

# The SL-ReDu Environment for Self-monitoring and Objective Learner Assessment in Greek Sign Language

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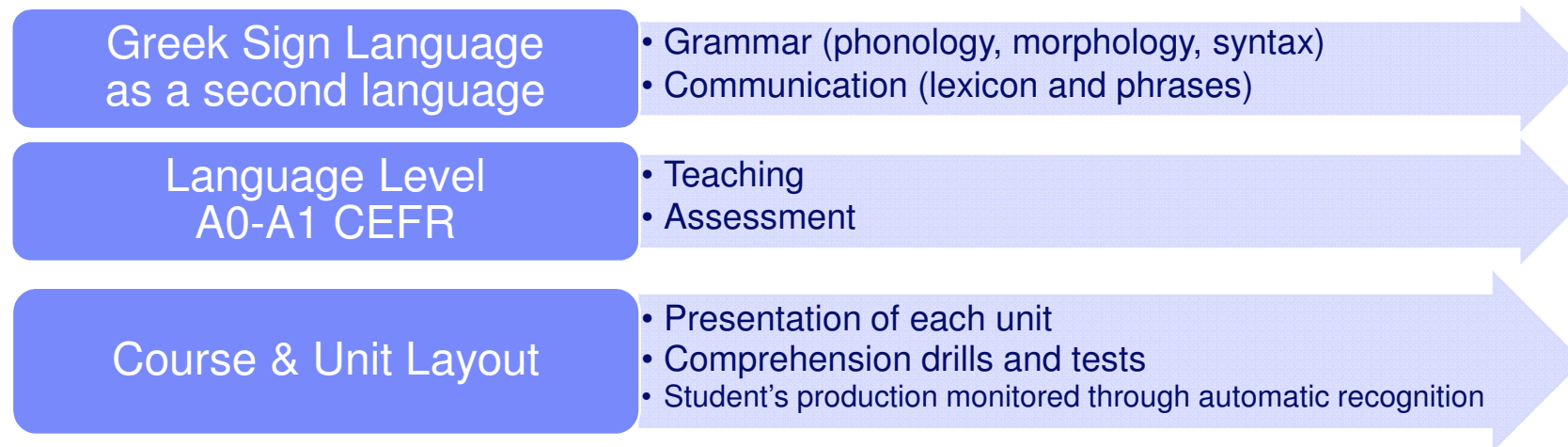


## *Presentation structure*

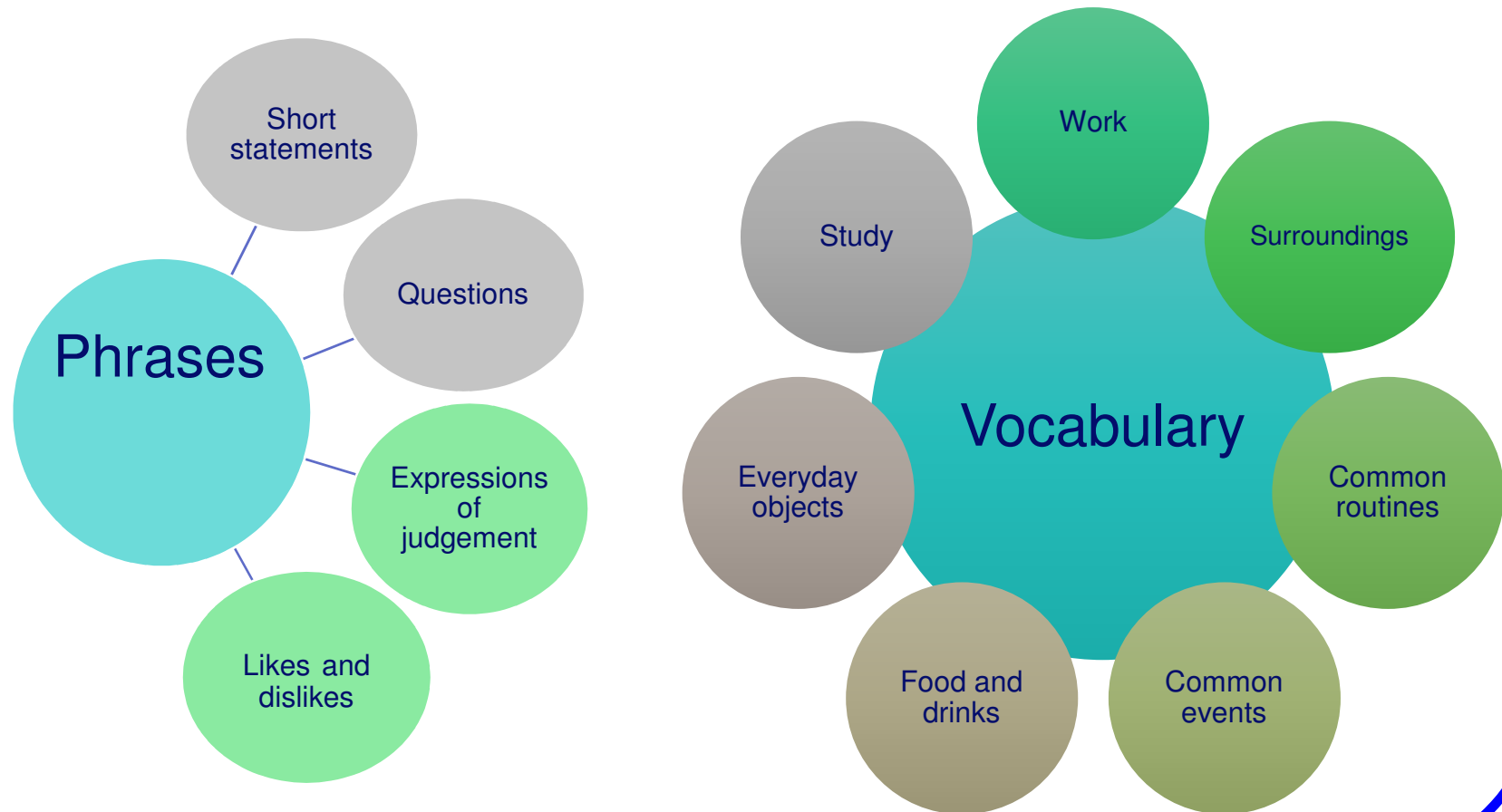
- \* SL-ReDu project overview
- \* Educational content
- \* Platform features and functionalities
- \* HCI in service of perception and
- \* Active student performance
- \* Conclusion and future plans



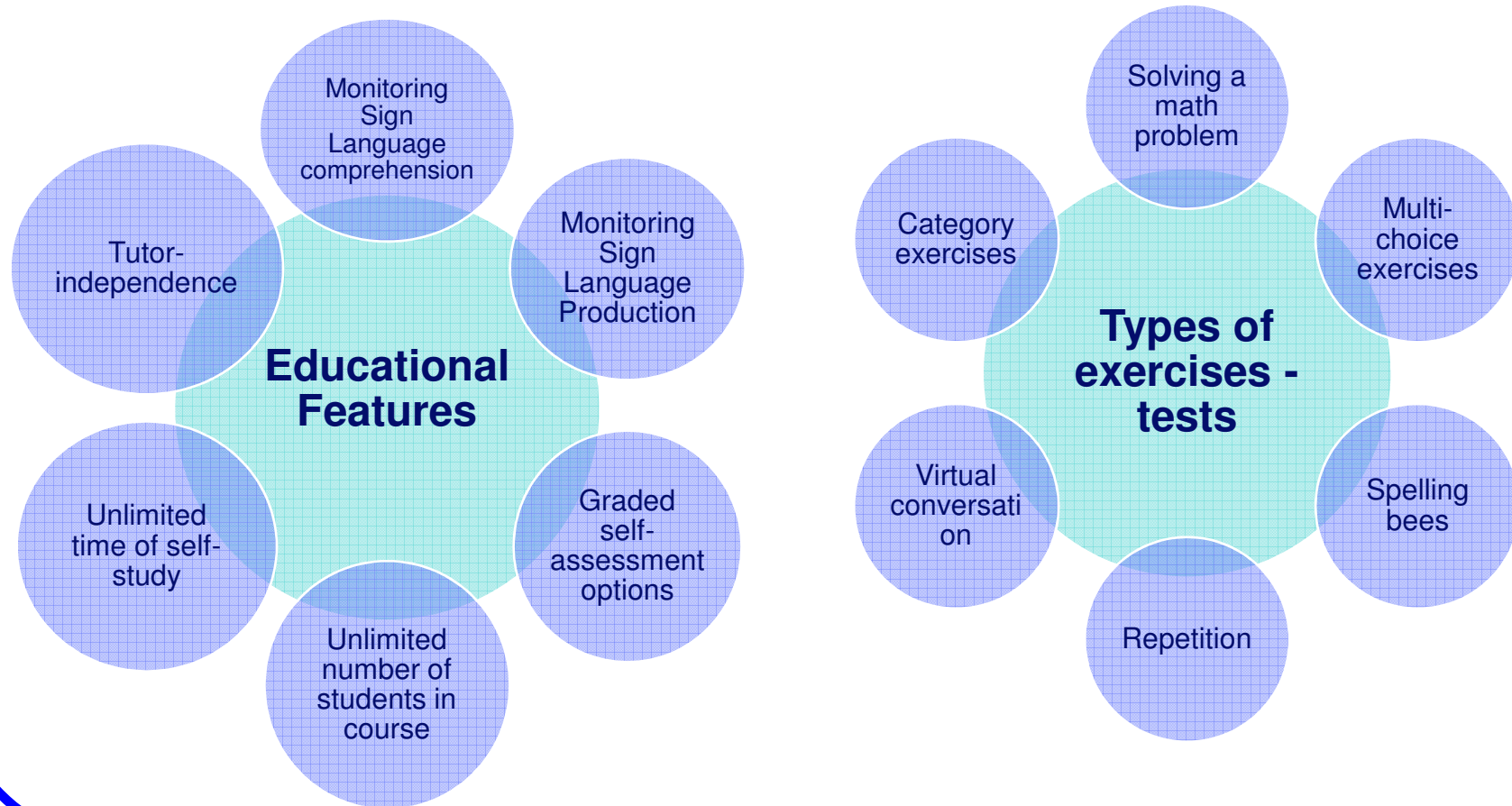
## An innovative project for Greek Sign Language (GSL) as L2 at Tertiary level



## Educational content (A0 and A1 levels of CEFR)



## Features and modules of the SL-ReDu platform

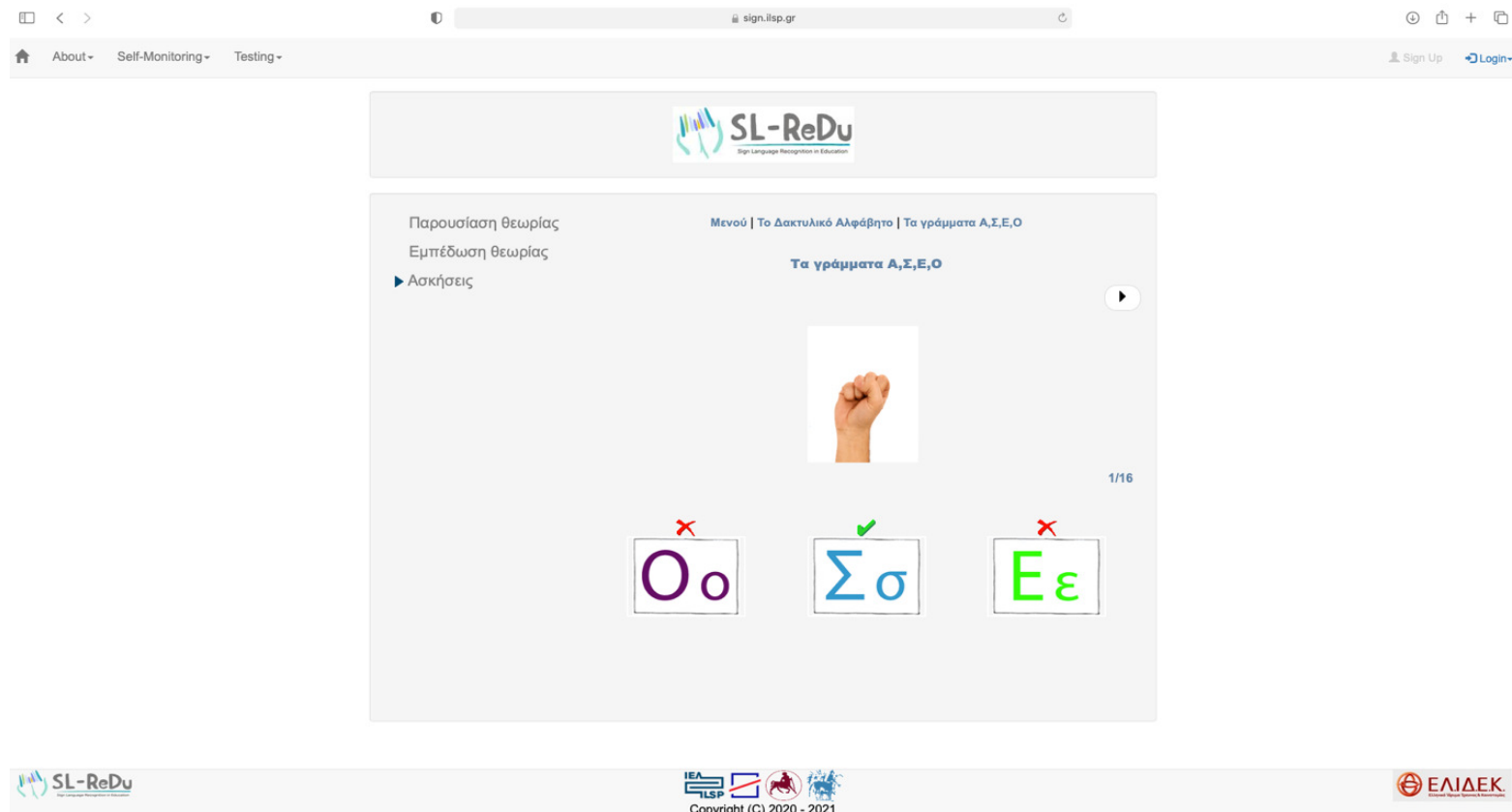


# Sample 1. theory and consolidation mechanism



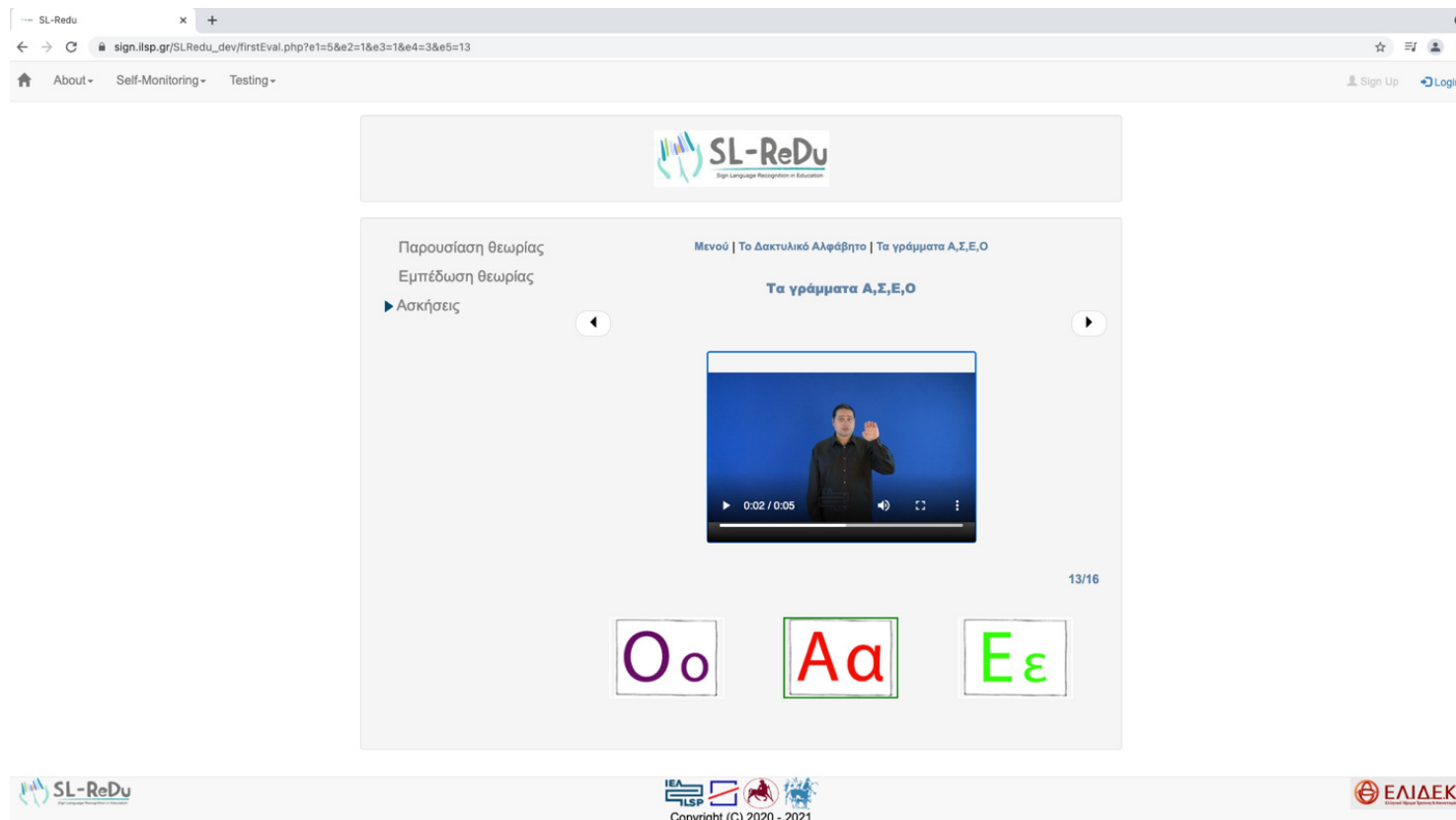
The screenshot shows a web browser window with the URL `sign.ilsp.gr`. The page features a navigation menu with 'About', 'Self-Monitoring', and 'Testing' options. The main content area displays the SL-ReDu logo and a menu with 'Παρουσίαση θεωρίας', 'Εμπέδωση θεωρίας', and 'Ασκήσεις'. The current slide is titled 'Μενού | Το Δακτυλικό Αλφάβητο | Τα γράμματα Α,Σ,Ε,Ο' and 'Τα γράμματα Α,Σ,Ε,Ο'. It includes a hand gesture image, a '1/4' indicator, and three boxes containing the Greek letters Αα, Εε, and Σσ.

## Sample 2. self-monitoring exercise



The screenshot shows a web browser window with the URL `sign.ilsp.gr`. The page title is "Self-Monitoring - Testing". The main content area displays the SL-ReDu logo and navigation links: "Παρουσίαση θεωρίας", "Εμπέδωση θεωρίας", and "Ασκήσεις". The current exercise is titled "Μενού | Το Δακτυλικό Αλφάβητο | Τα γράμματα Α,Σ,Ε,Ο" and "Τα γράμματα Α,Σ,Ε,Ο". A video player shows a hand sign. Below the video, three options are presented in boxes: "Οο" (marked with a red X), "Σσ" (marked with a green checkmark), and "Εε" (marked with a red X). The page number "1/16" is visible in the bottom right corner of the content area. The footer contains the SL-ReDu logo, the ILSP logo, the text "Copyright (C) 2020 - 2021", and the ELIADK logo.

## Sample 3. video based content presentation



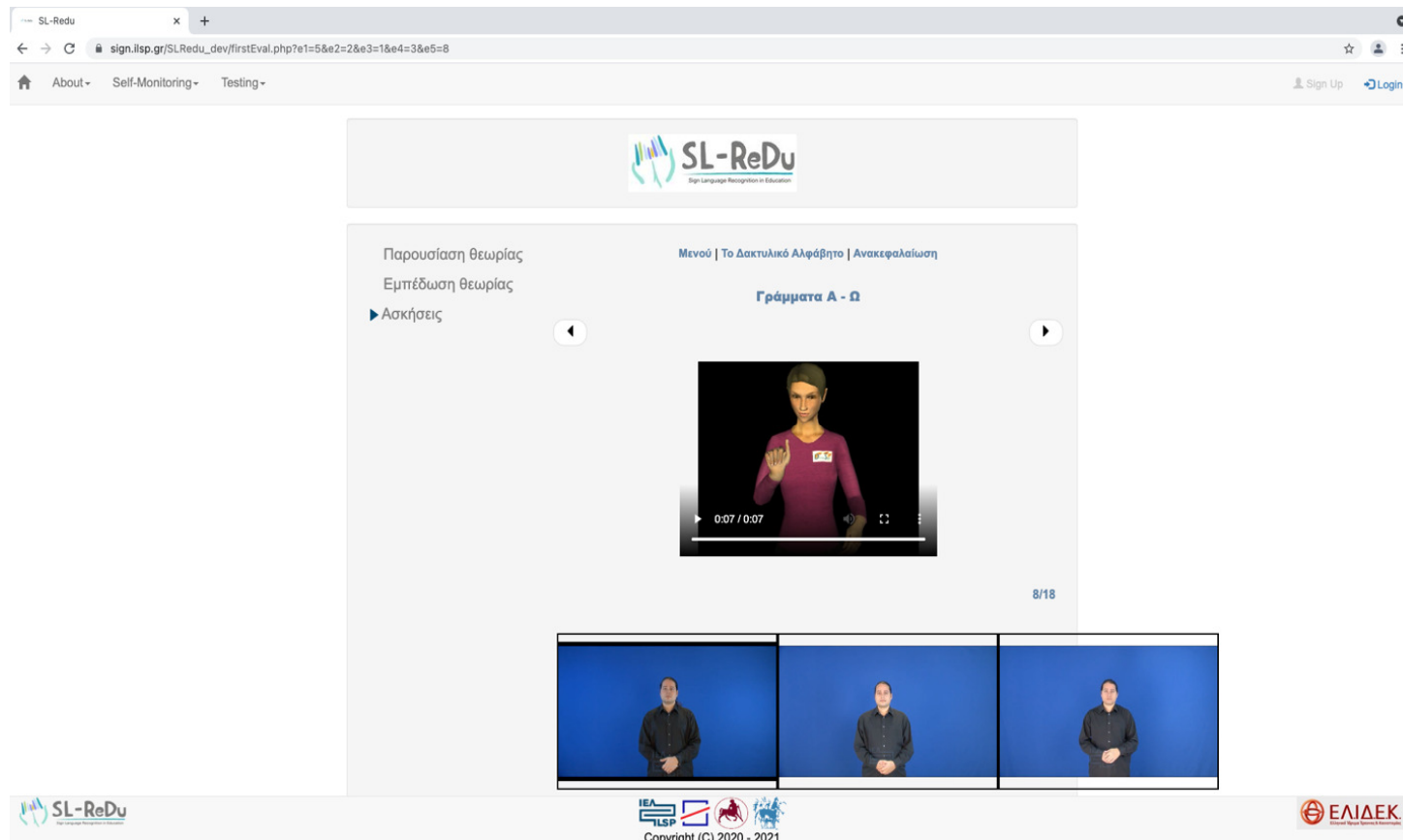
The screenshot displays the SL-ReDu web application interface. At the top, the browser address bar shows the URL `sign.lisp.gr/SLRedu_dev/firstEval.php?e1=5&e2=1&e3=1&e4=3&e5=13`. The application header includes the SL-ReDu logo and navigation links: "About", "Self-Monitoring", and "Testing". A "Sign Up" and "Login" link is also present.

The main content area features a sidebar with the following menu items: "Παρουσίαση θεωρίας", "Εμπέδωση θεωρίας", and "Ασκήσεις". The main content area is titled "Μενού | Το Δακτυλικό Αλφάβητο | Τα γράμματα Α,Σ,Ε,Ο" and "Τα γράμματα Α,Σ,Ε,Ο". A video player is centered, showing a person signing. The video progress bar indicates 0:02 / 0:05. Below the video player, three boxes display the Greek letters "Οο", "Αα", and "Εε". The page number "13/16" is visible in the bottom right corner of the content area.

The footer contains the SL-ReDu logo, the IEA ILSP logo, the Hellenic Republic logo, and the ΕΛΙΑΕΚ logo. The copyright notice reads "Copyright (C) 2020 - 2021".



## Sample 4. video/avatar based content presentation

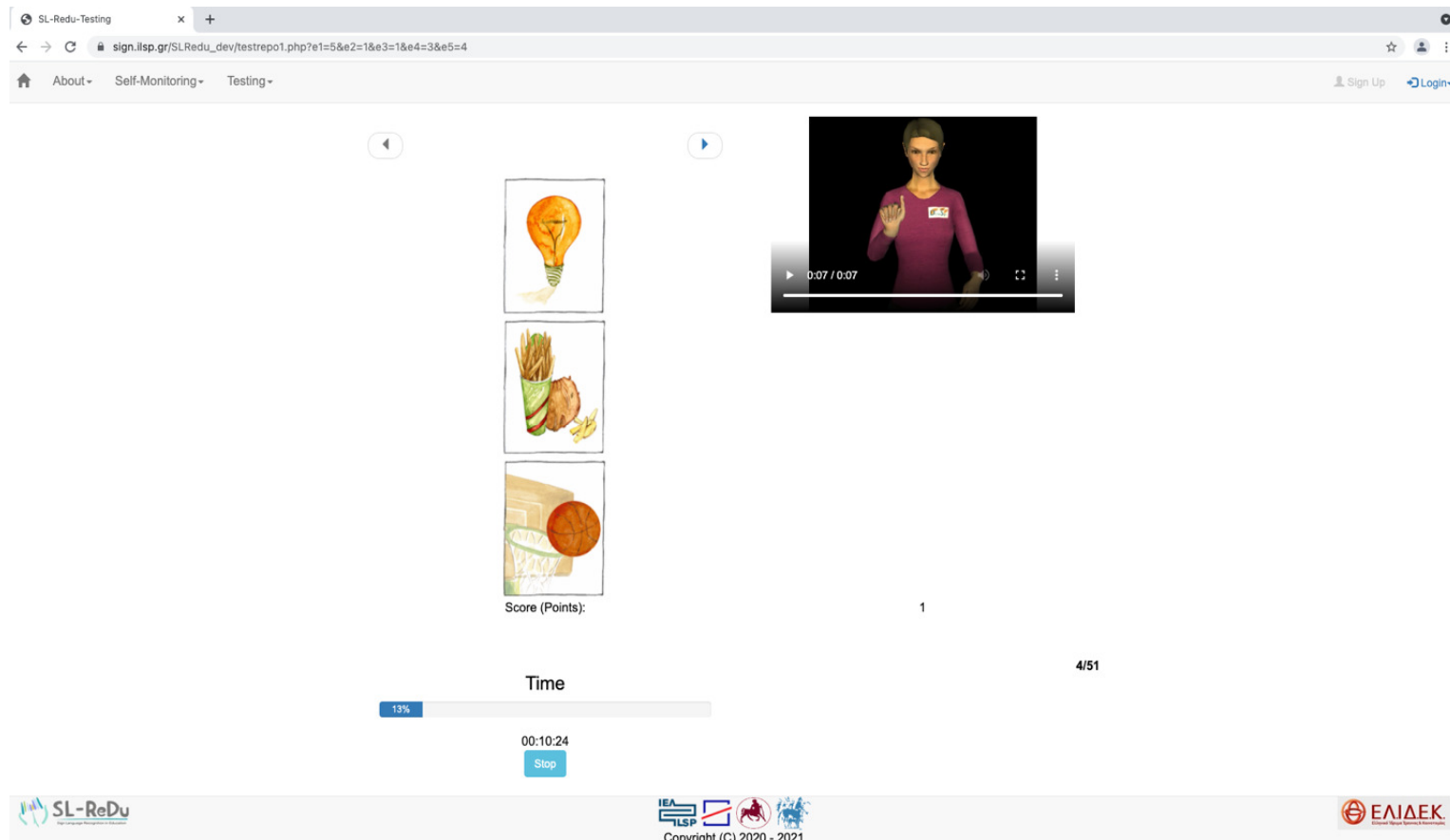


The screenshot displays the SL-ReDu web application interface. At the top, the browser address bar shows the URL `sign.isp.gr/SLRedu_dev/firstEval.php?e1=5&e2=2&e3=1&e4=3&e5=8`. The application header features the SL-ReDu logo and navigation links: "About", "Self-Monitoring", "Testing", "Sign Up", and "Login".

The main content area includes a sidebar with the following menu items: "Παρουσίαση θεωρίας", "Εμπέδωση θεωρίας", and "Ασκήσεις". The main content area displays the text "Μενού | Το Δακτυλικό Αλφάβητο | Ανακεφαλαίωση" and "Γράμματα Α - Ω". A video player is centered, showing a 3D avatar of a woman in a purple top signing. The video progress bar indicates 0:07 / 0:07. Below the video player, there are three small video thumbnails showing a man signing. The page number "8/18" is visible in the bottom right corner of the content area.

The footer contains the SL-ReDu logo, logos for IEA, IASP, and other partners, the text "Copyright (C) 2020 - 2021", and the logo for ΕΜΙΔΕΚ.

# Sample 5. sign perception in time controlled objective evaluation



The screenshot displays the SL-ReDu web application interface. At the top, the browser address bar shows the URL: `sign.ilsp.gr/SLRedu_dev/testrepo1.php?e1=5&e2=1&e3=1&e4=3&e5=4`. The page features a navigation menu with 'About', 'Self-Monitoring', and 'Testing' options. The main content area includes a video player showing a sign language gesture, a vertical list of three icons (a lightbulb, a bundle of sticks, and a basketball), and a 'Score (Points): 1' indicator. A progress bar shows '13%' completion, and a 'Time' section displays '00:10:24' with a 'Stop' button. The footer contains logos for SL-ReDu, IEA ILSP, and EΛIΔΕΚ, along with the text 'Copyright (C) 2020 - 2021'.

## Video recognition in self monitoring & objective assessment of students' linguistic production

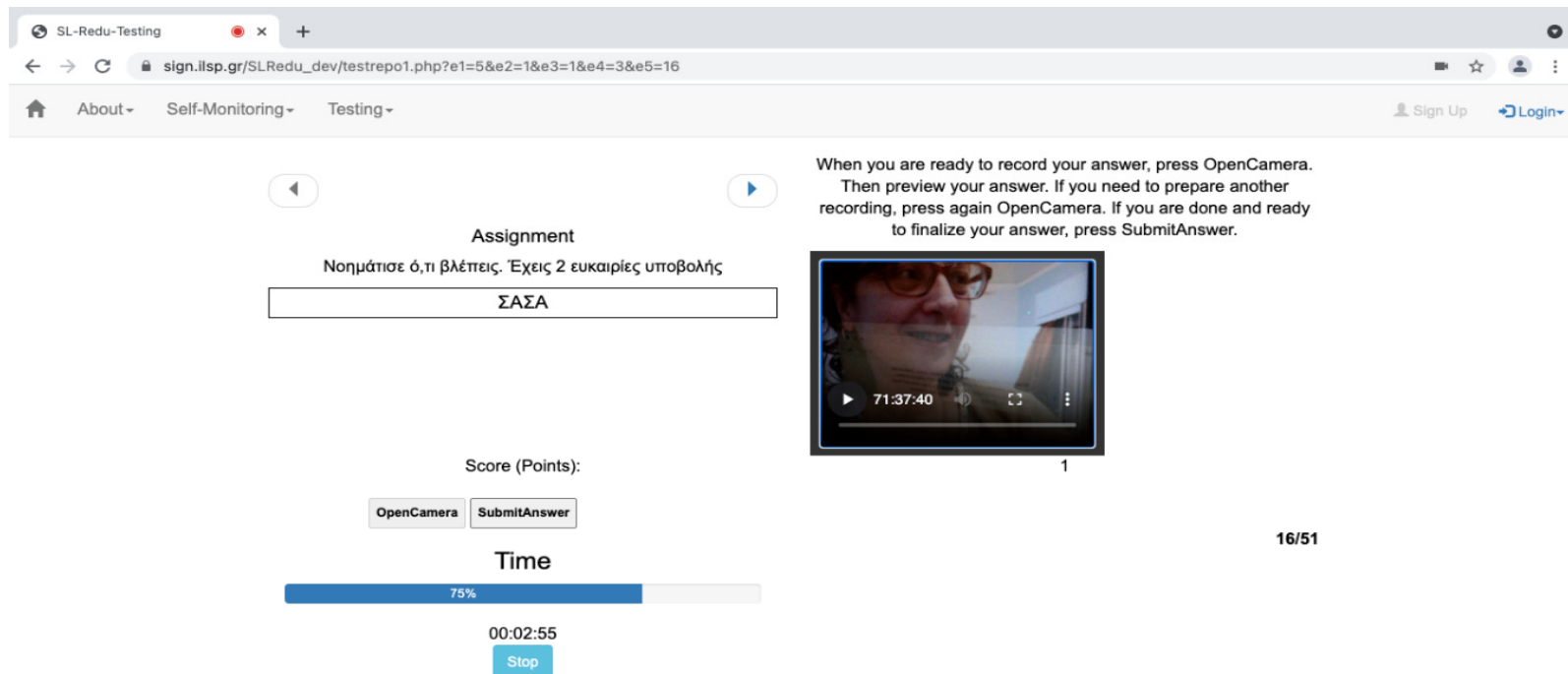
### *Interaction procedure:*

1. A picture, written word or video prompt with instructions appears on the left
2. Permission is asked for the platform to use camera
3. Students record themselves
4. Students preview and revise their production
5. Students upload production
6. Automatic recognition runs
7. A system response of correct, incorrect, or invalid result appears on the student's screen

Automatically recognized signs are formed with the 13 most frequently occurring handshapes in GSL

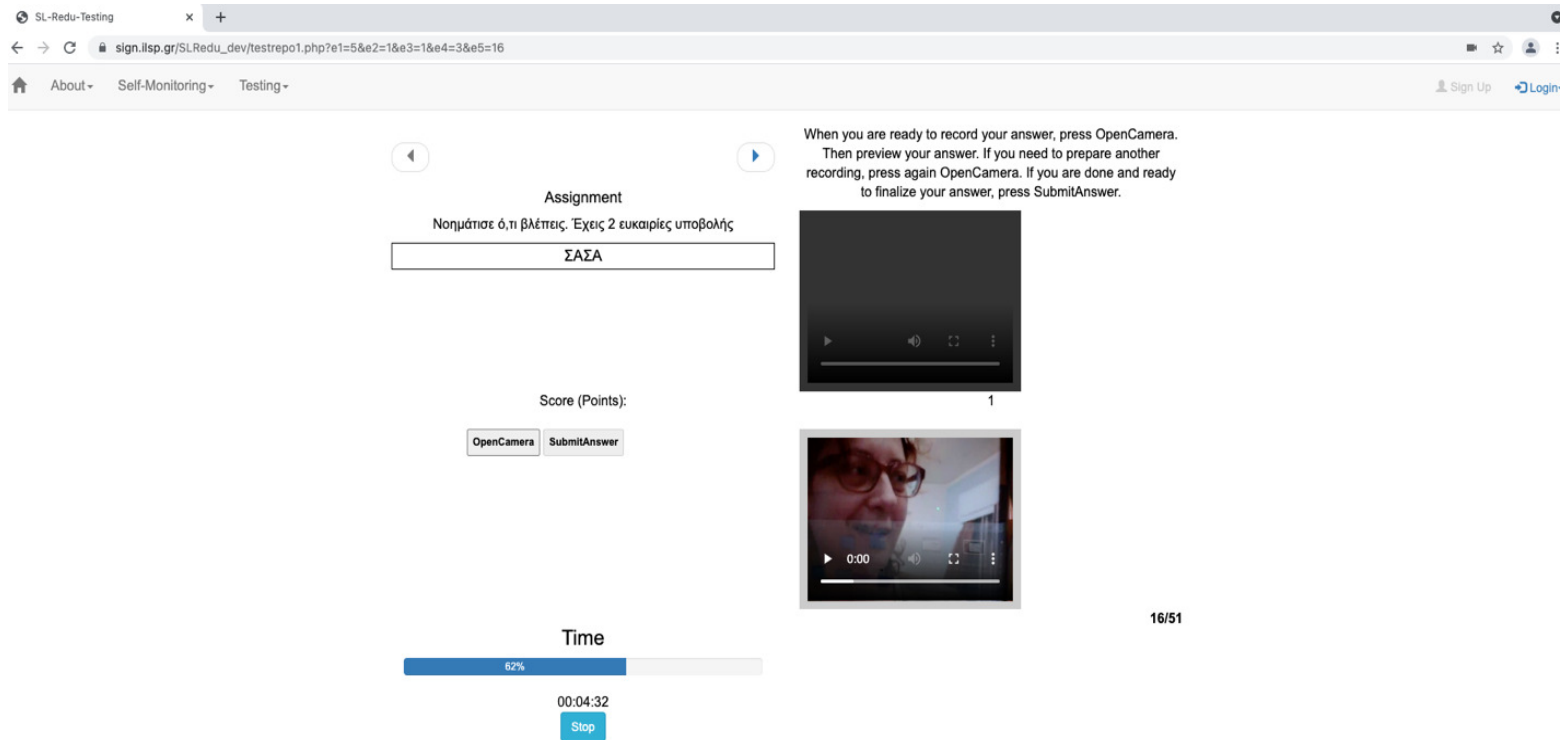


# Sample 6. sign capturing to feed recognition for student performance evaluation



The screenshot shows a web browser window with the URL `sign.ilsp.gr/SLRedu_dev/testrepo1.php?e1=5&e2=1&e3=1&e4=3&e5=16`. The page title is "SL-ReDu-Testing". The navigation menu includes "About", "Self-Monitoring", and "Testing". The main content area displays an assignment titled "Assignment" with the instruction "Νοημάτισε ό,τι βλέπεις. Έχεις 2 ευκαιρίες υποβολής" and the answer "ΣΑΣΑ". Below the answer field, the score is shown as "Score (Points): 1". There are two buttons: "OpenCamera" and "SubmitAnswer". A video player shows a person signing, with a timestamp of "71:37:40". A progress bar indicates "Time" at "75%" with a "Stop" button below it. The page number "16/51" is visible in the bottom right corner.

# Sample 7. student performance verification and submission for recognition



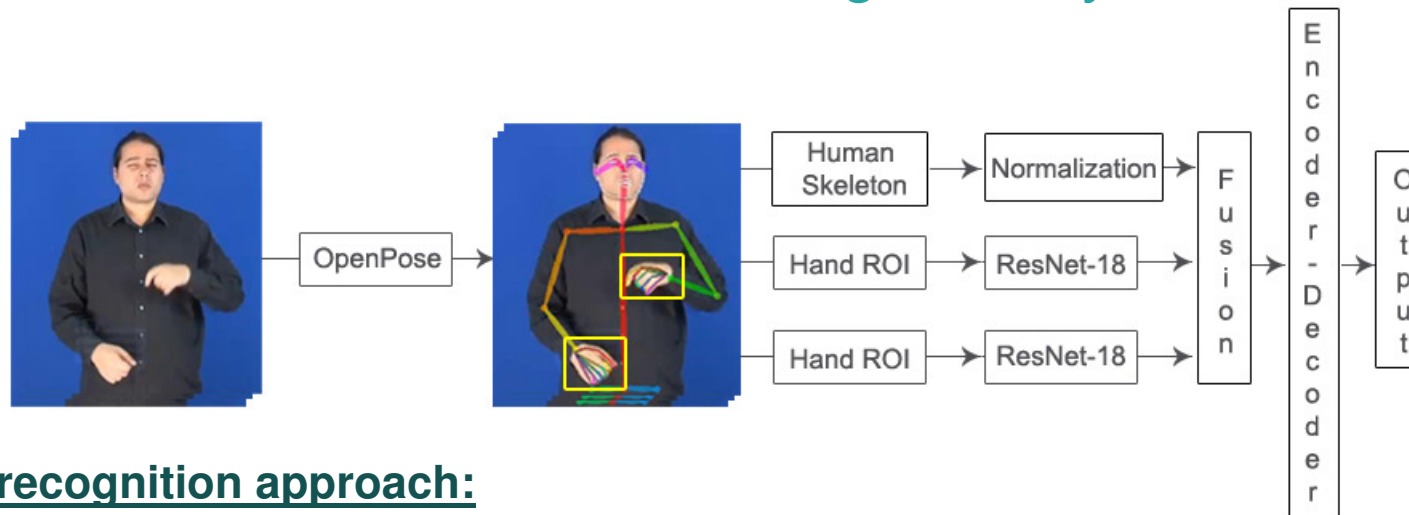
The screenshot shows a web browser window with the URL `sign.itsp.gr/SLRedu_dev/testrepo1.php?e1=5&e2=1&e3=1&e4=3&e5=16`. The page title is "SL-Redu-Testing". The navigation menu includes "About", "Self-Monitoring", and "Testing".

The main content area displays an "Assignment" section with the text "Νοημάτισε ό,τι βλέπεις. Έχεις 2 ευκαιρίες υποβολής" and a text input field containing "ΣΑΣΑ". Below this, the "Score (Points)" is shown as "1". There are two buttons: "OpenCamera" and "SubmitAnswer".

Instructions on the right side of the page read: "When you are ready to record your answer, press OpenCamera. Then preview your answer. If you need to prepare another recording, press again OpenCamera. If you are done and ready to finalize your answer, press SubmitAnswer."

At the bottom, there is a "Time" section with a progress bar at 62%, a timer showing "00:04:32", and a "Stop" button. The page number "16/51" is visible in the bottom right corner.

## The embedded SL recognition system



- **SL recognition approach:**

- ✓ Deep learning-based GSL recognition from videos.
- ✓ Targets **fingerspelling, isolated, continuous** signing.

- **Our approach contains four distinct pillars:**

- ✓ Visual **detection** of SL articulators (**manual / non-manual**).
- ✓ Visual **feature representations** of the articulators.
- ✓ Multi-stream **feature fusion**.
- ✓ An **attentional encoder-decoder** sequence learning for **sign prediction**.

## *Conclusion & Future work*

- \* SL-ReDu HCI implementation is completed
- \* Currently under technical evaluation &
- \* On-going content enrichment
  
- \* User evaluation planned in next academic semester





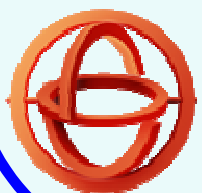
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# THANK YOU!

Questions? pls. contact: [eleni\\_e@athenarc.gr](mailto:eleni_e@athenarc.gr)/[evita@athenarc.gr](mailto:evita@athenarc.gr)

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