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Area of discussion - Universities of the Future: Knowledge, Talent, and Global Mobility Ecosystems

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DESIGN AND EVALUATION OF INCLUSIVE ONLINE COURSES FOR OPEN DIGITAL ECOSYSTEM OF CONTEMPORARY UNIVERSITY

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Outline of the Presentation

1. **The urgency and purpose of the research**
2. **Theoretical framework of the research:** concept of Universal Design for Learning (UDL) and the requirements for quality online courses as the components of university inclusive ecosystem.
3. **Results, Piloting and discussion.**

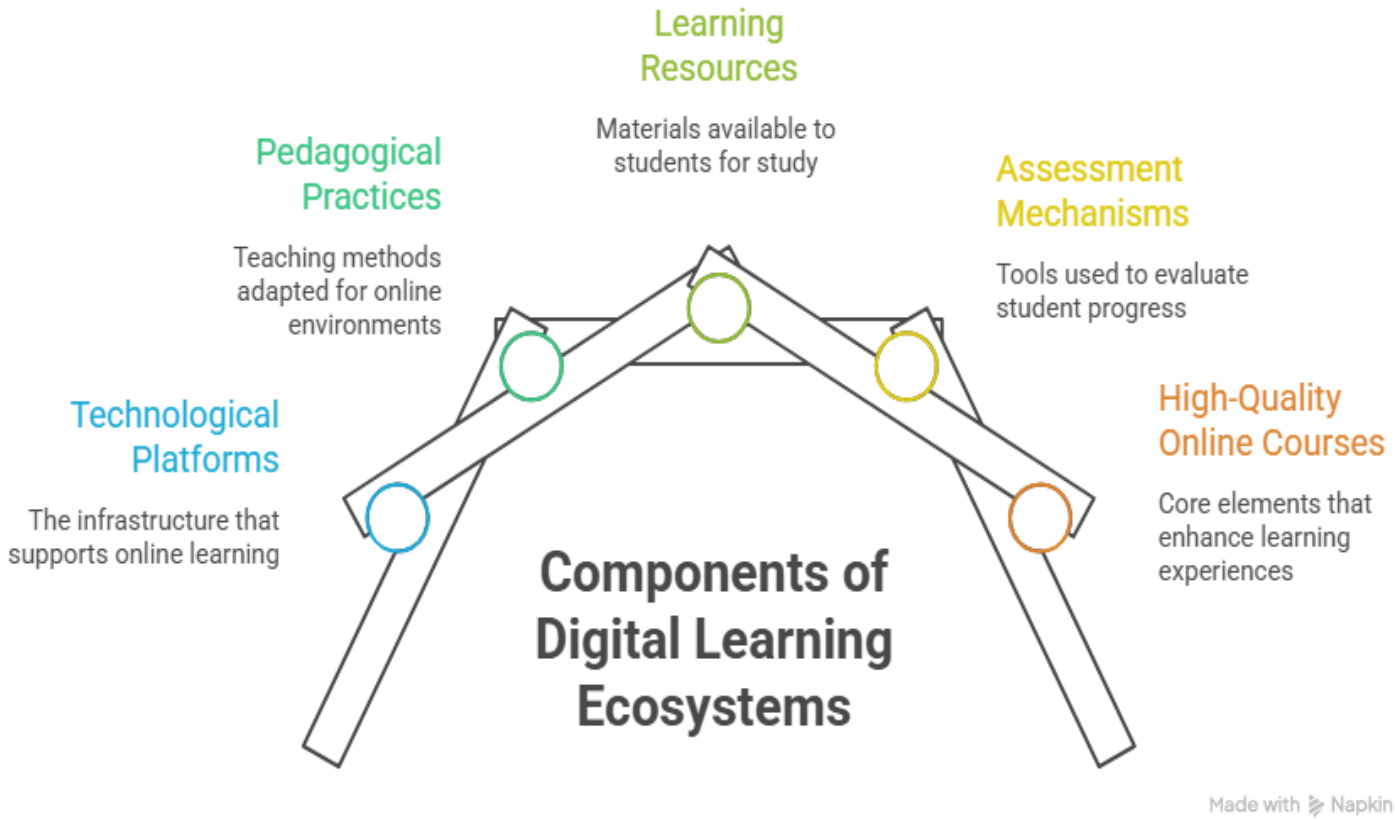
The urgency of the research

In the context of the 21st-century digital transformation,
universities increasingly rely on online and blended learning
to fulfill their educational mission and respond to students' diversity.

The urgency of the research

Digital learning environments have become a core component of the digital ecosystem of universities.

The said ecosystems encompass:
technological platforms
pedagogical practices,
learning resources,
assessment mechanisms
that collectively influence students' learning experiences.



High-quality online courses are seen as core building blocks of such ecosystems: they
- mediate access to knowledge,
- support personalization of learning paths,
- shape institutional effectiveness in meeting diverse learners' needs.

The urgency of the research

Recent literature analysis reveals:
while online learning has the potential to meet the needs of diverse learners (for instance, by providing flexibility and organized access to materials),
there are significant gaps in how well online courses address accessibility and inclusivity for all students, especially those with disabilities or learning differences.

The urgency of the research

The Universal Design for Learning (UDL) framework has emerged as a pedagogically grounded approach that supports inclusive course design.

UDL advocates for the systematic planning of curriculum, instruction, and assessment grounded **in three core principles**:
multiple means of representation,
multiple means of action and expression,
multiple means of engagement

corresponding to the recognition, strategic, and affective neural systems involved in learning.

The urgency of the research

Thus, **the needs for relevant assessment tools, aligned with UDL principles** and capable of evaluating inclusive course quality, has become both urgent and essential.

These tools are necessary not only to certify that online courses meet minimum accessibility standards.
They should **ensure that the courses meaningfully support learners' engagement, autonomy, and equitable achievement**,
which make the goals of international policy on inclusive education.

The objectives of the research

(1) to determine the coordination of the requirements to online courses and their consistency with UDL principles;

(2) to develop appropriate criteria support allowing to assess the quality of implementation of UDL principles in the design of inclusive online courses;

(3) to specify a structured procedure for pedagogical expertise of inclusive online courses as integral components of a university's digital ecosystem.

The theoretical framework of the research

(1) The concept of UDL and its principles

(2) The requirements for quality online courses

(3) Frameworks for their quality certification

1. The concept of UDL and its urgency for the realization of the education accessibility

UDL is recognized as a scientifically valid framework for guiding educational practice that:

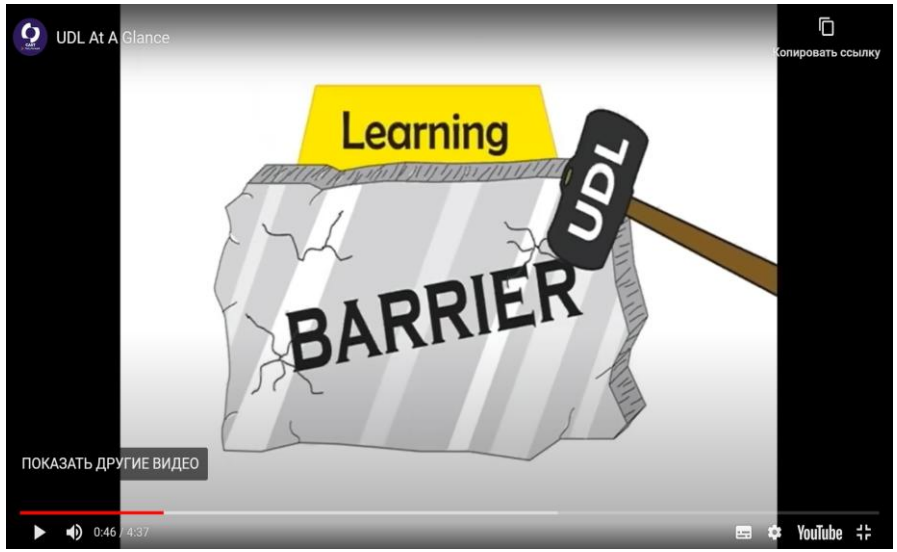
- Provides flexibility and adjustability in the ways of:

(1) Learning content **representation**,

(2) Students' **engagement**,

(3) Knowledge expression and skills demonstration by the students.

- Reduces barriers in instruction, providing appropriate accommodations, supports, and challenges, and maintains high achievement expectations for ALL the students.



Provided by the Higher Education Opportunity Act of 2008 (HEOA). https://mtsac.libguides.com/udl/overview

Why is it important to ensure such flexibility and adaptability?



It is necessary to take into account
(1) the diversity of students
(2) the way each of us learns is as unique as our fingerprints

Therefore, the learning environment must accommodate this diversity.

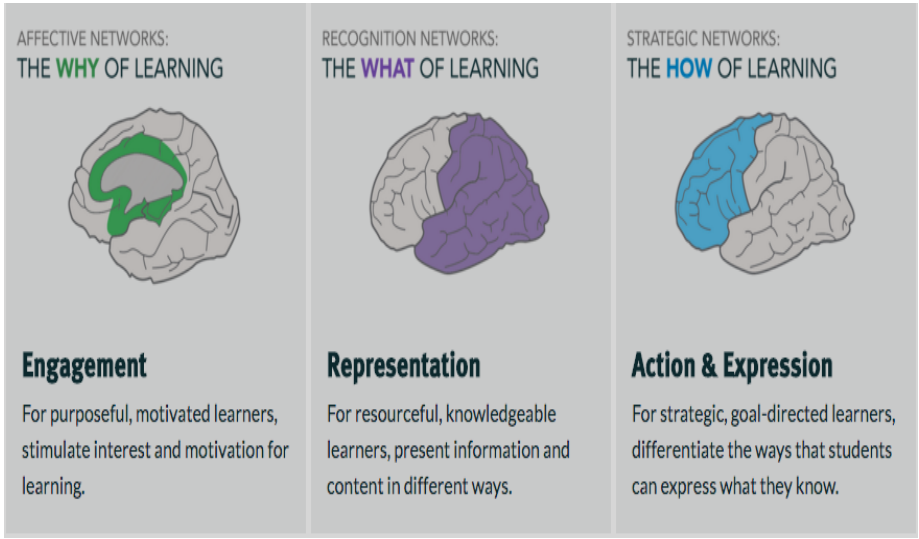




The UDL concept is based on neuropsychology, identifying **three large-scale brain networks**.

The learning process is based on the interaction of several large-scale brain networks, each of which is responsible for certain aspects of information perception, information processing, and decision-making:

1. **Affective networks (why we learn)**:
• Responsible for motivation, interest, and emotional aspects of learning.
2. **Receptive networks (what we learn)**:
• Responsible for the perception and processing of information (vision, hearing, touch).
3. **Strategic networks (how we learn)**:
• Responsible for planning, organizing and completing tasks.



Regarding these networks helps to develop teaching strategies that take into account
the neuropsychological diversity of learners.

The main pillars of UDL, which:

- are based on neuropsychological research,
- determine UDL,
- provide a basic framework for implementing UDL

To learn more about didactic methods for each principle:
https://myusf.usfca.edu/usfteach/udl-toolkit
About digital platform:
https://www.cast.org/resources/digital-tools/udl-curriculum-toolkit-building-flexible-customizable-learning-environments/
Teaching Enhancement Unit https://www.dcu.ie/teu/universal-design-learning-toolkit-july-2021

The Universal Design for Learning Guidelines

The goal of UDL is **learner agency** that is purposeful & reflective, resourceful & authentic, strategic & action-oriented.

	Design Multiple Means of Engagement	Design Multiple Means of Representation	Design Multiple Means of Action & Expression
Access	Design Options for **Welcoming Interests & Identities** • Optimize choice and autonomy • Optimize relevance, value, and authenticity • Nurture joy and play • Address biases, threats, and distractions	Design Options for **Perception** • Support opportunities to customize the display of information • Support multiple ways to perceive information • Represent a diversity of perspectives and identities in authentic ways	Design Options for **Interaction** • Vary and honor the methods for response, navigation, and movement • Optimize access to accessible materials and assistive and accessible technologies and tools
Support	Design Options for **Sustaining Effort & Persistence** • Clarify the meaning and purpose of goals • Optimize challenge and support • Foster collaboration, interdependence, and collective learning • Foster belonging and community • Offer action-oriented feedback	Design Options for **Language & Symbols** • Clarify vocabulary, symbols, and language structures • Support decoding of text, mathematical notation, and symbols • Cultivate understanding and respect across languages and dialects • Address biases in the use of language and symbols • Illustrate through multiple media	Design Options for **Expression & Communication** • Use multiple media for communication • Use multiple tools for construction, composition, and creativity • Build fluencies with graduated support for practice and performance • Address biases related to modes of expression and communication
Executive Function	Design Options for **Emotional Capacity** • Recognize expectations, beliefs, and motivations • Develop awareness of self and others • Promote individual and collective reflection • Cultivate empathy and restorative practices	Design Options for **Building Knowledge** • Connect prior knowledge to new learning • Highlight and explore patterns, critical features, big ideas, and relationships • Cultivate multiple ways of knowing and making meaning • Maximize transfer and generalization	Design Options for **Strategy Development** • Set meaningful goals • Anticipate and plan for challenges • Organize information and resources • Enhance capacity for monitoring progress • Challenge exclusionary practices

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https://mtsac.libguides.com/udl/principles

CAST (2018). *Universal design for learning guidelines version 2.2 [graphic organizer]*. Wakefield, MA: Author.

- :
- **It is important to provide multiple means for**:
- Students' Engagement;
- Learning Content Presentation;
- Students' Action & Knowledge Expression
- **on the each level of the each component of learning**

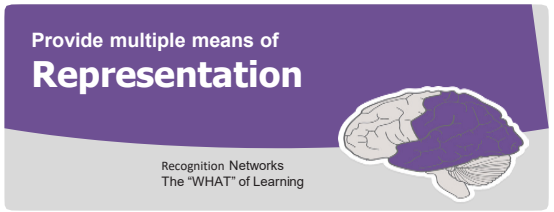
2. Identifying ways to achieve variability
when developing an inclusive course

Therefore, when developing an inclusive course based on UDL, it is necessary to ensure **variability**

- in each of the specified components of learning,
- at all three levels,

which makes it necessary to determine **the ways and tools to achieve such variability**.





Ways to achieve variability of **Learning Content Representation** on different levels

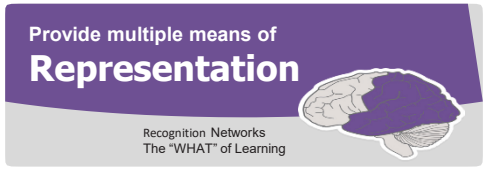
The **Learning Content Representation** in an inclusive course should be adapted to the diverse cognitive and sensory needs of students.

This includes ensuring that information **is accessible**

- through different channels and formats
- at different levels of presentation of learning content.

Ways to achieve variability of **Learning Content Representation** on different levels





How variability can be achieved

Digital tools to achieve variability

Perception of learning content

- providing learning content in various ways (through sight, hearing, touch, etc.);
- providing information in a format that allows the user to customize it.

- Services for converting educational content into video format



invideo AI

elai. powered by Panopto

- Embedded tools of LMSs (Accessibility widgets)

Linguistic-symbolic form of learning content representation

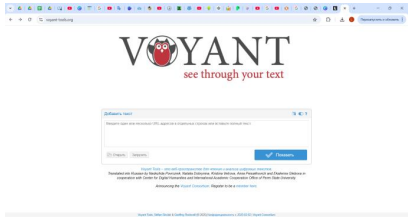
Representation of the learning content in **various forms from the standpoint of its cognitive perception and awareness** (through explanation of textual and symbolic information, different structuring, multiple visualization using various multimedia tools);

Representation of the learning content in different languages

- Graphic Organizers (Lucidchart, Napkin, Canva);

- Tools for semantic analysis of the text (Voyant Tools, TextAnalyzer)





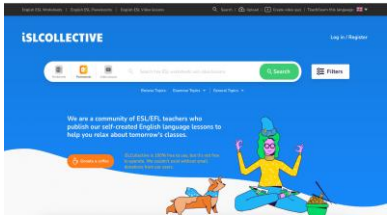
Understanding and awareness of educational content (building system of knowledge)

- Appealing to previously acquired knowledge;
- Generalization of educational information in various ways (through a semantic portrait of educational content, infographics, supporting (video) summaries)
- Managing the process of assimilation (processing) of educational content using interactive visualization

Tools for design of interactive video and presentations (H5P, ISLCollective, EddPuzzle, Mentimeter etc.)

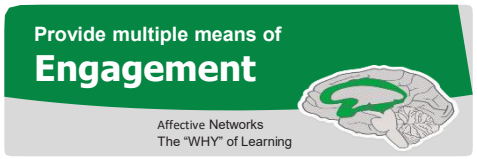
My Storybook

H5P



Ways to achieve variability of students' **Engagement and Motivation** in inclusive courses on different levels





How variability can be achieved

Digital tools to achieve variability

Welcoming and maintaining interest in learning

- Varied ways to draw attention to relevant information;
- Supporting individual choice and autonomy;
- Custom settings to minimize distractions and "false security"

Imbedded in the learning platforms means of
- attention attraction and its retaining,
- emotional connection through personalized greetings,
- discussions in forums and encouragement from the teacher side.

Sustaining effort and persistence

- Increasing the relevance of goals and objectives
- Variation (ranking) of course and microtask requirements
- Stimulating collaboration through various means of interactivity
- Increasing feedback aimed at improving learning outcomes

Kahoot!: used to create quizzes and games that increase interest in learning.

Mentimeter: 

to create interactive surveys and collect student opinions in real time.

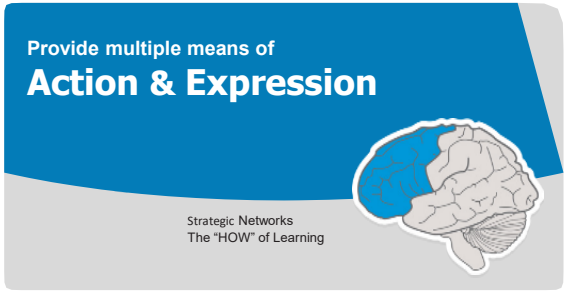
ClassCraft: 

Self-regulation as the ability to manage one's own emotional states for effective interaction with the learning environment

- Promoting expectations and beliefs that enhance motivation;
- Developing personal skills and coping strategies;
- Developing self-esteem and reflection.

Trello: helps organize group projects and provides transparency in the distribution of tasks.

Padlet: an interactive whiteboard for collaboration and exchange of ideas between students.



Ways to achieve variability in the means of **Students' Action & Knowledge Expression** on different levels

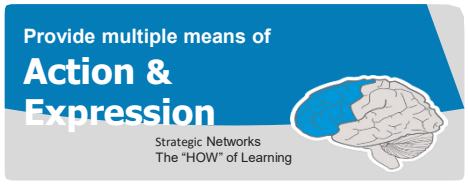
It is important to provide students with the **opportunity to choose**

- how to complete tasks
- how to demonstrate their knowledge.

This promotes creativity and reduces barriers to learning.

Ways to achieve variability in the means of **Students' Action & Knowledge Expression** on different levels





	How variability can be achieved	Digital tools to achieve variability
Physical actions to access and navigate learning content	• Varied navigation and feedback methods; • Supporting individual access to learning tools and assistive technologies;	- Embedded tools for navigation in LMSs (Accessibility widgets).
Expression (demonstration) of knowledge and communication	• Variety of communication tools • Provide opportunities for students to demonstrate knowledge through a variety of tools and formats. • Provide assessment flexibility through graded levels of support for practical tasks and performance	Tools for creating infographics as an alternative way for students to express their knowledge and opinions (**Lucidchart, Napkin, Canva**); Tools for story telling design (**MyStorybook Moovly, Adobe Spark**) Tools for design of interactive video and presentations **(H5P, ISLCollective, EddPuzzle)**
Implementation of executive functions (*)	• Managing the right goal setting • Supporting planning and developing learning strategies • Enhancing the ability to monitor learning progress • Using formative assessment (self-reflection or peer assessment), so students can reflect on their achievements	Teamwork tools (**Miro or Trello**) to collaborate on projects

(*) **Executive functions** are the abilities that allow people to overcome impulsive, short-term responses to the environment and instead set long-term goals, plan effective strategies to achieve those goals, monitor their progress, and change strategies as needed..

4. Issues of inclusive online courses expertise and certification

(1) Overview of major existing approaches and regulatory frameworks for quality certification of online courses

Framework/Approach	Scope	Focus
Quality Matters (QM)	Course design & review	Peer-review rubric, research-based
OLC Quality Scorecards	Course/Program	Institutional benchmarking
NSQOL Standards	K-12 & HE	Accessibility, design, evaluation
QSOC	Institutional	Comprehensive online course quality
OSCQR	Institutional course review	Aligns objectives, assessments, accessibility
MOOC QRF	MOOC quality	International reference model

(2) Quality Matters (QM) rubric for online instruction: key six metric

Quality Matters (QM) rubric for online instruction was elaborated and used by California State University [1, 2].

The rubric determines six key metrics which characterize the requirements to high quality online course and include the estimation of the following parameters:

(1) Learner Support and Resources;
(2) Online Organization and Design;
(3) Instructional Design and Delivery;
(4) Assessment of Student Learning;
(5) Innovative Use of Technology;
(6) Use of Student's Feedback.

1. Quality Matters (QM) URL https://www.qualitymatters.org/qa-resources/rubric-standards/higher-ed-rubric?utm_source

2. Rubric for Online Instruction (ROI) URL https://www.csuchico.edu/eoi/_assets/documents/rubric.pdf

Results & Discussion

Matching of QM rubric metrics for online courses sertification with UDL principles

To align metrics of the QM rubric for online courses sertification (pointed out above) with the three UDL principles as a basis for inclusive courses design, there was made the following matching.

Based on the held matching, the requirements for a high-quality inclusive online course were actually formulated in accordance with each metric and all UDL principles.

QM rubric metric	**UDL principles as provision of variability for:**
1. Learner Support and Resources	(1) Presentation of Learning Content; (2) Learners' Engagement
2. Online Organization and Design	(1) Presentation of Learning Content
3.Instructional Design and Delivery	(1) Presentation of Learning Content; (2) Learners' Engagement; (3) Lerners' Action and Knowledge Expression
4. Assessment of Student Learning	(2) Learners' Engagement; (3) Lerners' Action and Knowledge Expression
5. Innovative Use of Technology	(1) Presentation of Learning Content; (2) Learners' Engagement; (3) Lerners' Action and Knowledge Expression
6. Use of Student's Feedback	(2) Learners' Engagement

Criteria support to assess the quality of implementation of UDL principles in the design of inclusive online courses

At the next stage, appropriate criteria support allowing to assess the quality of implementation of UDL principles in the design of inclusive online courses was developed:

- We identified a number of criterion marks that indicate the quality of implementation of each UDL principle at different levels pointed out above.
- The identified criterion marks were grouped in accordance with each UDL principle and each level of its implementation

Criteria marks to assess the quality of implementation of UDL principle 1 (provision of variability of Presentation of Learning Content) in the design of inclusive online courses

The following criteria marks were identified that must be estimated in the progress of the pedagogical expertise.

At the level of physical access to the learning content it is realized via:

• mark 1.1.1: presenting learning content in various ways (visual, audio, touch, etc.);

• mark 1.1.2: presenting information in a format that expects the user's customizing.

At the level of cognitive accessibility of the learning information it is reached via:

• mark 1.2.1: providing educational information in various forms from the standpoint of its cognitive perception and awareness (through explanation of textual and symbolic information, different structuring, variable illustration using various multimedia tools);

• mark 1.2.2: providing information in different languages.

At the level of a student's executive function, understanding and awareness of educational content is implemented through:

• mark 1.3.1: appealing to previously acquired knowledge;

• mark 1.3.2: generalization of educational information in various ways (through a semantic portrait of educational content, infographics, supporting (video) summaries etc.);

• mark 1.3.3: management of the process of assimilation (processing) educational content using interactive visualization.

Criteria marks to assess the quality of implementation of UDL principle 2 (provision of variability of Learners' Engagement and Motivation) in the design of inclusive online courses

At the level of physical access to the learning content attracting and maintaining interest in learning is realized through:

- mark 2.1.1: varying ways of drawing attention to relevant information;
- mark 2.1.2: supporting individual choice and autonomy;
- mark 2.1.3: personal customizing to minimize distractions and feel "mistakes security".

At the level of cognitive accessibility of the learning maintaining student's learning efforts and perseverance is achieved through:

- mark 2.2.1: varying (ranking) the requirements for completing course tasks and microtasks;
- mark 2.2.2: stimulating cooperation through various means of interactivity (encouraging students to discuss content and complete tasks on the forum and/or creating a special pool ("sandbox") for collective solving of learning tasks, etc.);
- mark 2.2.3: varying the means of feedback aimed at improving learning outcomes.

At the level of a student's executive function, developing self-regulation as the ability to manage one's own emotional states for effective interaction with the learning environment is provided through:

- mark 2.3.1: promoting expectations and beliefs that increase motivation;
- mark 2.3.2: developing personal skills and coping strategies;
- mark 2.3.3: developing self-esteem and reflection.

Criteria marks to assess the quality of implementation of **UDL principle 3** (provision of variability of Lerners' Action & Ways of Knowledge Expression) in the design of inclusive online courses

At the level of physical accessibility to the learning content, physical actions for accessing and navigating around educational content is provided through:

- mark 3.1.1: varying methods of navigation and feedback;
- mark 3.1.2: supporting individual access to educational tools and assessment technologies.

At the level of cognitive accessibility, expression (demonstration) of student's knowledge and communication is realized with:

- mark 3.2.1: providing students with the opportunity to demonstrate knowledge using a variety of tools and different forms of presenting the results of completing tasks, also different in type (tests, exercises, individual tasks, essays, creative projects, case analysis, etc.);
- mark 3.2.2: ensuring flexibility of assessment through graduated levels for practical tasks and the productivity of their implementation.

At the level of a student's executive function, its implementation is realized through:

- mark 3.3.1: managing the correct setting of student learning goals;
- mark 3.3.2: supporting planning and development of learning strategies;
- mark 3.3.3: expanding the possibilities of monitoring learning progress.

The procedure of the pedagogical expertise for inclusive online courses as the components of university digital ecosystem: Rubric for practical evaluation of inclusive online courses designed on the UDL basis

UDL Principles	Criteria marks at three levels and the results of their evaluation in 5-point scale					
	Level of physical access to the learning content	Points (1-5)	Level of cognitive accessibility of the learning content	Points (1-5)	Level of a student's executive function	Points (1-5)
Principle 1 provision of variability of Presentation of Learning Content						
	mark 1.1.1		mark 1.2.1		mark 1.3.1	
	mark 1.1.2		mark 1.2.2		mark 1.3.2	
					mark 1.3.3	
In total as for Principle 1						
Principle 2 provision of variability of Learners' Engagement and Motivation						
	mark 2.1.1		mark 2.2.1		mark 2.3.1	
	mark 2.1.2		mark 2.2.2		mark 2.3.2	
	mark 2.1.3		mark 2.2.3		mark 2.3.3	
In total as for Principle 2						
Principle 3 provision of variability of Lerners' Action and Ways of Knowledge Expression						
	mark 3.1.1		mark 3.2.1		mark 3.3.1	
	mark 3.1.2		mark 3.2.2		mark 3.3.2	
					mark 3.3.3	
In total as for Principle 3						
In total as for the levels		for Lev. 1		for Lev. 2		for Lev. 3
In total as for all principles and the levels of their implementation						∑

Rubric for practical evaluation of inclusive online courses designed on the UDL basis: five-point scale

five-point scale, which reproduces five levels of manifestation of the criterion features we have identified:

- 1 (very low) - indicates the complete/almost complete absence of the criteria mark or its uncertainty;
- 2 (low) - corresponds to the insignificant presence or weak formation of the criteria mark;
- 3 (medium) - characterizes the presence of the criteria mark, but not fully or not thoroughly;
- 4 (high enough) - determines a sufficiently high level of detection of the mark, however, the designed inclusive online course cannot be considered perfect regarding UDL pillars;
- 5 (high) - indicates a complete, optimally possible detection of the criterion mark.

Practical case of the expertise of exact course: the example workflow step-by-step course evaluation

- Select the course for evaluation.

  Example: A second-year “Foundations of Educational Research” online course offered via the university LMS.

- Assign expert reviewers.

  Two reviewers with instructional design/UDL training independently assess the course using the developed rubric.

  Each reviewer uses the criterion marks (e.g., 1.1.1, 1.2.1, 2.2.3) and assigns scores on the 5-point scale.

- Procedure itself.

  - Gather evidence: review syllabi, content modules, multimedia files, assessment tasks, navigation menus, and discussion forums.
  - Map evidence to criterion marks:

    Example: Module 3 has videos with subtitles (transcripts) → satisfies 1.1.1 and partially 1.1.2 since customizable text format is present.

    Assess if multiple languages are available (1.2.2) or if translation tools/alternatives are offered.

Practical case of the expertise of exact course: the example workflow step-by-step course evaluation

- Review learning activities.
  Analyze whether students are offered flexible ways to demonstrate mastery: e.g., quiz + essay + multimedia project → relates to UDL Principle 3: expressing knowledge and criterion marks 3.2.1 and 3.2.3.
- Evaluate engagement and motivation supports
  Check if interactive discussion prompts and peer-review spaces exist → crosswalk to Principle 2: engagement and marks 2.2.2 or 2.3.3.
- Compile scores and recommendations

After scoring, reviewers convene to triangulate results (see Table above) and produce an expertise report with evidence-based recommendations.

For instance, the expertise report for selected criterion mark may look like this one.

Practical case of the expertise of exact course: the example workflow step-by-step course evaluation

The sample of expertise report for selected criterion mark for UDL Principle 2 (provision of variability of Learners' Engagement and Motivation):

Criterion mark 2.2.2 – stimulating cooperation through various means of interactivity.
Observation: The course uses asynchronous forums but no structured collaborative tasks.

Analysis: While discussion exists, lack of specific collaborative tasks (e.g., peer review, sandbox space) limits variability in engagement.
Recommendation: Add scaffolded group projects with clear roles, increasing engagement and motivational scaffolding (in line with research on how UDL fosters inclusive participation)

Benefits of the developed criteria support and tools for university inclusive digital ecosystem

Their implementation provides the following:

(1) Evidence-based quality assurance: the developed rubric operationalizes UDL principles into measurable, observable indicators that can be used institution-wide.
(2) Systematic courses improvement: the rubric results identify specific areas for improvement, encouraging iterative enhancements over time.
(3) Enhanced learner experience: courses evaluated and improved using UDL-aligned criteria are more likely to support accessibility, engagement, and motivation for diverse learners

Piloting procedure of the rubric

In order to validate the developed rubric for pedagogical expertise of inclusive online courses designed on the basis of UDL pillars,
a piloting of the rubric was conducted within the Erasmus+ project Academic Freedom and Inclusion through Digitalization (AFID).

Author’s course “Tools for inclusive course design” as a component of inclusive virtual campus (AFID project).



The rubric was applied during the development and implementation of the author’s course “Tools for Inclusive Online Course Design” as a component of the inclusive virtual campus developed within the project

Theoretical framework of the course

Засади доступності (accessability) сучасної вищої освіти

Accessibility issues in modern higher education



Принципи універсального дизайну в навчанні (Universal Design for Learning (UDL)).

Principles of Universal Design for Learning



Нейро-психологічні засади реалізації принципів UDL для кожного з компонентів навчання

Neuro-psychological foundations of implementing UDL principles for each component of learning



Practical focus of the course: digital tools mastering



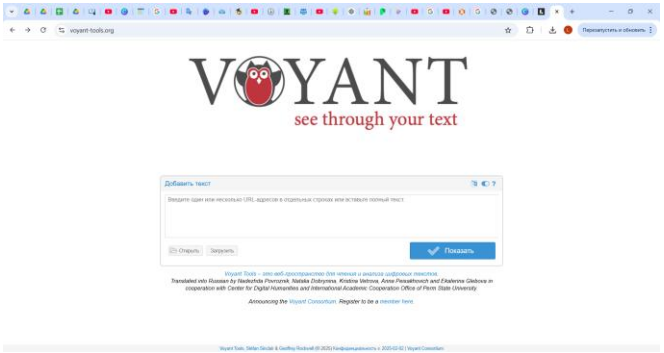


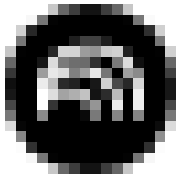






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Practical cases of digital tools implementation:

The students were offered to perform the variety of the tasks:

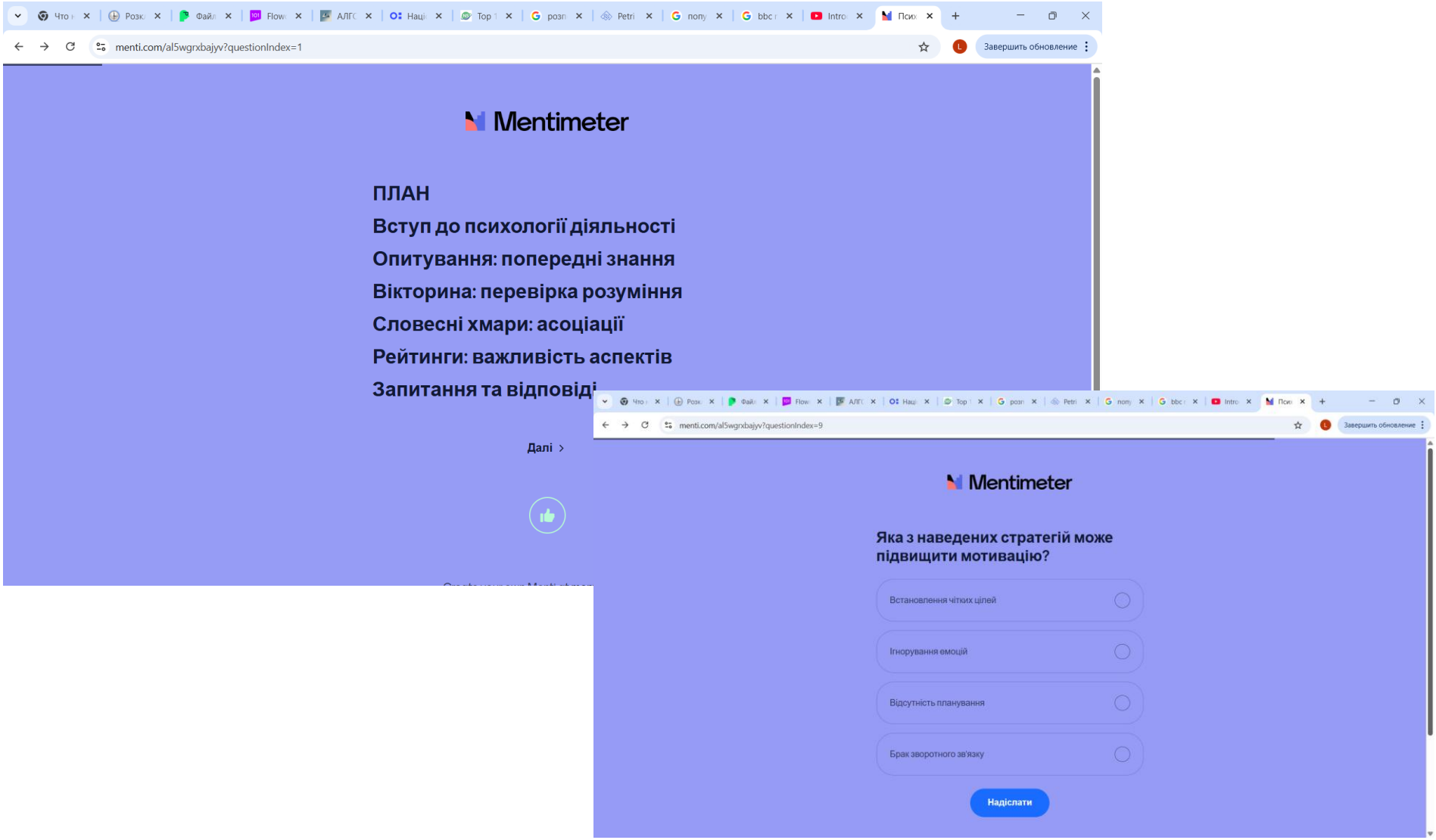
- analytical task of establishing connections between the components of the learning process and the components of the inclusive online course;
- practically-driven tasks for mastering selected digital tools to ensure the variability of:

Students' Engagement and Motivation
Learning Content Representation
Students' Action & Knowledge Expression

Practical cases of digital tools implementation:

Episodes of students' tasks doing within the course piloting

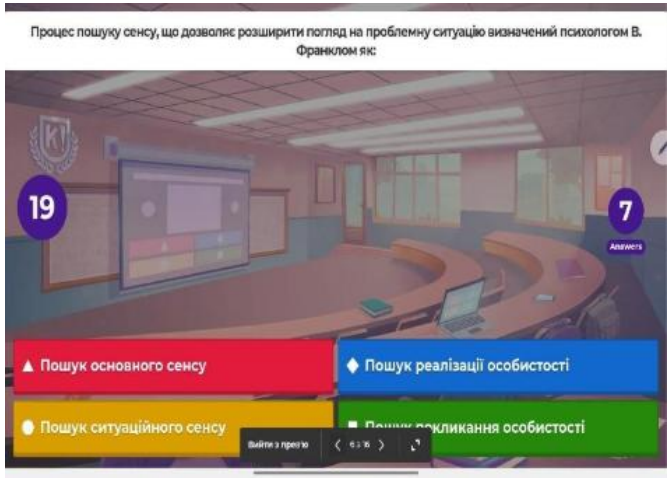
Digital tools using to achieve variability in students' motivation

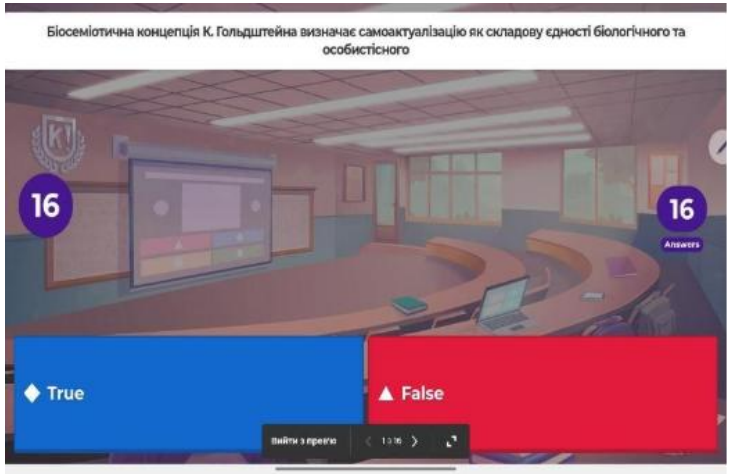


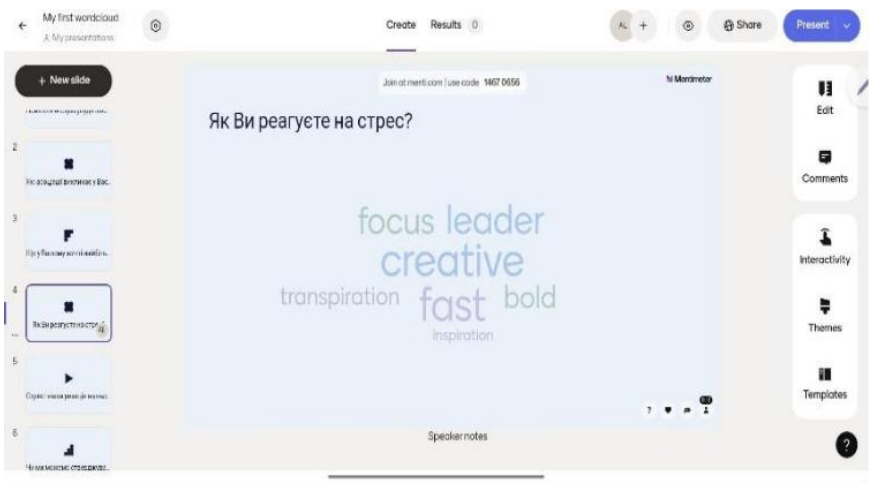
Practical cases of digital tools implementation:

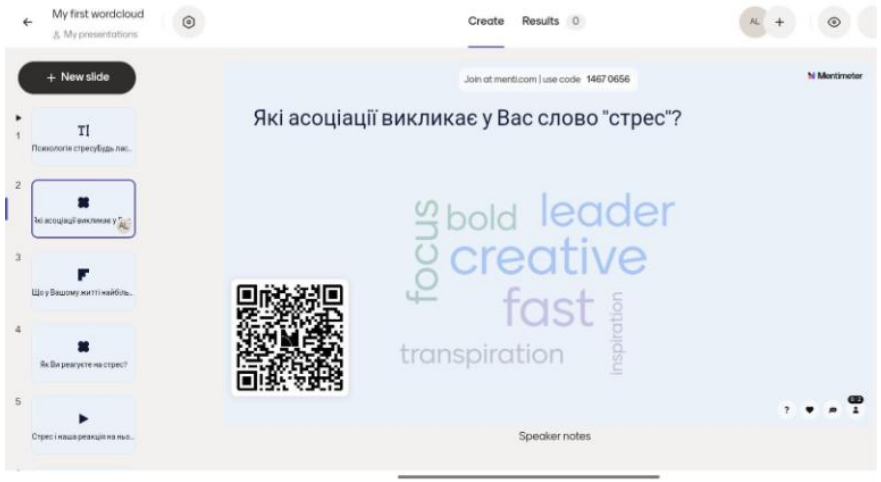
Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability in students' motivation







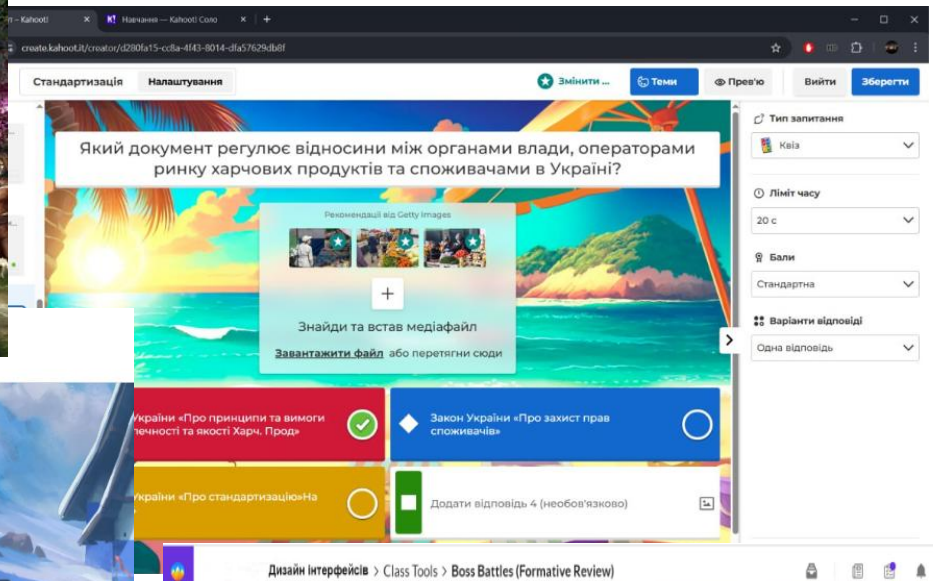


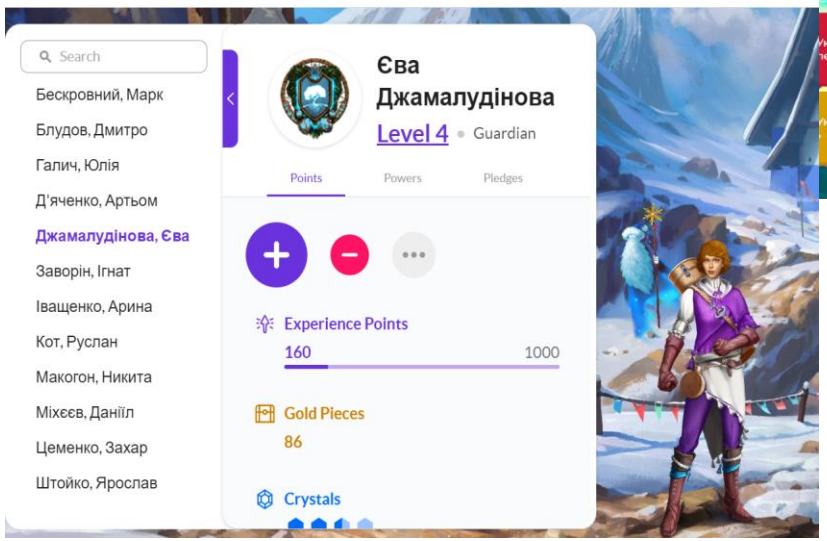
Practical cases of digital tools implementation:

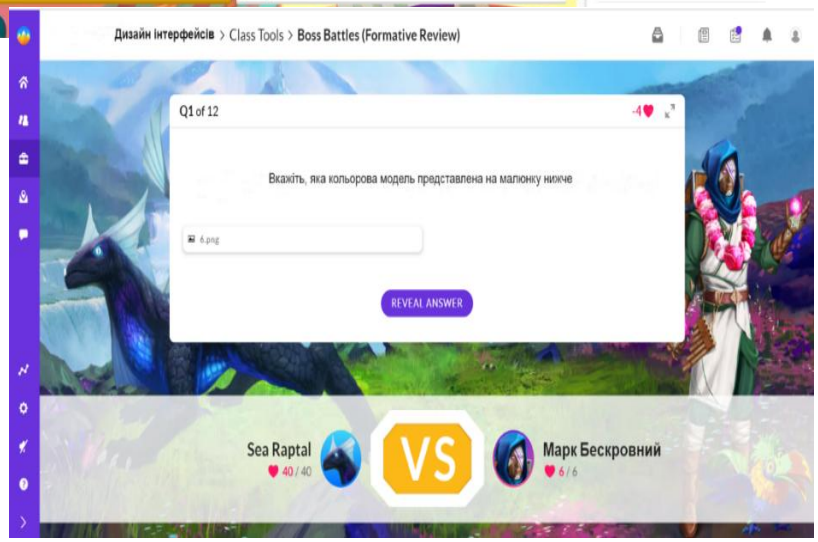
Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability in students' motivation









Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability
of Learning Content Representation



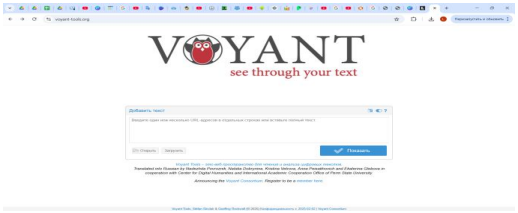
invideo AI

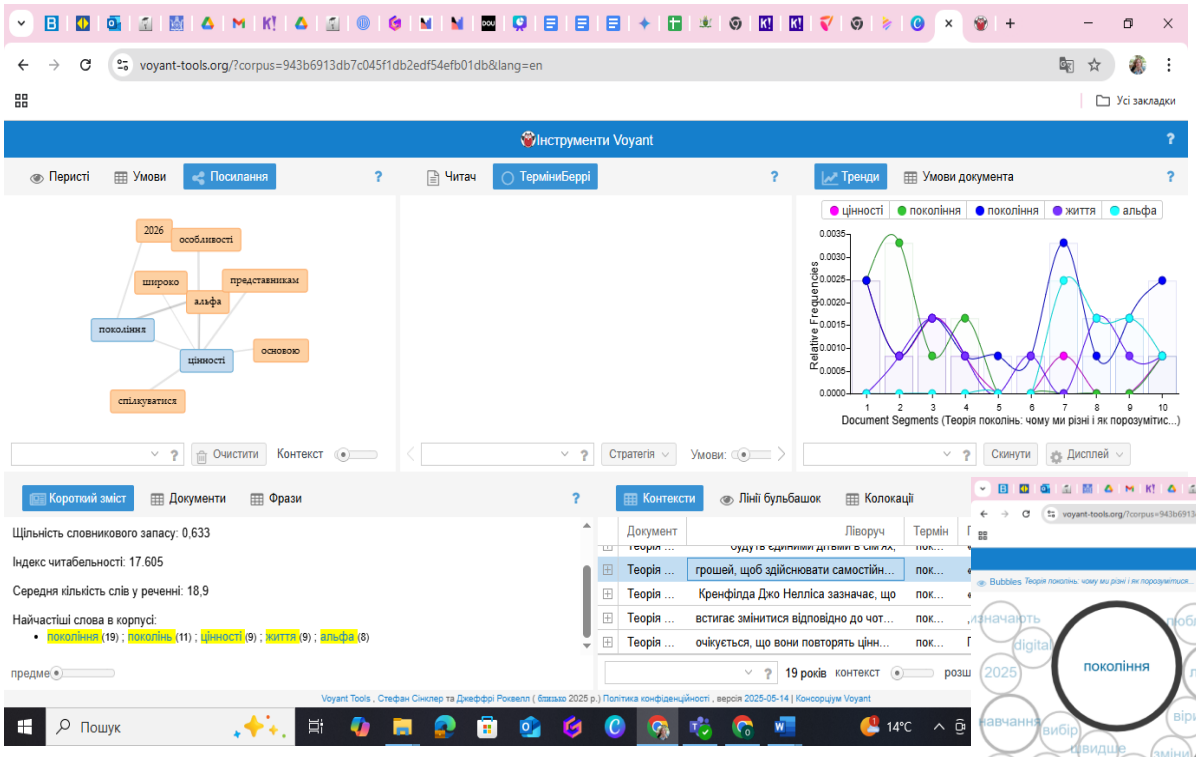
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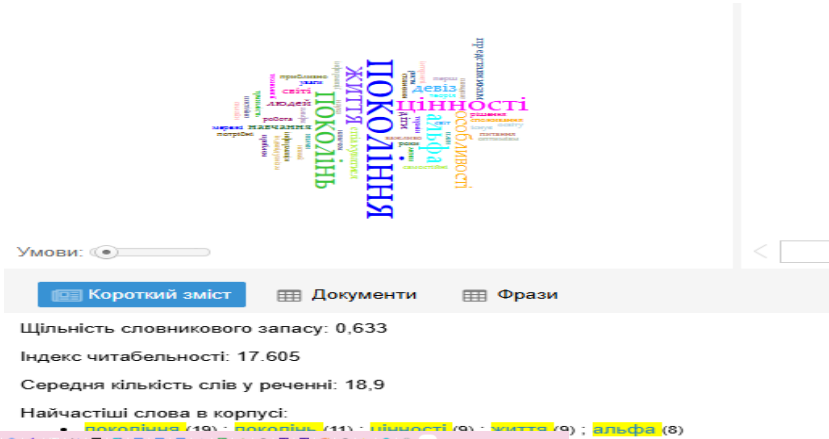


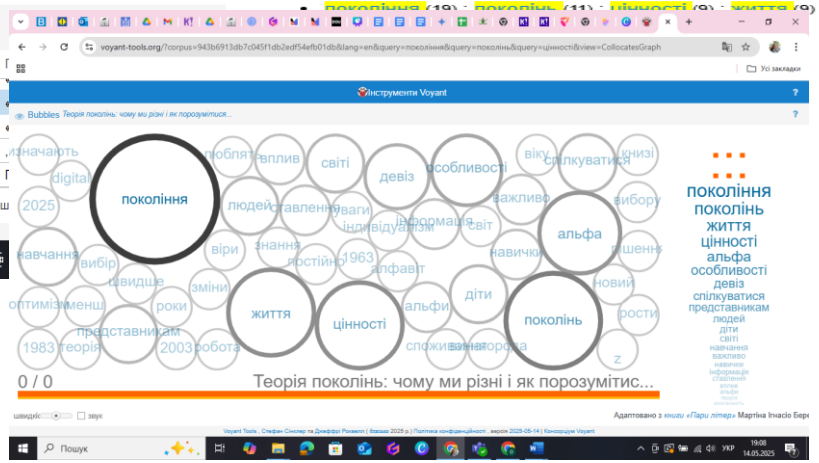
Episodes of students' tasks doing within the course piloting

Digital tools mastering to achieve variability of Learning Content Representation









https://voyant-tools.org/?lang=en

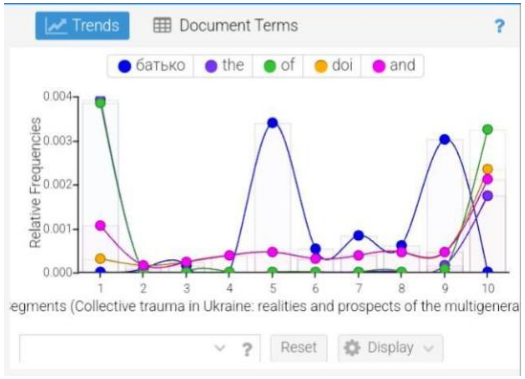
Episodes of students’ tasks doing within the course piloting

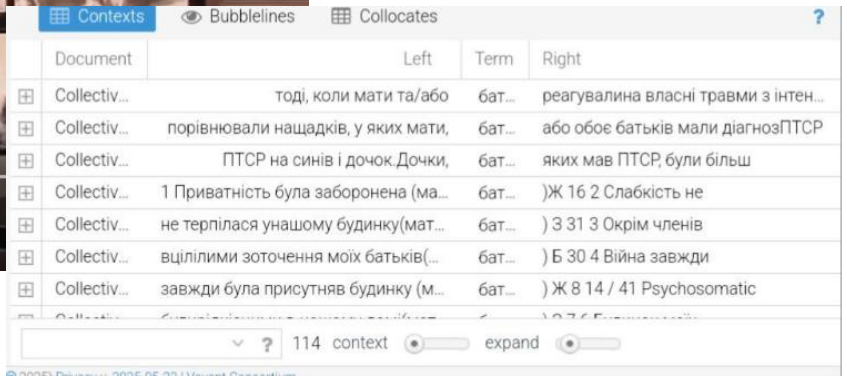
Digital tools using to achieve variability
of Learning Content Representation



invideo AI







https://h5p.org/tutorial-interactive-video?utm_source=chatgpt.com

Episodes of students’ tasks doing within the course piloting

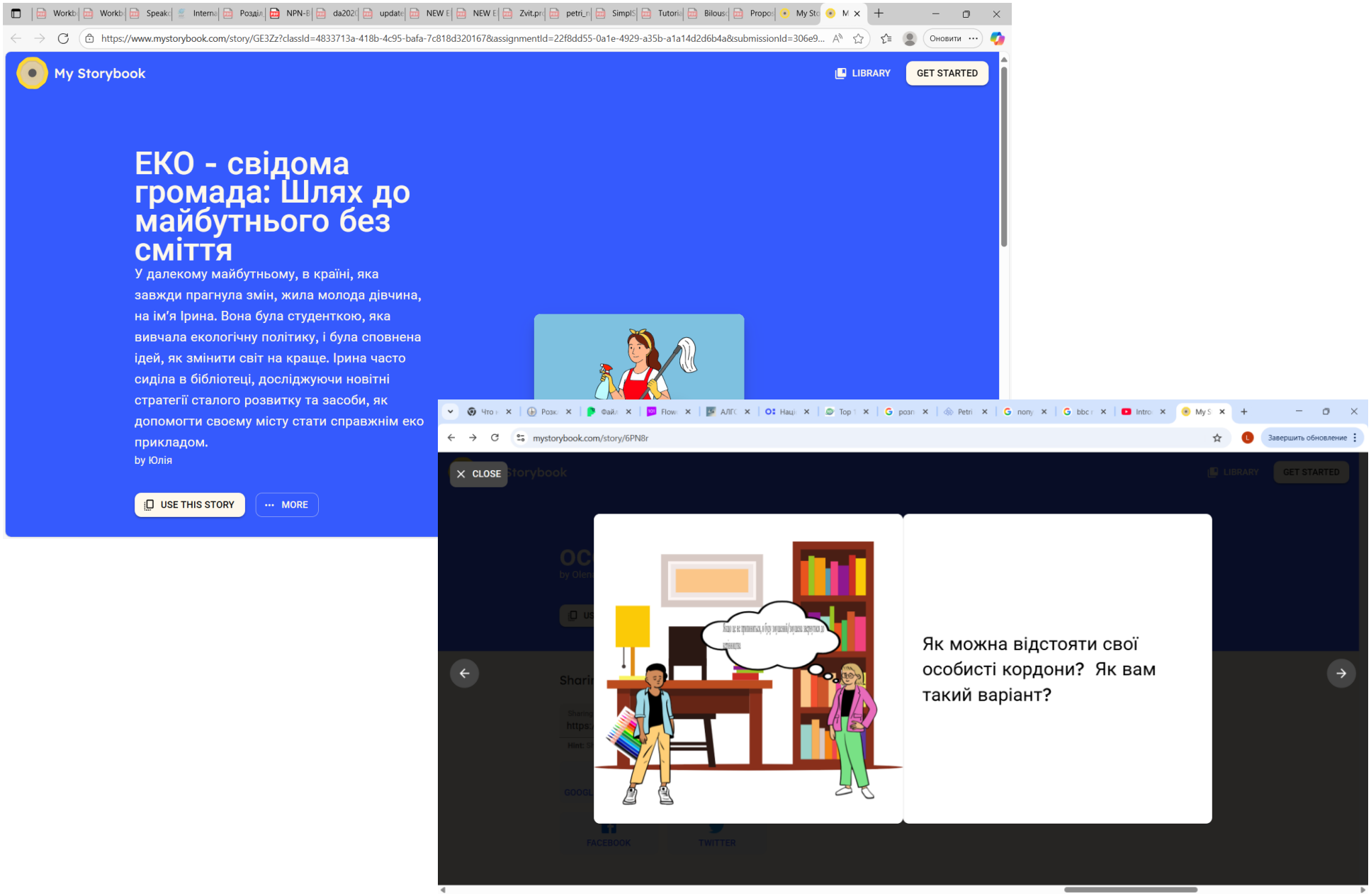
Digital tools using to achieve variability in Learning Content Representation





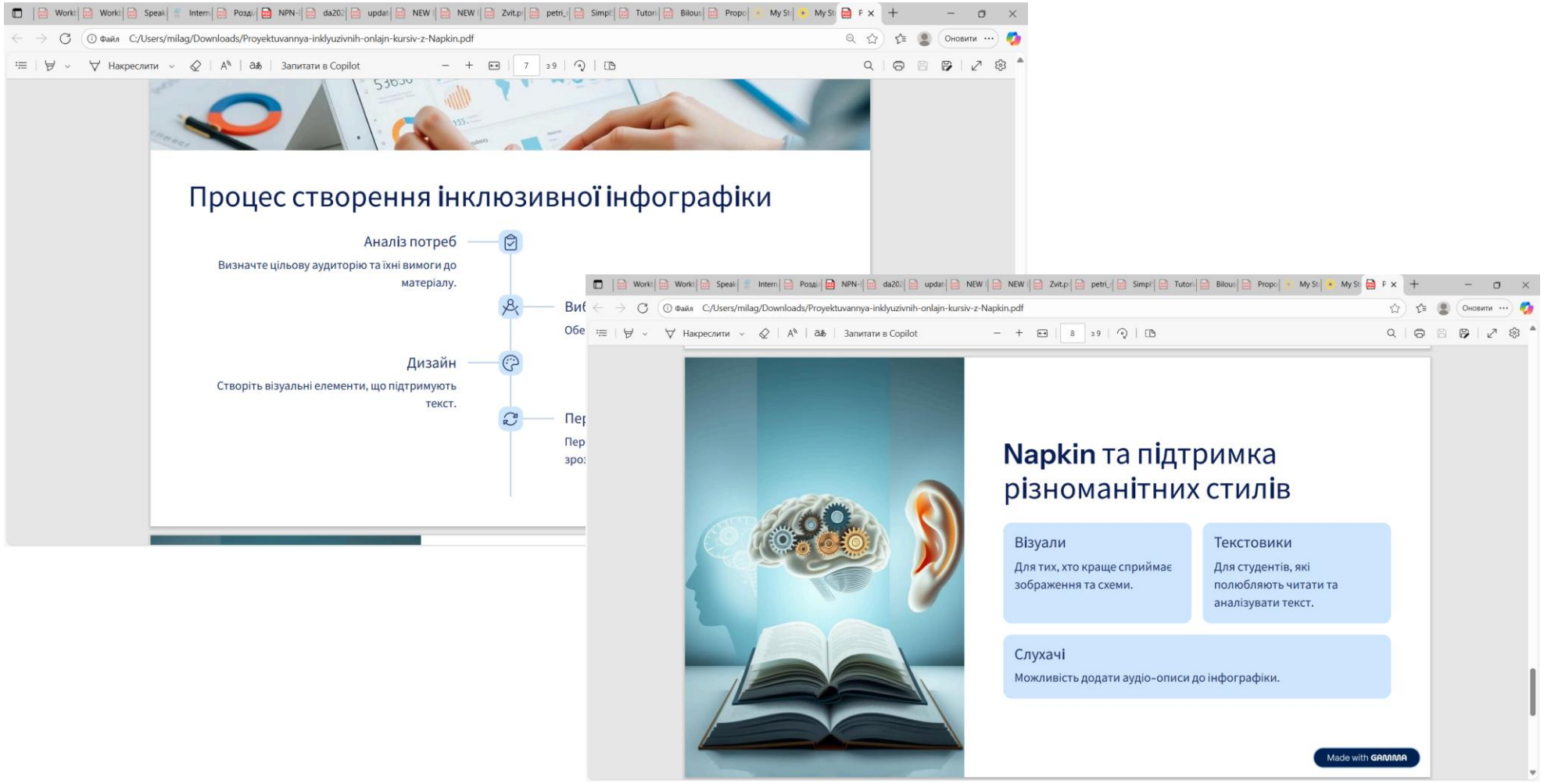
Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability in Knowledge Expression



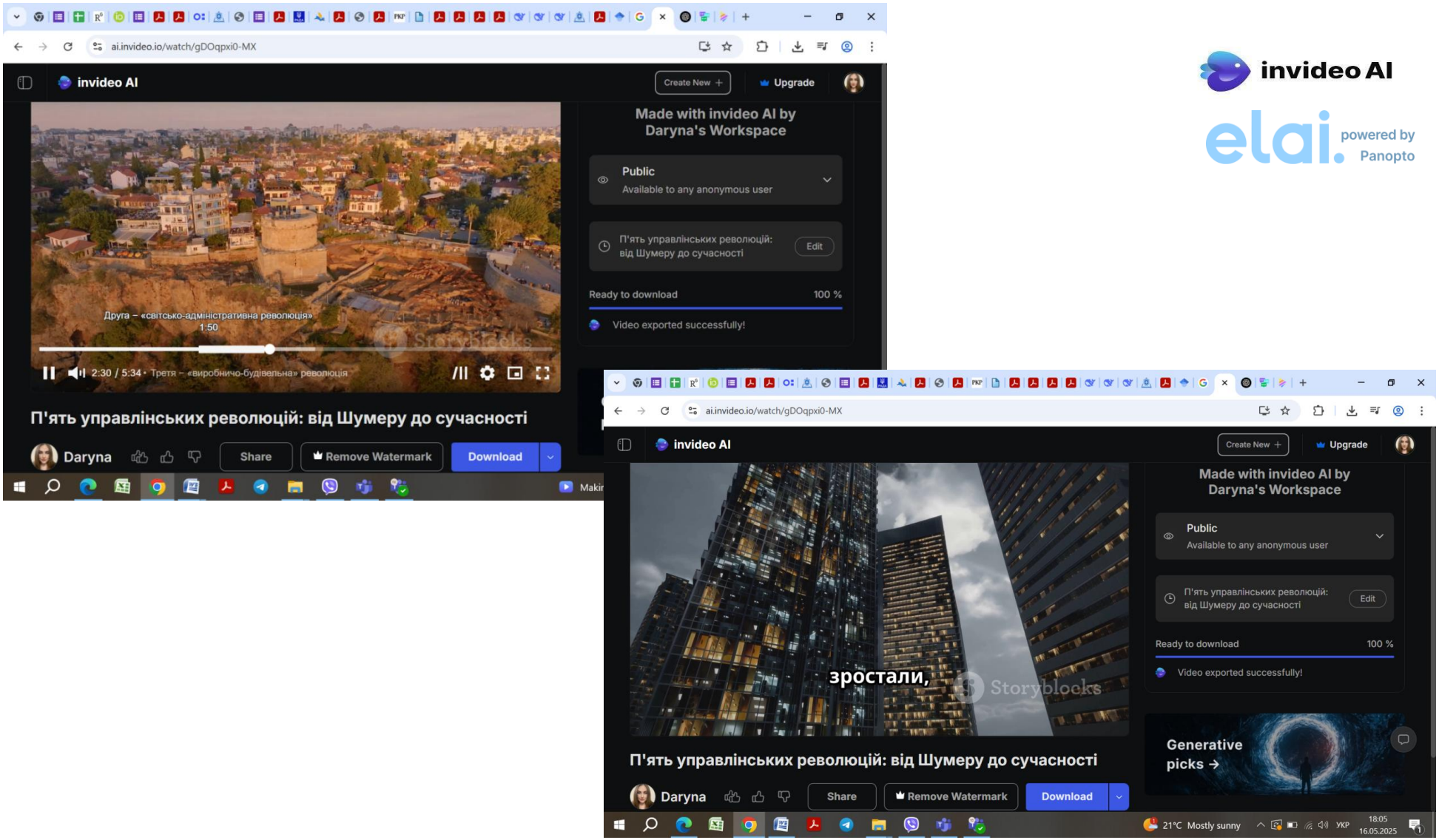
Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability in Knowledge Expression



Episodes of students' tasks doing within the course piloting

Digital tools using to achieve variability in Knowledge Expression



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Preparation Stage of Piloting Procedure

The purpose of the piloting was clarified:
to verify the practical applicability of the rubric;
to estimate the clarity and interpretability of the identified criterion marks;
to determine the consistency of experts' evaluations;
to refine the wording and structure of several criteria marks;
to assess the feasibility of using the rubric as a practical instrument for pedagogical expertise and certification of inclusive online courses.

Three independent experts participated in the pilot evaluation:
Expert A – specialist in online pedagogy and instructional design;
Expert B – specialist in inclusive education and accessibility;
Expert C – specialist in digital learning environments and educational technologies.

Active Stage of Piloting

The experts independently evaluated the online course using the developed rubric for the course evaluation.

Criterion mark	Expert A	Expert B	Expert C	Mean score
1.1.1 Presenting content in multiple formats	5	4	5	4.67
1.1.2 User customization of content format	4	4	5	4.33
1.2.1 Variability of cognitive representation	5	4	4	4.33
1.2.2 Providing information in different languages	3	3	2	2.67
1.3.2 Semantic generalization of content	4	5	4	4.33
2.1.2 Support for learner autonomy	5	4	5	4.67
2.2.2 Interactive collaboration opportunities	4	4	3	3.67
2.2.3 Variability of feedback tools	4	5	4	4.33
2.3.3 Development of reflection and self-assessment	5	4	4	4.33
3.1.1 Variability of knowledge expression tools	5	5	4	4.67
3.2.2 Flexibility of assessment methods	4	4	5	4.33
3.3.1 Support for planning and learning strategies	4	3	4	3.67

Analysis of the consistency of expert evaluations

To estimate the consistency of expert evaluations,
inter-rater reliability analysis was conducted.
Since the rubric used ordinal scores assigned by three independent experts, the **Intraclass Correlation Coefficient** (ICC) was selected.

The analysis demonstrated ICC = 0.87 for the overall rubric which corresponds to a high level of inter-rater agreement (according to commonly accepted interpretations of ICC, values 0.75–0.90 match good agreement).
Thus, the obtained coefficient (ICC = 0.87) indicates that the developed **rubric ensures sufficiently stable and consistent evaluation results** when applied by different experts.

Piloting results

The piloting results confirmed that the developed rubric may serve as an effective pedagogical expertise instrument for assessing inclusive online courses within the university digital ecosystem.

Unlike many existing online course quality frameworks, the proposed rubric operationalizes all three UDL principles through concrete measurable criterion marks distributed across different implementation levels.

This creates opportunities not only for summative certification of online courses but also for formative improvement of digital learning environments.

Piloting results

The piloting revealed the importance of several aspects requiring refinement of the evaluation procedure, which is reflected in the made recommendations.

1. **Clarification of criterion descriptors**. Some criterion marks related to self-regulation, emotional support, cognitive accessibility, and learner autonomy were interpreted differently by experts. Therefore, additional descriptors and examples of evidence were added to improve interpretability.
2. **Necessity to define more explicitly what evidence should be analyzed** during expertise (course syllabus; multimedia learning materials; accessibility settings; communication tools; assessment activities; discussion forums; interactive tasks; learning analytics and/or others). Thus, specification of evidence sources is strongly recommended.
3. **The piloting also confirmed the importance of preliminary calibration sessions for experts prior to evaluation**. Such sessions help unify understanding of rubric descriptors, minimize subjective interpretation, and finally, increase scoring consistency.

Piloting results

The piloting revealed the importance of several aspects requiring refinement of the evaluation procedure, which is reflected in the made recommendations.

The rubric can be applied:

(1)during expertise and certification of online courses;
(2)during course design and redesign;
(3)as a checklist for instructional designers and teachers.

Its implementation allows integrating UDL principles at the early stages of online course development.

Thanks for attention!

Author's key work on the topic

Bilousova, L., & **Gryzun, L**. (2025) DIGITAL TOOLS SELECTION FOR INCLUSIVE COURSE DESIGN AT UNIVERSITY. *The Modern Higher Education Review*, (10), 318–347. https://doi.org/10.28925/2617-5266/2025.1014

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