Exploring the potential of AI to enhance mediation during L2 Dynamic Assessment

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XXVIII ANNUAL SOCIOCULTURAL THEORY AND SECOND LANGUAGE LEARNING RESEARCH WORKING GROUP MEETING

Questions/points to keep in mind

(a) What thoughts do you have regarding how mediation is conceptualized and realized in the Revita system? Limitations? Strengths? Usefulness?

(b) What potential difficulties might learner experience while using Revita? How might we prepare to address these?

(c) What recommendations do you have for how we can share outcomes of the Revita-based DA with classroom teachers?

(d) General discussion of AI and its potential as a new tool to mediate L2 development - possibilities, pitfalls? Where might this be headed and should we be excited or worried?

Outline

I. Project Background
   A. Collaboration of specialists in Diagnostic Language Assessment and Dynamic Assessment
   B. Finnish Matriculation Exam
   C. DD-LANG Project funded through Academy of Finland

II. Computerized DA (C-DA) of Matriculation Exam English Reading Comprehension
   A. Modeling reading comprehension processes
   B. Identifying difficulties with exam texts and questions
   C. Designing mediation & building in flexibility (mediation 'streams')

III. Revita: AI-Enhanced Resource to Support L2 Learning
   A. Ongoing expansion to English functionality
   B. Reading-writing nexus, points of morpho-syntax relevant for Finnish upper gymnasium learners
   C. Text input & automatically-generated exercises with prompting
   D. Tracking learner progress, sharing with teachers

IV. Discussion

I. Project Background

DD-LANG: Dynamic-diagnostic language assessment – a conceptual and practical innovation in foreign language assessment

GOAL: investigation of an integrated L2 Dynamic-Diagnostic Assessment Framework

THEORETICAL AIM: to extend previous applications of dynamic and diagnostic assessment by integrating them in a complementary manner

EMPIRICAL AIM: to investigate how combining dynamic and diagnostic assessment may **impact** learning and teaching of English in the Finnish upper secondary schools, including how students and teachers prepare for the the final Matriculation Examination (ME)
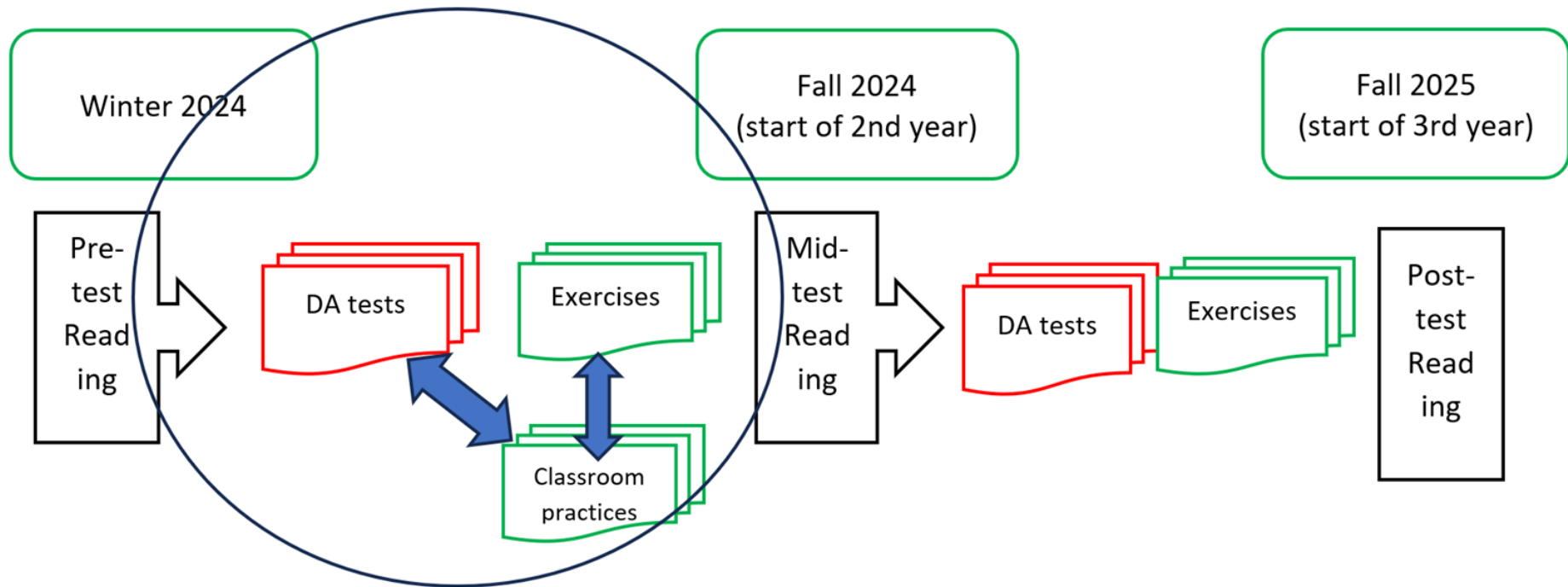
L2 Diagnostic assessment

But how?
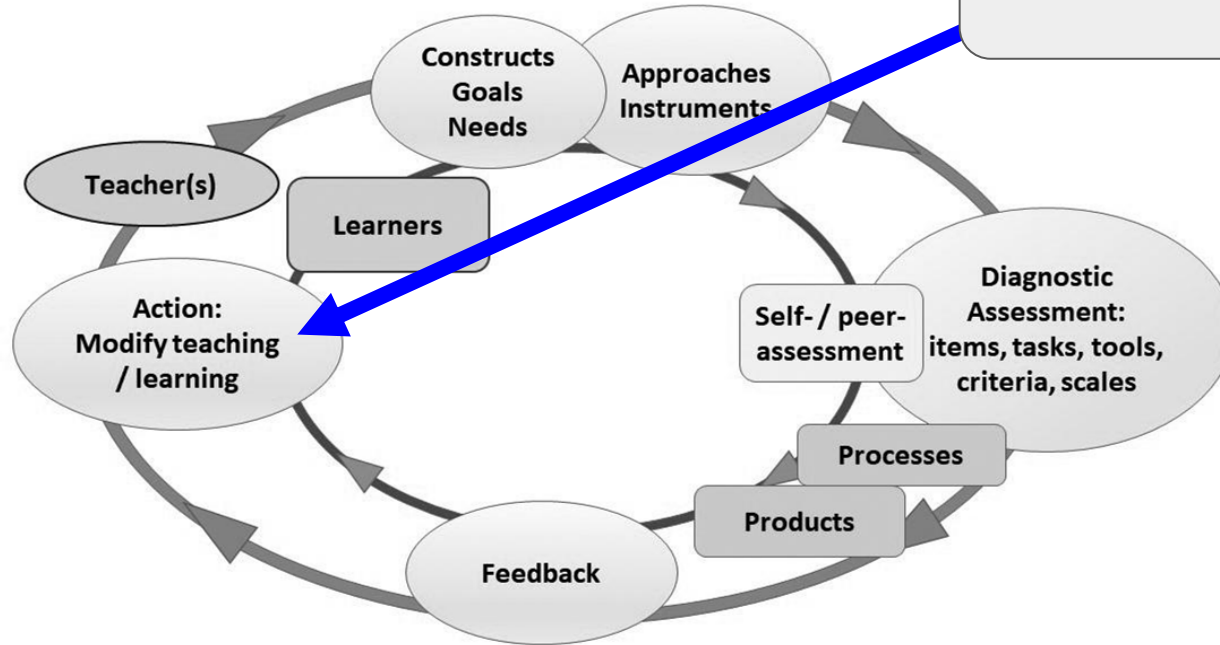
Huhta, Harsch, Leontjev, Nieminen (2023)

RESEARCH QUESTIONS

- In what ways does Finnish gymnasium (upper-secondary) students' reading and writing ability in English improve during the study? (Impact on language proficiency)
- How useful do teachers and learners find the diagnostic profiles of learner abilities that emerge from the computerized DD-LANG as they continue their ME preparation? (Impact on e.g. how reading and writing but also learning are understood)
- How, if at all, are teachers' assessment practices changed following their participation in training to use DD-LANG in the classroom? (Impact on assessment practices)
- In what ways, if any, does their experience with the DD-LANG framework alter teachers' and learners' beliefs regarding language teaching, learning, and assessment? (Impact on beliefs about the key aspects of language education)
- Based on the findings, in what ways are DA and Diag-A each enriched through the proposed integrated framework? How viable is the integrated DD-LANG framework for use in other contexts? (Theoretical contribution)

Project's main steps

Winter 2024

Fall 2024
(start of 2nd year)

Fall 2025
(start of 3rd year)

Pre-test Reading

DA tests

Exercises

Classroom practices

Mid-test Reading

DA tests

Exercises

Post-test Reading

Combine teaching with AI-based tutoring

- Broader constructs
  - Reading comprehension, inferencing, deducing vocabulary from context

- Narrower constructs
 - Grammar, discourse markers …

AI-mediated / trained

Free teacher's time and resources for more challenging activities, including use of classroom-based DA to continue to understanding learners' ripening reading comprehension abilities

- AI-enhanced Revita system does **not** replace teacher or teacher mediation → frees up teacher resources

REVITA
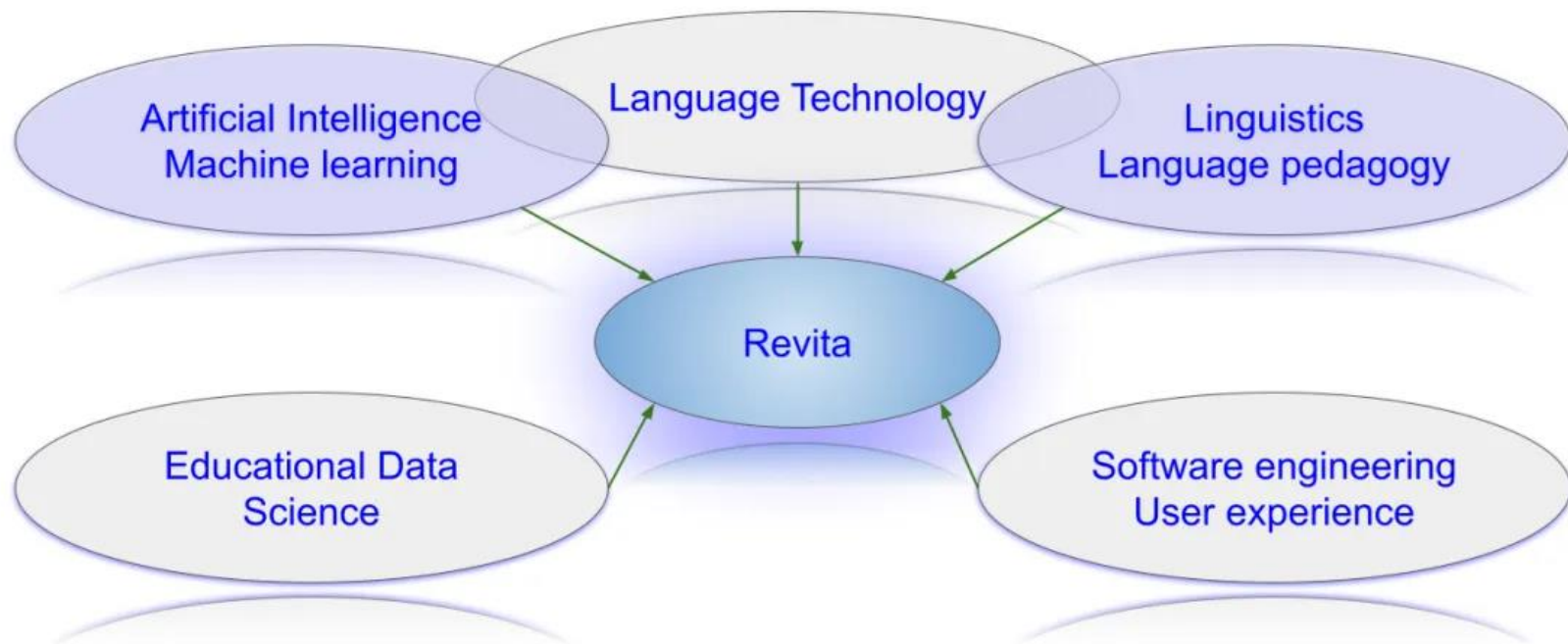
Workflow in REVITA
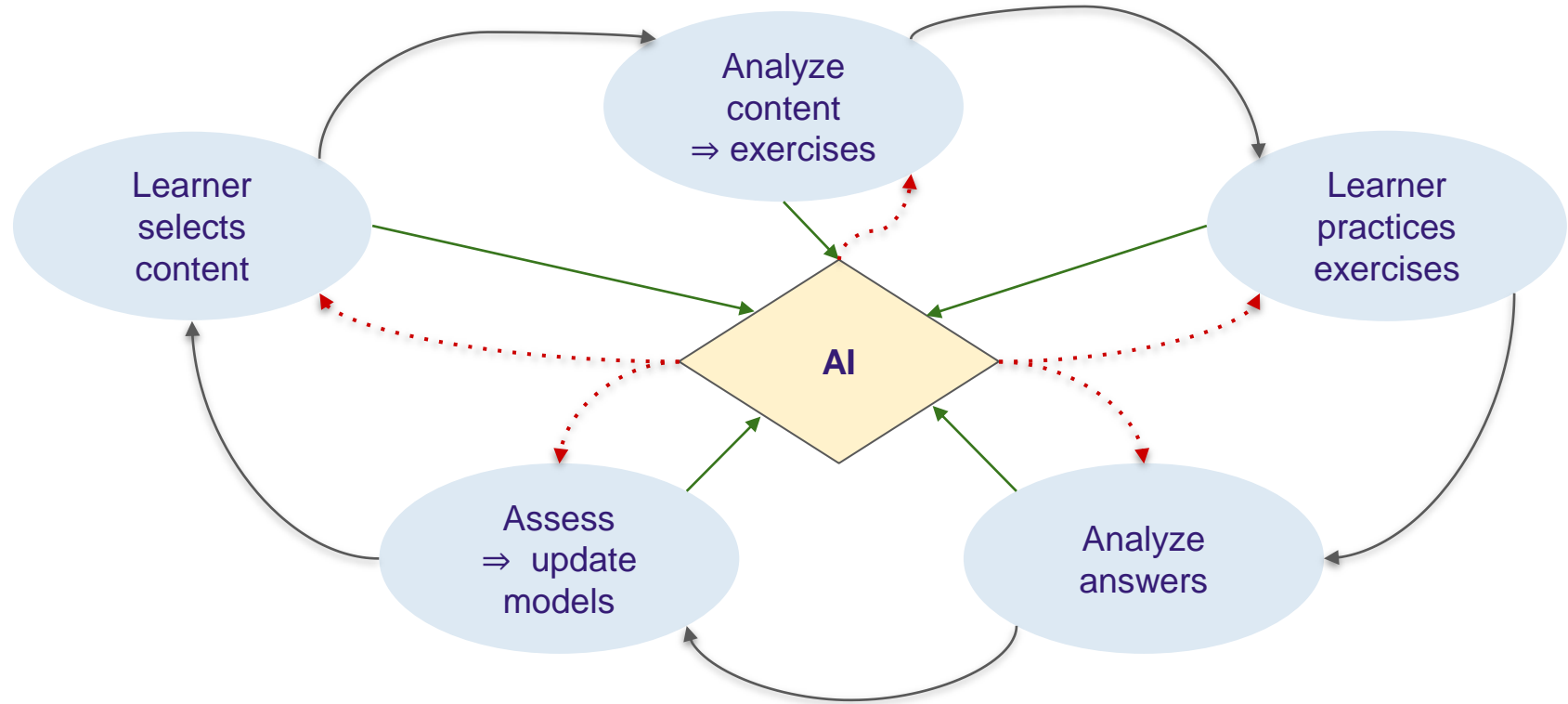
Identifying and operationalising constructs

Matriculation Examination item writers (*n* = 10) and raters (*n* = 12)

Teacher (*n* = 39) and **learner (*n* = 725) questionnaire**

Teacher interview (*n* = 4 so far)

Previous research synthesis

Think-aloud study (*n* = 5)

- Finding the main idea of the text — 37%
- Reading between the lines — 45%
- Connecting information from different text parts — 30%
- Understanding separate details in the text — 40%
- Understanding the meaning of key words — 29%
- Understanding grammatical and sentence structures — 15%
- Deducing the meaning of unknown words from the context — 42%
- Combining information in text with images or graphs — 15%
- Background knowledge — 29%
- Translation between English and Finnish (or Swedish). — 24%
- Answering in Finnish — 9%
- Other — 7%
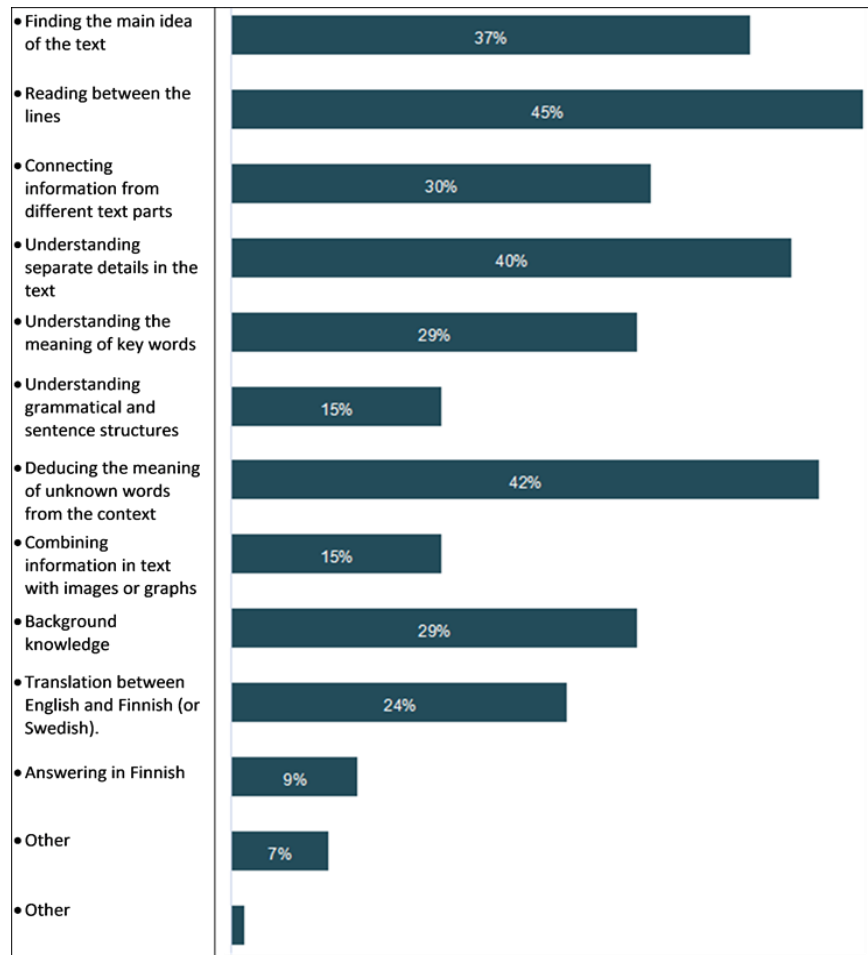- Other

Identifying and operationalising constructs (1)

Matriculation Examination item writers ($n = 10$) and raters ($n = 12$)

Teacher ($n = 39$) and learner ($n = 725$) questionnaire

Teacher interview ($n = 4$ so far)

Previous research synthesis

Think-aloud study ($n = 5$)

T4: So you basically **you have to rely on what you read and the information that you get**… Usually I would say that well if there is a title, **the title usually tells you the main things** or something. This sounds t**his is very sort of an advertising** like title in my opinion. Lots of **abbreviations**. Maybe they, maybe some of them are sort of **understandable from the context**… I guess, I don't know. I guess you could say that. Well, have a look at the verbs… Like, particularly there to these two words, which are **incumbent** in an **upstart**

Identifying and operationalising constructs (2)

Matriculation Examination item writers (n = 10) and raters (n = 12)

Teacher (n = 39) and learner (n = 725) questionnaire

Teacher interview (n = 4 so far)

Previous research synthesis

Think-aloud study (n = 5)

Grabe and Iwashita (2022) on deducing vocabulary: a strategy that is helpful in maintaining comprehension when there is no better way of determining the meaning of a keyword. "help reader continue reading without major interruption" They discuss it as a voc. learning strategy: "the most useful clues are in the immediate context of the word." Useful clues they mention: **discourse markers**, **punctuation**, **word-part information**, **part of speech**, **examples**, **descriptions**, **associational relationships** - synonyms, antonyms, keywords in the same clause.

Think-aloud study (n = 5)
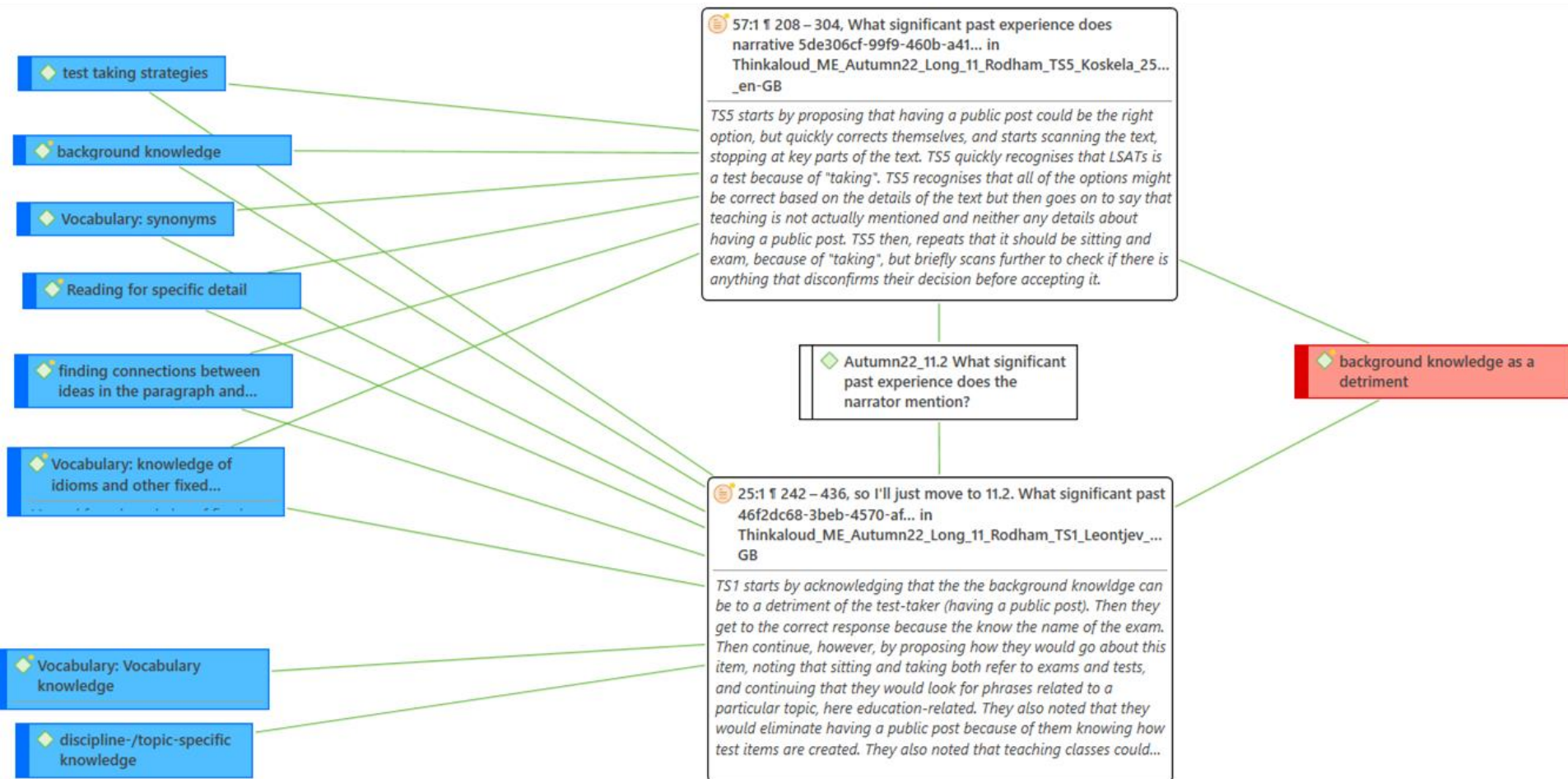
II. Computerized DA (C-DA) of Matriculation Exam English Reading Comprehension

Exemplar Text & Item From Matriculation

What is mentioned as a difference between GM and Tesla?

a)   GM is thought to focus on petrol engines
b)   GM has a more established position
c)   GM's reputation is more disputed
d)   GM will decide the future of the industry
e)   GM keeps fighting fellow incumbents

10.A Text: Ford's New All-Electric F-150 Lightning Is More Than It Seems

While driving around suburban Houston during Texas' power crisis in February 2021, which left millions without power for days, Ford energy services lead Ryan O'Gorman was thinking less about that disaster than the next one. Ford at the time was putting the finishing touches on an all-electric version of its best-selling F-150 pickup, with a nifty feature for just such an emergency: in a power outage, the truck would be able to function as a backup battery, powering an owner's house for days. "I can't tell you how many F-150s I saw parked in driveways while I was driving around Texas during that week," says O'Gorman.

The F-150 Lightning is the latest offering in Ford's $22 billion electric vehicle (EV) push. It's also a huge deal for the company which is fighting both fellow incumbents (like GM) and highly-valued upstarts (like Tesla and Rivian) for what analysts say will at least at first be a limited electric market but is likely to be the future of the auto industry. "We just absolutely think there's going to be a big shake out," Ryan O'Gorman told TIME of the EV market. "There're going to be clear winners and losers, and the pecking order of the industry is going to change."

Exemplar Mediation Stream I: Deducing Vocabulary

1) One strategy that can help you when you encounter words you don't know is to circle them but continue reading the rest of the sentence or paragraph. You can then go back to the words and ask yourself if you are able to understand what you have read without knowing each word. If you have a general understanding of what you have read, does this help you figure out what the unknown words might mean?

2) Sometimes knowing the part of speech, or how an unknown word functions in a sentence, can give us a clue to its meaning. For example, we can ask, is it a word that seems to describe another word? If it is an adjective, what kind of description could be intended?

3) We can also figure out the meaning of unknown words by looking at how ideas within a sentence or how multiple sentences themselves are connected. For example, saying "for example" means that a more general idea is going to be explained or illustrated with a specific case. The word "however" sets up a contrast or difference between two ideas. "Because" tells us that a reason is going to be given.

4) To find the answer to this question, you should think how GM and Tesla are compared to Ford (and what kind of company Ford is). Words like "fellow" tell us about GM in relation to Ford. Also "both... and..." signals that GM is a company like Ford whereas Tesla is different.

Synthesis: The correct answer is **GM has a more established position**
there are many things in the text than can help you figure out the meanings of unknown words: title and headings, pictures, and keywords can help you understand the general idea of the text. So you can always start reading the text by looking at these elements. You can also try to read the entire text or paragraph or sentence and then, once you have an overall understanding, you can return to unknown words to try to figure out what they might mean. Another strategy is to ask how the unknown word seems to be functioning in the text (what part of speech it is). You can also look at the text around the words you don't know paying attention to, for example, linking words and think about what they tell us about how the pieces of information are related. You can also look at the words that can give a better understanding of unknown words, for example adjectives.

Exemplar Mediation Stream II: Activating Background Knowledge

1) You may already know some things about the topic that can help you understand the text and answer the question. Ask yourself what the general topic of this text seems to be. Then call to mind what you already know about this topic.

2) There are several things that can help you understand what the text is about. You can, for example, look at the title, pictures, and headings. You can also look for vocabulary that you think relates to a specific topic. What do you think the main topic is?

3) List some of the points that you know about the topic either on paper or in your mind that could help you find the answer to this question. Is there information in the text that confirms or adds to what you already know? Is there information that contradicts or is in contrast to what you know?

4) To find the answer to this question, you should think about how GM and Tesla are compared to Ford (and what kind of company Ford is). Your background knowledge can help you to compare them. Also, some other text details, such as the word "fellow" or the linking words, such as "both... and" can help you recognise how the three companies are compared.

Synthesis: The correct answer is **GM has a more established position**
Your background knowledge can sometimes help you understand the text. Some text elements, such as title, pictures, headings and keywords can help you figure out the text topic. You can then think what you know about the topic that can help you understand the text. Background knowledge should not be the only thing you use when understanding the text. Many texts contain new information some of which may even contradict common assumptions about the topic. So pay attention to also other text elements.

III. Revita: AI-Enhanced Resource to Support L2 Learning

Creating automatic exercises with mediation

11.A Text: Rodham

There was a feeling I got before I spoke in front of an audience and sometimes also before an event that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, which I'd done in a classroom on the campus of Harvard. The feeling was a focused kind of anticipation, it was like a weight inside my chest, but it never exactly came from being nervous. I always had prepared, and I always knew I could do it. Thus the feeling was a sense of my own competence blended with the knowledge that I was about to pull off a feat most people thought, correctly or not, they couldn't. And this knowledge contributed to the final aspect of the feeling, which was loneliness – the loneliness of being good at something.
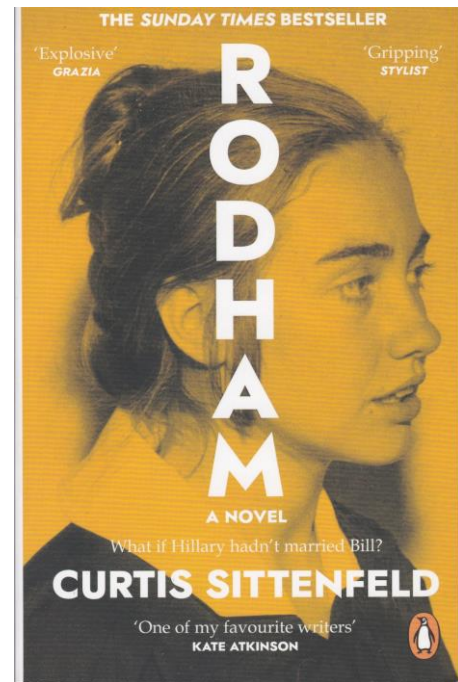
Discourse markers

There was a feeling I got before I spoke in front of an audience and sometimes also before an event that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, therefore I _____ in a classroom on the campus of Harvard.

Check

Next snippet

therefore
unlike
which
whom

Report a problem

Discourse markers

- How does the missing word connect to what comes before and after it?

Home   Library   Lessons   Flashcards   Groups

- How does the missing word connect what comes before it and after it?

You used: unlike

Rodham

Highli

There was a feel[...]ll important, an event that could have consequences in my life – taking the LSATs, for example, **unlike** I did in a classroom on the campus of Harvard.

Discourse markers

Home   Library   Lessons   Flashcards   Groups

- How does the missing word connect what comes before it and after it?
- Words like this can show different relationships between the text parts they connect.
These words might offer an example of something or set up a comparison or a contrast.
What kind of relationship makes sense here? Does this give you a clue about the word that might fit best?

You used: whom

Rodham

Highli

There was a feel... ll important, an event that could have consequences in my life – taking the LSATs, for example, whom I did in a classroom on the campus of Harvard.

Discourse markers

Home   Library   Lessons   Flashcards   Groups

Rodham

Highli...

- How does the missing word connect what comes before it and after it?
- Words like this can show different relationships between the text parts they connect.
These words might offer an example of something or set up a comparison or a contrast.
What kind of relationship makes sense here? Does this give you a clue about the word that might fit best?
- This word signals that what follows it gives more information about the preceding part.
Sometimes you also need to check if it fits grammatically.

You used: therefore

There was a feeli... ll important, an event that could have consequences in my life – taking the LSATs, for example, which I did in a classroom on the campus of Harvard.

Tenses

Rodham

[●━━] Highlight exercise difficulty

There was a feeling I got before I spoke in front of an audience and sometimes also before an event that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, [_ _ _ _ ▼] I [will do ▼] in a classroom on the campus of Harvard.

| will do |
| am doing |
| did |
| was done |

Check Answers

Next snippet ↧

🚩 Report a problem

Tenses

Rodham

🔵 Highlight exercise difficulty

There was a feeling I got before I spoke in front of an audience and sometimes also b... ...vent that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, which I will do in a classroom on the campus of Harvard.

- Does the narrator refer to the past, the present , or the future? What in the text can help you find out?

You used: will do

Tenses

Rodham

🔵 Highlight exercise difficulty

There was a feeling I got before I spoke in front of an audience and sometimes also b_____ an event that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, which I was done in a classroom on the campus of Harvard.

- Does the narrator refer to the past, the present , or the future? What in the text can help you find out?
- Find other verbs in this sentence.
Do they refer to the past, present, or future.
What does this tell you about the verb tense that we likely need here?

You used: was done

Tenses

- ...
- ....
- The narrator is describing events that occurred in the past. A past tense verb is needed here. Thus, the correct answer is 'did', a past tense form of the verb 'to do.' The form 'will do' refers to a future action while 'am doing' indicates the action is currently taking place and 'was done' suggests that the action had already been completed at an earlier point in the past. Remember that selecting an appropriate verb tense involves understanding how different events or actions are being connected to one another in time.

Rodham

[●——] Highlight exercise difficulty

There was a feeling I got before I spoke in front of an audience and so... also before an event that was less public but still important, an event that could have consequences in my life – taking the LSATs, for example, which I did in a classroom on the campus of Harvard.

- Does the narrator refer to the past, the present , or the future? What in the text can help you find out?
- Find other verbs in this sentence.

Do they refer to the past, present, or future.

What does this tell you about the verb tense that we likely need here?

- The narrator is describing events that occurred in the past.

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Thus, the correct answer is 'did', a past tense form of the verb 'to do.'

' The form 'will do' refers to a future action while 'am doing' indicates the action is currently taking place and 'was done' suggests that the action had already been completed at an earlier point in the past.

Remember that selecting an appropriate verb tense involves understanding how different events or actions are being connected to one another in time.

You used: am doing

Using DD-LANG information in the classroom

- praxis with teachers
- teacher training in the use of DA
- information teachers receive about their learners

IV. Discussion

Questions

(a) What thoughts do you have regarding how mediation is conceptualized and realized in the Revita system? Limitations? Strengths? Usefulness?

(b) What potential difficulties might learner experience while using Revita? How might we prepare to address these?

(c) What recommendations do you have for how we can share outcomes of the Revita-based DA with classroom teachers?

(d) General discussion of AI and its potential as a new tool to mediate L2 development - possibilities, pitfalls? Where might this be headed and should we be excited or worried?

Other comments, observations, etc.

Kiitos!
Thank you!

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