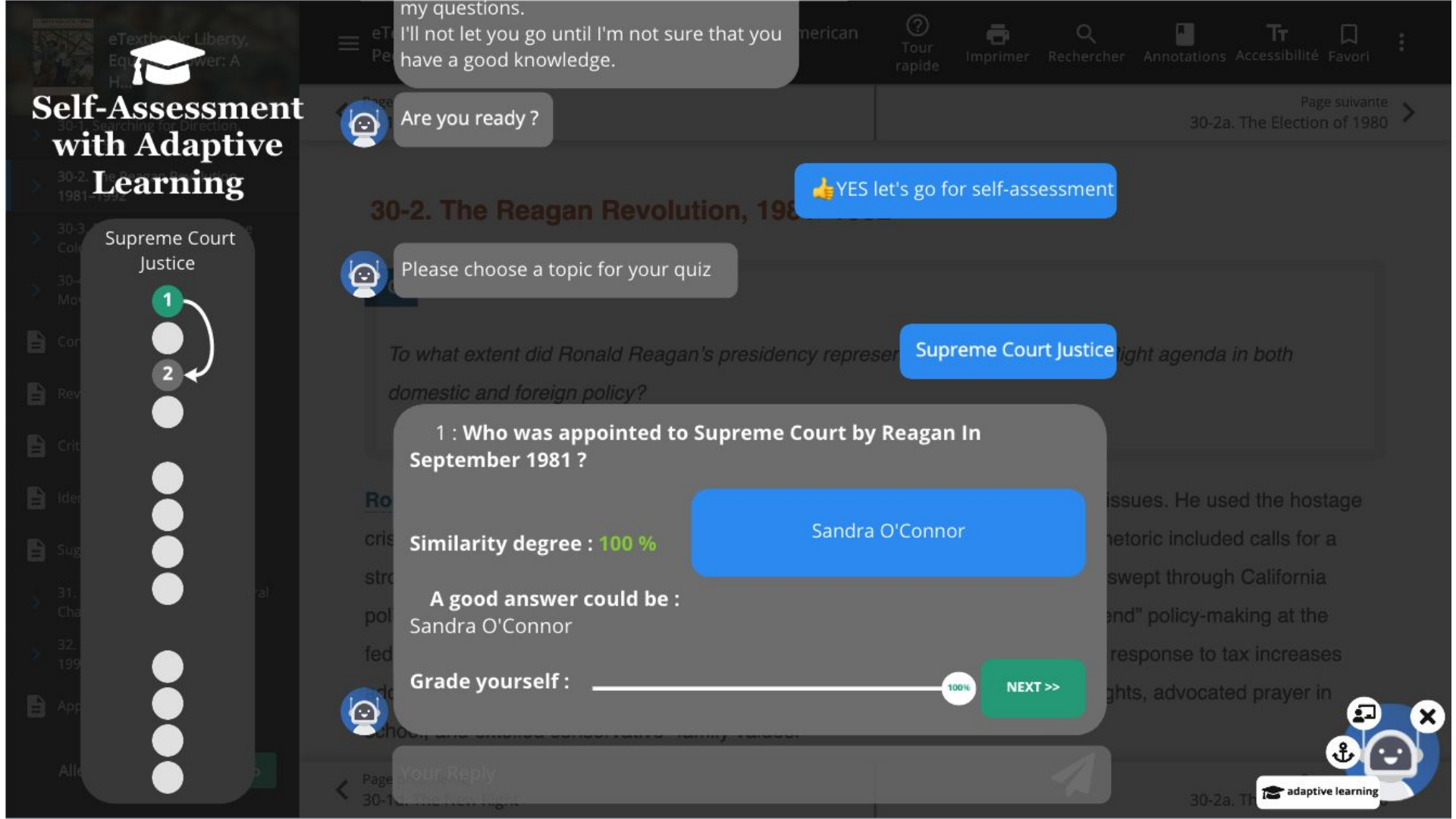
To what extent did Ronald Reagan's presidency represent a victory for the New Right agenda in both domestic and foreign policy?

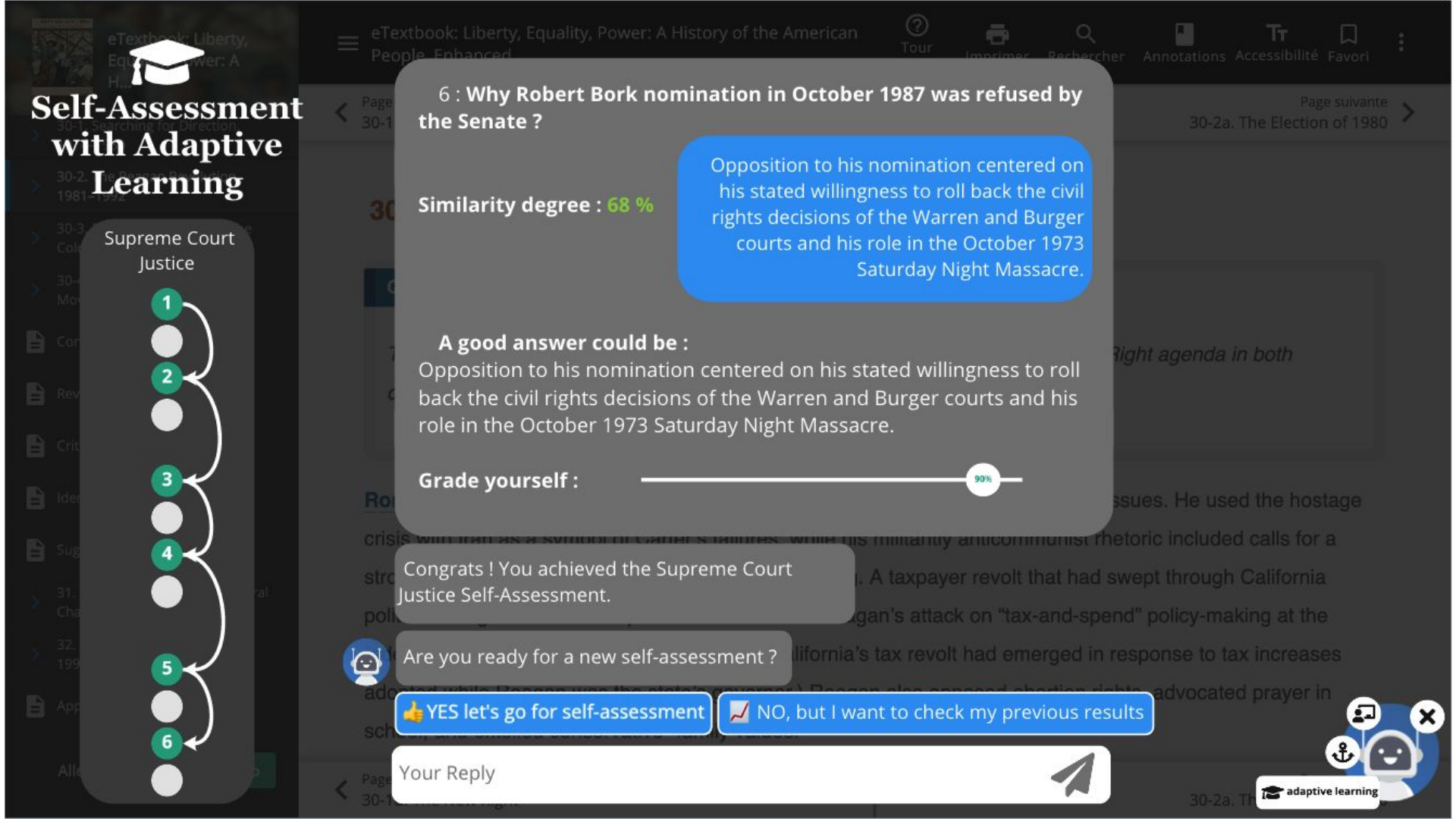
Ronald Reagan courted the New Right on national security, economic, and social issues. He used the hostage crisis with Iran as a symbol of Carter's failures, while his militantly anticommunist rhetoric included calls for a stronger military posture and greater defense spending. A taxpayer revolt that had swept through California politics during the late 1970s provided a model for Reagan's attack on "tax-and-spend" policy-making at the federal level. (The situation was ironic, since California's tax revolt had emerged in response to tax increases adopted while Reagan was the state's governor.) Reagan also opposed abortion rights, adv[illegible] school, and extolled conservative "family values."

I have a new self-assessment for you


Self-Assessment with Adaptive Learning
eTextbook: Liberty, Equality, Power: A History of the American People, Enhanced
Tour rapide
Imprimer
Rechercher
Annotations
Accessibilité
Favori
Page précédente
30-1d. The New Right
Page suivante
30-2a. The Election of 1980
30-2. The Reagan Revolution, 1981–1992
30-3. Renewing and Ending the Cold War
30-4. The Politics of Social Movements
Conclusion
Review
Critical Thinking
Identifications
Suggested Readings
31. Economic, Social, and Cultural Change at the D...
32. A Time of Hope and Fear, 1993–2018
Appendix
Aller à la Page
Go
Hi Student A !
You can train yourself there by answering my questions.
I'll not let you go until I'm not sure that you have a good knowledge.
Are you ready ?
👍YES let's go for self-assessment
Ronald Reagan courted the New Right on n
al issues. He used the hostage crisis with Iran as a symbol of Carter's failures, while his militantly anticommunist rhetoric included calls for a
ater defense spending. A taxpayer revolt that had swept through California
ovided a model for Reagan's attack on "tax-and-spend" policy-making at the
merged in response to tax increases
ate's governor.) Reagan also opposed abortion rights, advocated prayer in
family values."
Please choose a topic for your self-assessment
Supreme Court Justice
Military Policy
Back to Traditionnal value
Social Safety
Reaganomics
Your Reply
adaptive learning


Self-Assessment with Adaptive Learning
Supreme Court Justice
1
eTextbook: Liberty, Equality, Power: A History of the American People, Enhanced
Tour rapide
Imprimer
Rechercher
Annotations
Accessibilité
Favori
Page précédente
30-1d. The New Right
Page suivante
30-2a. The Election of 1980
Hi Student A !
You can train yourself there by answering my questions.
I'll not let you go until I'm not sure that you have a good knowledge.
Are you ready ?
YES let's go for self-assessment
Please choose a topic for your quiz
Supreme Court Justice
Who was appointed to Supreme Court by Reagan In september 1981 ?
Your Reply
adaptive learning


Self-Assessment with Adaptive Learning
Supreme Court Justice
1
2
my questions.
I'll not let you go until I'm not sure that you have a good knowledge.
Are you ready ?
YES let's go for self-assessment
Please choose a topic for your quiz
Supreme Court Justice
1 : Who was appointed to Supreme Court by Reagan In September 1981 ?
Similarity degree : 100 %
Sandra O'Connor
A good answer could be :
Sandra O'Connor
Grade yourself :
100%
NEXT >>
Your Reply
adaptive learning


Self-Assessment with Adaptive Learning
Supreme Court Justice
1
2
3
4
5
6
6 : Why Robert Bork nomination in October 1987 was refused by the Senate ?
Similarity degree : 68 %
Opposition to his nomination centered on his stated willingness to roll back the civil rights decisions of the Warren and Burger courts and his role in the October 1973 Saturday Night Massacre.
A good answer could be :
Opposition to his nomination centered on his stated willingness to roll back the civil rights decisions of the Warren and Burger courts and his role in the October 1973 Saturday Night Massacre.
Grade yourself :
90%
Congrats ! You achieved the Supreme Court Justice Self-Assessment.
Are you ready for a new self-assessment ?
YES let's go for self-assessment
NO, but I want to check my previous results
Your Reply
adaptive learning

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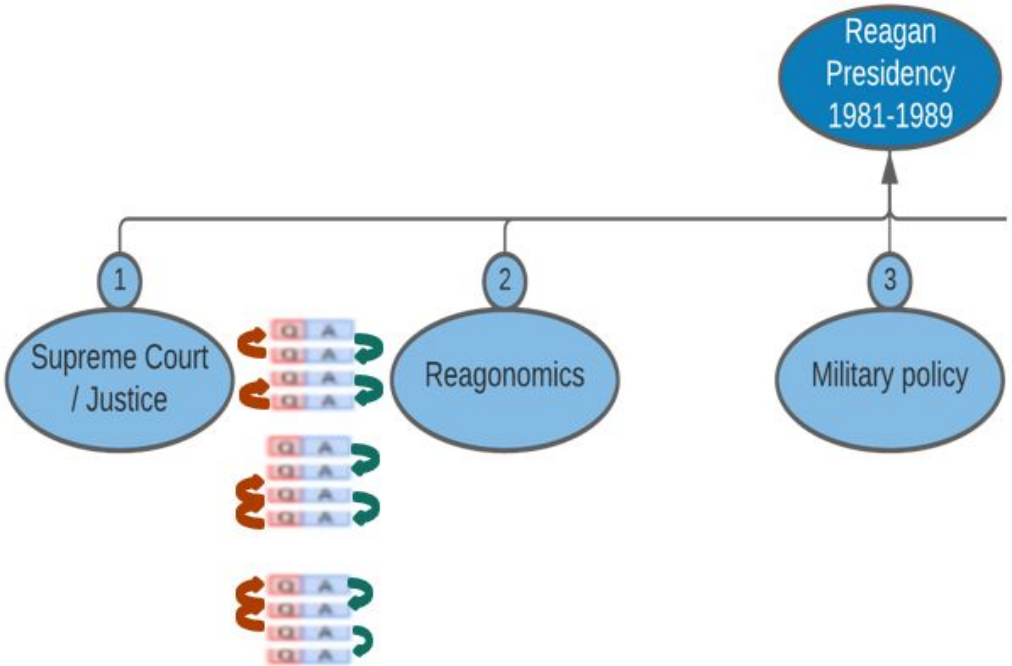
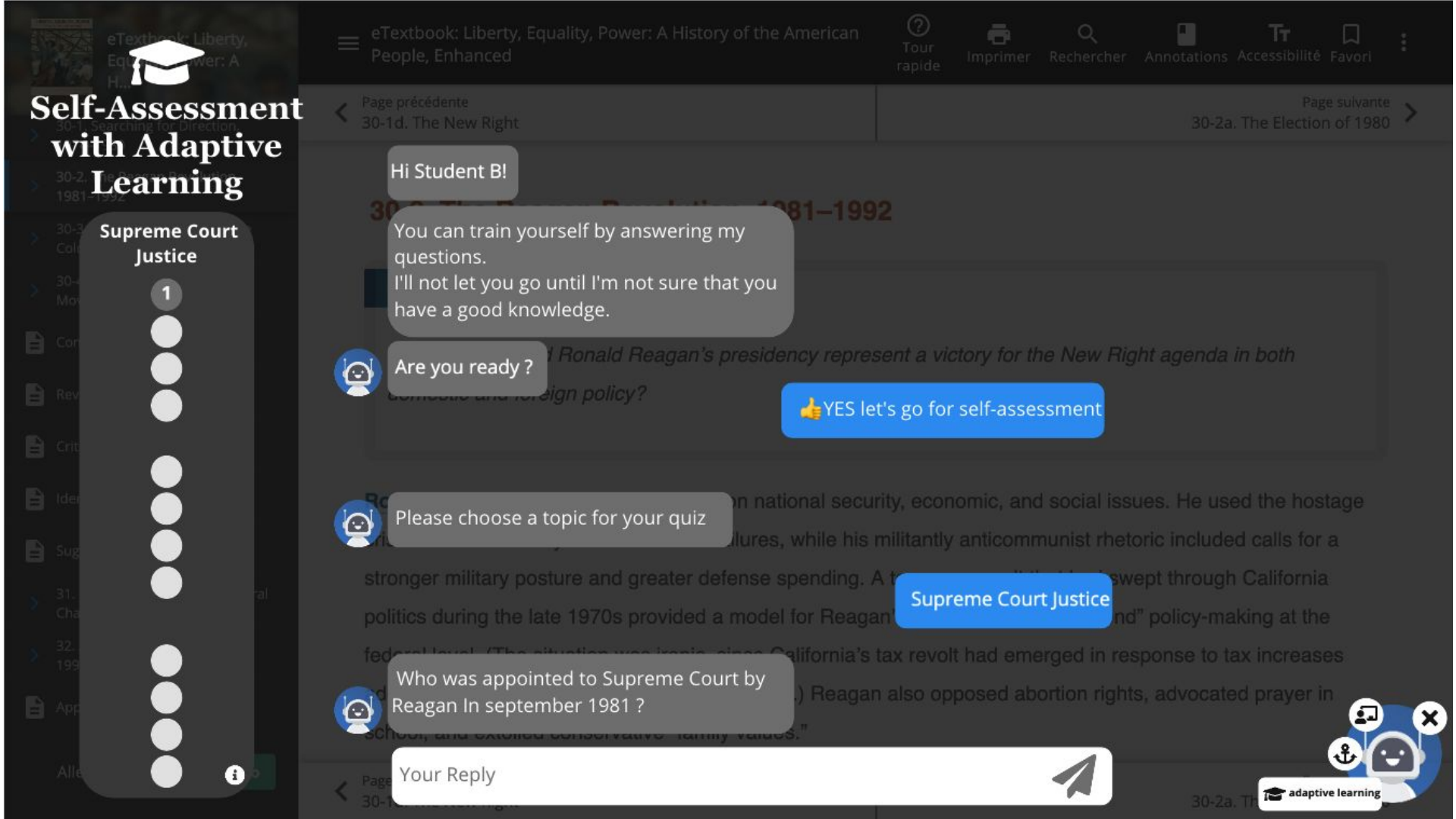
Adaptive Learning use for self-assesment Student B

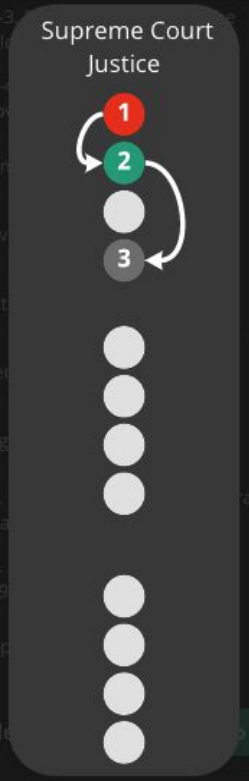
Zoom on the Knowledge tree - Student B



➔ **The performance of Student B is average, every time he answers incorrectly, he is referred back to the concept for review before moving on to the next question.**


Self-Assessment with Adaptive Learning
Supreme Court Justice
1
eTextbook: Liberty, Equality, Power: A History of the American People, Enhanced
Tour rapide
Imprimer
Rechercher
Annotations
Accessibilité
Favori
Page précédente
30-1d. The New Right
Page suivante
30-2a. The Election of 1980
Hi Student B!
You can train yourself by answering my questions.
I'll not let you go until I'm not sure that you have a good knowledge.
Are you ready ?
Ronald Reagan's presidency represent a victory for the New Right agenda in both
domestic and foreign policy?
YES let's go for self-assessment
national security, economic, and social issues. He used the hostage
lures, while his militantly anticommunist rhetoric included calls for a
stronger military posture and greater defense spending. A
swept through California
politics during the late 1970s provided a model for Reagan
nd" policy-making at the
federal level. (The situation was ironic since California's tax revolt had emerged in response to tax increases
) Reagan also opposed abortion rights, advocated prayer in
school, and extolled conservative "family values."
Please choose a topic for your quiz
Supreme Court Justice
Who was appointed to Supreme Court by Reagan In september 1981 ?
Your Reply
adaptive learning

Self-Assessment with Adaptive Learning



September 1981 ?

Similarity degree : 0 %

his uncle

A good answer could be :
Sandra O'Connor

Grade yourself : 0%

2 : **What is the role of the Supreme Court ?**

Similarity degree : 68 %

It is the highest court in the federal judiciary of the United States of America. It has ultimate (and largely discretionary) appellate jurisdiction over all federal and state court

A good answer could be :
It is the highest court in the federal judiciary of the United States of America. It has ultimate (and largely discretionary) appellate jurisdiction over all federal and state court

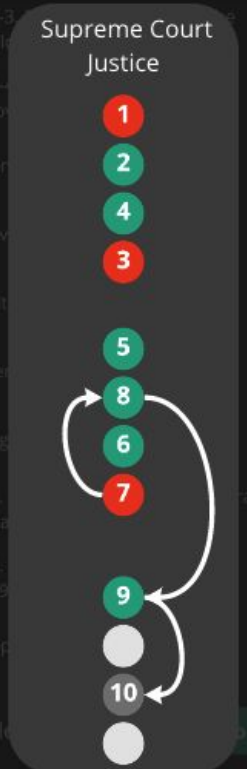
Grade yourself : 90%

NEXT >>

Your Reply

adaptive learning

Self-Assessment with Adaptive Learning



The President nominates someone for a vacancy on the Court and the Senate votes to confirm the nominee, which requires a simple majority.

Grade yourself : 90%

9 : **Why Robert Bork nomination in October 1987 was refused by the Senate ?**

Similarity degree : 68 %

Opposition to his nomination centered on his stated willingness to roll back the civil rights decisions of the Warren and Burger courts and his role in the October 1973 Saturday Night Massacre.

A good answer could be :

Opposition to his nomination centered on his stated willingness to roll back the civil rights decisions of the Warren and Burger courts and his role in the October 1973 Saturday Night Massacre.

Grade yourself : 90%

10 : What are the most famous Supreme Court judgment during Reagan presidency ?

Your Reply

adaptive learning

Modalités

-La subvention donnée est de 500 000 euros (250k ESB/ 250ke The AI Institute) pour 500 000 euros de dépenses (300 ke ESB/200 ke TAII)

-Les dépenses ESB existent déjà : 300 ke de dépenses de transformation numérique des formations

-Les dépenses The AI Institute existent déjà : 200 ke de dépense R&D

-Utilisation de la subvention de 250 Ke de l'ESB : + de formations numériques, + de ressources humaines pour y arriver

-Utilisation de la subvention de 250 ke de TAII: amélioration des algorithmes d'apprentissage adaptatif

Appel à projet IDF “Ingénierie de formations professionnelles et d’offres d’accompagnement innovante

Objectif du projet : améliorer l’apprentissage numérique à l’ESB grâce à l’IA

(40% des élèves apprennent deux fois plus vite et 90% des élèves ont un taux de mémorisation 3 fois supérieur à la moyenne)