**WORD BUILDER GREEK- ΛΕΞΟΚΑΤΑΣΚΕΥΑΣΤΗΣ**

**App name: LEXISMAT (matching)**

**Description:**

The proposed Android/Windows App (**we need to discuss this**) is called **LEXISMAT,** in Greek **ΛΕΞΟΚΑΤΑΣΚΕΥΑΣΤΗΣ. M**ayia**, A**ris and **T**halia (**MAT)** are three young children who have learned how to read Greek AND English at the very young age of three, even earlier, with the help of word building software, and word building cubes similar to this. **ΛΕΞΟΚΑΤΑΣΚΕΥΑΣΤΗΣ** aims at providing a friendly, useful, practical tool to help young children, early readers, nursery school children, children at the first Primary School level, children with Special Needs, slow learners and other persons who are struggling with Phonology and early Reading. The main objective of the App is for users to build words from single letters and/or diphthongs.

**The App provides options to work on four Activities:**

Activity 1, Rapid naming, quickly learning words

Activity 2, Build the word you listen to

Activity 3, Find the missing letters and complete the word

Activity 4, Build as many words as you can in a given time i.e. in 2 minutes or pick a Word set with a number of words see them all, for a while, and try to make them all. Time required to finish will be recorded.

|  |  |  |
| --- | --- | --- |
| **c** | **a** | **t** |

A cat figurine of a cat

Description automatically generated with medium confidenceUser will have to tap on one of A PRESET NUMBER of buttons on the screen. On each button there will be one letter. Buttons to be placed in horizontal sequence (in the middle of the screen) just like in the following picture. By tapping the buttons user will bring up different letters (one at a time), in a sequence. If the user wants to build the word **cat** he will start from the first button. He will tap first button until he finds letter **c. Automatically user will listen to the recorded phoneme of the letter.** After the first letter he will tap on the next button until he finds letter **a** and finally he will tap on the last button until he finds letter **t**. In this way user will make the word **cat** and will immediately listen to the word sound “**cat**” and be rewarded. If the used word (in this case the word **cat**) has also an associated, saved picture/graphic the picture can pop up automatically (option to see or not to see the graphic). Positive and negative feedback (rewards or encouragements in case of mistakes) will be used. User can make more words depending on the given instructions in each of the four types of Activities which we expect that the App will provide. Score will be recorded in most Activities among other data (see report Part).

cat

|  |  |  |
| --- | --- | --- |
| **f** | **a** | **t** |

|  |  |  |
| --- | --- | --- |
| **r** | **a** | **t** |

The goal is to build existing words. Existing words are saved in a database (LEXICON), in a folder and are called in the memory for quick matching so that the words are built with the help of the screen buttons. There is option from a Configuration file to use extra letter/s to distract the user or to miss letters on the screen. A list of Greek words (LEXICON), as well as the alphabet letters (consonants, vowels, diphthongs) will be provided to the programmer with their recorded sounds (phonemes’ sounds, diphthong sounds, or words’ sounds as well as some instructions’ sounds). For most of the words there will also be a graphic (picture, photo, symbol, other) saved in the LEXICON database.

The software to allow user to add more words. For each word, there is a need to save the unique code of the word (keyfield i.e. 1, this can be generated automatically), the word in written form i.e. **baby**, the sound of the word (babywavsound) and a picture or gif animation (the graphic). For words which might not have a corresponding graphic picture to be optional.

The first version of the App will be in Greek but it is important for the App to be easy to localize in other languages. This might mean to have a database with written messages and sounds to be adapted in the new language.

**Words file structure: Code, wordname$, wordsound$, wordpict$**

1, “baby”, baby.wav, babypic.jpg

2, “make”, make.wav, makepic.gif

3, …………….., ………, ……………..

**How does the App work:**

**We need** an icon with the **App name** (**ΛΕΞΟΚΑΤΑΣΚΕΥΑΣΤΗΣ**) on the DESKTOP screen of the Tablet, Android Phone, or other Android Device. By tapping on the icon user to be sent the **STARTUP Screen** of the App. There will be ten screens, probably one or two more.

1. **Icon on Desktop screen**
2. **STARTUP Screen**
3. **Configurations**
4. **Play Activity 1 Screen-Rapid naming**
5. **Play Activity 2 Screen-Build the whole Word**
6. **Play Activity 3 Screen-Find the missing letter/s**
7. **Play Activity 4 Screen-Build as many words as possible**
8. **Manage Words Screen**
9. **Reports’ Screen**
10. **App info Screen.**
11. **STARTUP screen**

The screen is separated in two Parts:

**Teachers’ Part:** Part to register/LOGIN Parent or Teacher. We can call this ADMINISTRATOR

* Do you want to LOGIN? Y/N? If the answer is Y then ADMINISTRATOR will see the list of registered ADMINISTRATORS.
* He must select his User Id or the SESAT default ADMINISTRATOR Id and type the corresponding password to Login. The password for SESAT to be 0000, the email is: [sesses@cytanet.com.cy](mailto:sesses@cytanet.com.cy). If the password is correct, then message: **Successful Login you can now start working.**

**ADMINISTRATOR’S** **file structure: Code, Adminid$, Adminrpassword$, emailofAdmin$,**

**DEFAULTCONFIG$** Code is generated automatically by the system and the default

Configuration file is added at the end of the record.

**Examples of ADMINISTRATORS records:**

* 1, “SESAT”, 0000, “[sesses@cytanet.com.cy](mailto:sesses@cytanet.com.cy)”, “DEFAULTCONFIG”
* 2, “NORA”, 2345, “noramak@cytanet.com”, “NORACONFIG”
* 3, “MIKE”, 4422, “lamonet@cytanet.com.cy”, “MIKECONFIG”
* 4, ……………, ………, …………………………………………., …………………….
* If the answer is N then the Registration process starts: Type your user id, Insert your password, Type your email here: The system will automatically add the DEFAULTCONFIG file at the end of the ADMINISTRATOR’S record.
* Press on SAVE button to save the new codes. The system sends an email with the codes to the email of the new ADMINISTRATOR.
* After SAVE the Drop-Down list of ADMINISTRATORS is refreshed.
* **You can now start working.**
* Button to go to Configuration Screen. Only Administrators can use this button.
* Button to go to Manage Words Screen. On the Manage Words Screen (Add Words, delete, update, save words). Only Administrators can use this button.
* Reports’ Button, to visit Results Screen. This Screen can be accessed by both the User and the ADMINISTRATOR.
* A button with info about the App. This will lead to a screen where information about the Application, the developers, the version can be found.
* Button to work with Activity 1. Teacher can go to Activity 1 and work like a child or other user.
* Button to work with Activity 2. Teacher can go to Activity 1 and work like a child or other user.
* Button to work with Activity 3. Teacher can go to Activity 1 and work like a child or other user.
* Button to work with Activity 4. Teacher can go to Activity 1 and work like a child or other user.
* EXIT button if required to stop using the App.

**Student’s Part:** Register**/LOGIN USER**, where user can see the following buttons:

* Message please **login** first and then if you want you can select a **configuration** file to use. If user does not select a configuration file DEFAULTCONFIG configuration will be used or the last configuration file, he/she has used will help the user with the Activities. A list of configurations exists for the user to select from. If user does not select any configuration, then the system will start with the last used configuration. If user has not used a different configuration before then the default configuration DEFAULTCONFIG will be used instead.
* Button Login Child/User: Next to this button there is a Drop-Down list of registered users. The list has only the users’ names. User must select his/her username if he/she is already registered and to type his password. If the password is correct, then a message pops up saying **Correct** you can select a configuration file if you want and you can start working with Activities. The child will work with his/her credentials (**User id and Password**).
* Button do you want to Register? Y/N If the answer is Y then the system provides options to the child/user to add a new record: i.e. New record number 2 (automatically generated by the system), NIKI user id, 1234 password, 2012 year born, F gender and a Configuration file selected from the list.
* If the answer is N then the child will see the 3 Activities’ Buttons to start working with the default credentials (1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”)
* **Users’ file structure: Code, Userid$, password$, Yearofbirth, Gender, lastusedconfiguration$**
* Default User name: 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”. By tapping on this button, the child will start working immediately:

**Examples of users’ records:**

* 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”
* 2, “DOLLY”, 2345, 2206, “F”. “DOLLYCONFIG”
* 3. “ANDREW”, 6666, 2210, “M”, “ANDREASCONFIG”
* 4, ………….., ………, …………., ……………………………..
* Button saying: Play Activity 1. By pressing this the child/user will use the default USER settings. Default User name: 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”. By tapping on this button the child will start working immediately.
* Button saying: Play Activity 2. By pressing this button the child/user will use the default USER settings: Default User name: 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG” By tapping on this button the child will start working immediately.
* Button saying: Play Activity 3. By pressing this button the child/user will use the default USER settings: Default User name: 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”. By tapping on this button the child will start working immediately.
* Button saying: Play Activity 4. By pressing this button the child/user will use the default USER settings: Default User name: 1, “NAKIS”, 1111, 2008, “M”, “DEFAULTCONFIG”. By tapping on this button the child will start working immediately.

1. **Configuration Screen:**

A configuration file (called DEFAULTCONFIG) needs to be developed with default values. The DEFAULTCONFIG Configuration file opens on this form (**form 3**) and presents the default values so that the ADMINISTRATOR (not the user) can make changes and save it as a different NEW configuration file. If the user makes any single change and tries to EXIT to be given the chance to Discard changes or to Name and Save the Configuration as a **New Configuration file.** **Original DEFAULTCONFIG configuration file cannot be DELETED cannot be renamed.**

ADMINISTRATOR will have to name the new Configuration file which will be saved in a Drop-Down list of configurations for the users to select one. Only ADMINISTRATOR to be able to delete any configuration file except the DEFAULTCONFIG file. Of course when a ADMINISTRATOR deletes a configuration file he/she should be warned: **Do you want to delete this file Y/N?**

If a user does not want to use a new Configuration file, the App will work with the DEFAULTCONFIG configuration file. If the user has worked before with any Configuration file each time, he/she starts the Application again he/she will automatically work with the last Configuration file used UNLESS IF HE/SHE SELECTS A NEW ONE.

ADMINISTRATOR can see the following options on the **Configurations’ Screen.**

1. Go Back button for the ADMINISTRATOR to Go back to the Startup Screen. By clicking on this button ADMINISTRATOR will Go back to Startup Screen. User is asked to confirm the selected Configuration File. Will you use this configuration file Y/N. If N is selected, then the system will select the DEFAULTCONFIG file or the last used Configuration file. Selection is done from a Drop-Down list.
2. Rename and edit a file from the Configuration Drop-Down list. Rename and or Edit an existing configuration Y/N. If Y is selected then the Drop-Down list with existing configurations opens. ADMINISTRATOR will select from the Drop-Down list of configurations a file to modify and rename. He/she can change values. SAVE button required, UPDATE button is required, RENAME button is also required.

Note that the DEFAULTCONFIG file can be selected only to save **as a NEW file.** If DEFAULTCONFIG is selected from the Drop-Down list a Message to popup **“You are not allowed to rename the Default Configuration file. You can save it with a different name and make any modifications you wish on the new file.” Save as a new Configuration file Y/N.**

**The Configurations’ screen has the following Buttons/Controls and default values which can be changed:**

1. Go Back Button to go to the StartUp screen
2. EXIT button to stop the App completely
3. DROP-DOWN List of existing Configurations
4. Select and Rename a file
5. EDIT or UPDATE a Configuration file, CHANGE values
6. SAVE Configuration as a new file
7. Delete Configuration Y/N option (**except the DEFAULTCONFIG**)
8. Option to see the word written ON or OFF
9. For how long to see the word? 2 seconds Default time but can also be changed
10. Option to get help and listen to the word ON or OFF
11. Option to see the graphic/pic ON or OFF
12. For how long to see the graphic? 2 seconds (Default time, to be changed)
13. Option to have several distracting letters Default is 2 letters which are different than the

letters in the word, option for 0 as well. The total number of letters not to exceed number 8

1. Flashing light on the button Light blue (default), to select a new colour
2. Background colour of buttons with letters Grey is the default, to be changed
3. Number of buttons 4 default, maximum up to 8, to be changed
4. Number of missing letters 1 is the Default. Number of missing letters is decided in the configuration file. The number of missing letters can be the number of the letters in the word minus one. i.e. if the word has 7 letters then up to any 6 letters can be missing.
5. Number of words 10 default (option for 5 or 10 or 15 or 20 words)
6. A drop-Down list of word sets
7. Different words’ sets are ready or are developed by the user. User can pick a ready words’ set to use.
8. Selected words to be added in the configuration file. i.e. : vat, rat, sat, had, fat, rat, pat, mat, bat, cat.
9. Duration time to complete activity 0 (starts at 0), to be counted in minutes and seconds
10. Acceptance time after tapping on a letter 2 seconds is the default, but can be changed
11. Consonants font colour black is the default, to be changed
12. Vowels font colour red is the default, to be changed
13. Diphthongs font colour red is the default, to be changed
14. Sound of letters (phonemes) ON or OFF
15. Speak the word when word is completed ON or OFF
16. Font series Default to be Tahoma, to be changed
17. Font size Medium, to be changed
18. Background (frame) Activities’ colour Light orange, to be changed
19. Reward type (positive) Visual or Auditory or both or nothing Ο/Α/Δ/Κ
20. Negative feedback Visual or Auditory or both or nothing Ο/Α/Δ/Κ
21. Score, starts from 0 increases always by 10
22. Time of words on screen Default 5 seconds, but can be changed
23. Date Device (telephone, tablet,..) Date
24. Option to see score Y/N Default is Υ
25. Option to see duration time Y/N Default is Υ
26. Button Time interval, for Rapid Naming Default is 2 seconds (this for Activity 1)

The screen provides option for the user to save the NEW configuration file or an updated Configuration file.

The above can be changed and saved as configuration sets. Each configuration set is given a new name and added to the Drop-Down Configurations List.

1. **Play Activity 1 Screen (Rapid naming, write words on your notebook)**

On this screen users can see different controls based on the configuration file:

The system calls, in RAM the different Databases like: DEFAULTCONFIG or the selected Configuration file, DROP-DOWN List of users, DROP-DOWN list of configuration files, Drop down List of sets of Words, Words in written form, words’ sound, graphic of each word to be used, The list of all words (LEXICON), List of positive Feedbacks (graphics and sounds), List of Negative Feedbacks (graphics and sounds), List of phonemes with list of their sounds, list of consonants with list of their sounds, list of vowels with list of their sounds, list of diphthongs with list of their sounds.

**The screen of Activity 1** is for the user to listen, speak out, see, read and if he/she wants to type on his/her notebook some or all the words, from the LEXICON list.

* Automatic running ON/OFF button so that words will be presented the one after the other automatically or not, based on Time interval
* PLAY button to start the Activity. Words are shown the one after the other depending on the Automatic Button selection (ON or OFF)
* Report logging starts
* Score is set to 0. Score is not changing on this Activity.
* The system picks the Central Word List (LEXICON) and shows randomly one word at a time based on preset time interval. As soon as the screen opens user listens to the word, randomly picked, sees the written form of the word as well as the graphic/pic that is associated with the word.
* Size of buttons is auto resized depending on their number
* Number of taps is set to 0, taps’ number increases each time left or right arrows are tapped.
* Pause/Start again Button for the user to freeze the running of the Activity
* Button + to make size of buttons bigger
* Button - to make size of buttons smaller
* Button word sound ON/OFF
* Also shows the graphic of the word
* Button graphics ON/OFF
* Also shows the written form of the word
* Button Written Word ON/OFF
* Button + Time interval, to increase by a second the time interval
* Button - Time interval, to decrease by a second the time interval
* Next button (to see next word). This when Automatic running is disabled. User will also listen to the word sound and see the written form of the word as well as the graphic.
* Back button (to see previous word). This when Automatic running is disabled. User will also listen to the word sound and see the written form of the word as well as the graphic.
* Listen to word again button
* The word pops - up under the graphic and goes off in a while.
* A frame in the middle of the screen shows the word written on buttons. See the frame as in Page 1.
* Colour of the background of the frame is light orange (by default or as selected).
* Upon completion of the words (completion of the Activity), the system records in the Reports file.
* Duration button shows time elapsed by the time the user started working.
* BACK button to go back to the Startup Screen.

1. **Play Activity 2 Screen – Build the whole Word**

On this screen users can see different controls based on the configuration file:

The system calls, in RAM the different Databases like: DEFAULTCONFIG or the selected Configuration file, DROP-DOWN List of users, DROP-DOWN list of configuration files, Drop down List of sets of Words, words in written form, words’ sound, graphic of each word to be used, The list of all words (LEXICON), List of positive Feedbacks (graphics and sounds), List of Negative Feedbacks (graphics and sounds), List of phonemes with list of their sounds, list of consonants with list of their sounds, list of vowels with list of their sounds, list of diphthongs with list of their sounds.

1. BACK button to go back to the Startup Screen
2. Exit button to Exit completely from the Application if needed
3. Report logging starts
4. Score is set to 0
5. Duration is set to 0
6. Number of taps is set to 0 and will increase by one each time the user taps on a letter button
7. Number of words to be used are selected based on the criteria set in the Configuration file and placed in a temporal file (words set selected).
8. A label with the name of the Configuration file
9. Next to this label user can see the score
10. A frame in the middle of the screen includes an arrow on top of the first button. The arrow moves on top of the next one as soon as the first one was selected successfully
11. Colour of the background of the frame is light orange (by default or as selected)
12. In this frame (**see Page 1**) there is an area for the graphic (pic of the word) to be shown.
13. Under the graphic a label to show the word in a written form (**see Page 1**). The word will disappear after some time (this time, is decided in the configuration file). By tapping on this label the word can be shown again and stay for a short time for the user to see.
14. As soon as the screen opens user listens to a word randomly picked from the words-set (set of 5 or 10, 0r15 or 20), that was selected in the configuration file
15. Help button to listen to the instruction and the picked word i.e. “Built the word…”cat”. The graphic of the word (if there is one) pops – up on the screen and goes off in a while
16. The word pops - up under the graphic and goes off in a while
17. Listen to word again button
18. See word again button
19. See graphic again button
20. Button Start the word again. This in case user made a mistake. In this case all buttons become clear, and the arrow moves on top of the first button.
21. Some distracting letters will pop up on the buttons of the word when tapping on them. User should act quickly and tap again to avoid accepting the distracting letter as a correct letter.
22. Select a new word set and play again. Score, Duration and Number of Taps are set to 0 in this case. A button allows for a list of word lists to select and use as new word list.
23. User moves to next button to tap to find the next letter in the word. Once the user selects all the correct letters of the word the graphic will be presented, the word will be shown under the graphic and spoken out as well.
24. Upon completion of all the words (completion of the Activity), the system records in the Reports file, Shows the Score, Number of Taps and Duration of the Activity.
25. Score button, Score is increased by ten when a word is completed successfully. Final score might be different though. A formula is needed to estimate the score also considering the completion time and the Taps’ number.
26. Duration button. A timer works and records time required to complete the list of the selected words. Duration Timer will start from 0.
27. Button + to make size of buttons bigger
28. Button - to make size of buttons smaller
29. Listen again button, user will listen to the word to be built.
30. Randomly one of the words (from the Words’ set)selected is put in RAM. Word is split in its letters, vowels need to be identified as they will be in red colour, same with diphthongs (red colour again). Letters are shuffled and placed on the buttons. (Distracting letters are selected).
31. First empty button starts flashing in light blue or in the colour that was selected in the Configuration file
32. Size of buttons is auto resized depending on their number
33. Number of buttons to be shown is decided in the **DEFAULTCONFIG** file. Buttons are placed horizontally the one next to the other.

**How the Activity works:**

* User listens to a voiced instruction: Build the selected word (buildwordinstruction$, a sound file)
* If the option of See the graphics is YES (in the Configuration file) then the picture/graphic is also presented on the screen. In case that a graphic does not exist then nothing to be shown in the graphics area.
* Soon after this sound the user will listen to the word to be built.
* User taps on the first button once and a letter pops up on the button. If the letter is the correct letter, then the user waits until the arrow moves on top of the next empty button.
* User must tap again to find the correct second letter of the word. This happens until the user successfully completes the word. The word will be spoken out. And a next word comes in.

1. **Play Activity 3 Screen, the missing letter, or letters**

On this screen users can see different controls based on the configuration file:

The system calls, in RAM the different Databases like: DEFAULTCONFIG or the selected Configuration file, DROP-DOWN List of users, DROP-DOWN list of configuration files, Drop down List of sets of Words, words in written form, words’ sound, graphic of each word to be used, The list of all words (LEXICON), List of positive Feedbacks (graphics and sounds), List of Negative Feedbacks (graphics and sounds), List of phonemes with list of their sounds, list of consonants with list of their sounds, list of vowels with list of their sounds, list of diphthongs with list of their sounds.

1. BACK button to go back to the Startup Screen
2. Exit button to Exit completely from the Application if needed
3. Report logging starts
4. Score is set to 0
5. Duration is set to 0
6. Number of taps is set to 0 and will increase by one each time the user taps on a letter button
7. Number of words to be used are selected based on the criteria set in the Configuration file and placed in a temporal file (word set selected).
8. A label with the name of the Configuration file
9. Next to this label user can see the score
10. A frame in the middle of the screen includes an arrow on top of the first empty button. Under the arrow user can see the word with one or more missing letters. The arrow moves on top of the next empty button as soon as the first one was selected successfully.
11. Colour of the background of the frame is light orange (by default or as selected)
12. In this frame (**see Page 1**) there is an area for the graphic (pic of the word) to be shown.
13. Under the graphic a label to show the word in a written form (**see Page 1**). The word will disappear after some time (this time, is decided in the configuration file). By tapping on this label the word can be shown again and stay for a short time for the user to see.
14. As soon as the screen opens user listens to a word randomly picked from the words-set (set of 5 or 10, 0r15 or 20), that was selected in the configuration file
15. Help button to listen to the instruction and the picked word i.e. “Built the word…”c-t”. The graphic of the word (if there is one) pops – up on the screen and goes off in a while
16. The complete word pops - up under the graphic and goes off in a while
17. Listen to word again button
18. See word again button
19. See graphic again button
20. Button Start the word again. This in case user made a mistake. In this case all buttons become clear, and the arrow moves on top of the first button.
21. Some distracting letters will pop up on the buttons of the word when tapping on them. User should act quickly and tap again to avoid accepting the distracting letter as a correct letter.
22. Select a new word set and play again. Score, Duration and Number of Taps are set to 0 in this case. A button allows for a list of word lists to select and use as new word list.
23. User moves to next button to tap to find the next empty letter in the word. Once the user selects correctly all the missing letters of the word the graphic will be presented, the word will be shown under the graphic and spoken out as well.
24. Upon completion of all the words (completion of the Activity), the system records in the Reports file, Shows the Score, Number of Taps and Duration of the Activity.
25. Score button, Score is increased by ten when a word is completed successfully. Final score might be different though. A formula is needed to estimate the score also considering the completion time and the Taps’ number.
26. Duration button. A timer works and records time required to complete the list of the selected words. Duration Timer will start from 0.
27. Button + to make size of buttons bigger
28. Button - to make size of buttons smaller
29. Listen again button, user will listen to the word to be built.
30. Randomly one of the words (from the Words’ set) selected is put in RAM. Word is split in its letters, vowels need to be identified as they will be in red colour, same with diphthongs (red colour again). Letters are shuffled and placed on the buttons. (Distracting letters are selected).
31. First empty button starts flashing in light blue or in the colour that was selected in the Configuration file
32. Size of buttons is auto resized depending on their number
33. Number of buttons to be shown is decided in the **DEFAULTCONFIG** file. Buttons are placed horizontally the one next to the other.
34. Number of missing letters is also decided in the **DEFAULTCONFIG** file.

**How the Activity works:**

* Several letters do not show on the buttons and the user needs to find the missing letters.
* Number of missing letters is decided in the configuration file. The number of missing letters can be the number of the letters in the word minus one. i.e. if the word has 7 letters then up to any 6 letters can be missing.
* User listens to a voiced instruction: Build the selected word (buildwordinstruction$, a sound file).
* If the option of See the graphics is YES (in the Configuration file) then the picture/graphic is also presented on the screen. In case that a graphic does not exist then nothing to be shown in the graphics area.
* Soon after this sound the user will listen to the word to be built.
* Some of the letters of the word are missing, the rest are shown on the buttons.
* User taps on the first empty button once and a letter pops up on the button. If the letter is the correct letter, then the user waits until the arrow moves on top of the next empty button.
* User must tap again to find the correct second missing letter of the word. This happens until the user successfully completes the word. The word will be spoken out. And a next word comes in.

1. **Play Activity 4 Screen-Build as many words as possible**

On this screen users can see different controls based on the configuration file:

The system calls, in RAM the different Databases like: DEFAULTCONFIG, THE LAST USED CONFIGURATION or the selected Configuration file, DROP-DOWN List of users, DROP-DOWN list of configuration files, Drop down List of sets of Words, words in written form, words’ sound, graphic of each word to be used, The list of all words (LEXICON), List of positive Feedbacks (graphics and sounds), List of Negative Feedbacks (graphics and sounds), List of phonemes with list of their sounds, list of consonants with list of their sounds, list of vowels with list of their sounds, list of diphthongs with list of their sounds.

1. BACK button to go back to the Startup Screen
2. Exit button to Exit completely from the Application if needed
3. Next word button for the user to go to a next word
4. Score is set to 0 and increases each time user completes a correct word.
5. Duration is set to 0
6. Number of taps is set to 0 and will increase by one each time the user taps on a letter button
7. Number of words to be used are the words in the LEXICON database
8. A label with the name of the file “word set to be used”
9. On the top of the screen there are buttons with numbers 3, 4, 5, 6, 7, 8. By tapping for example on number 3, the button is highlighted, the system will collect and show on the screen all the words (from the LEXICON) which have only 3 letters (i.e. φως, ένα, δύο, εδώ, όπα, …). User can see these words at any time by pressing again on number 3. Words will stay on screen for certain time decided in the Configuration file **Time of words on screen**
10. A frame in the middle includes the number of buttons which the system has selected randomly (i.e. 4 letters, i.e. 6 letters), in this case only 3 buttons.
11. Colour of the background of the frame is light orange (by default or as selected)
12. In this frame (**see Page 1**) there is an area for the graphic (pic of the word) to be shown.
13. Under the graphic a label to show the word in a written form, after the word was successfully completed. (**see Page 1**).
14. Help button to listen to the instruction and the picked word i.e. “Built as many words as possible.
15. Each successfully completed word pops - up under the graphic and goes off in a while
16. User moves to any button and taps until he/she finds one of the words. Words already completed are removed from the temporal words’ set.
17. Once the user selects all the correct letters of the word the graphic will be presented, the word will be shown under the graphic and spoken out as well.
18. Upon completion of all the words (completion of the Activity), the system records in the Reports file, Shows the Score, Number of Taps and Duration of the Activity (**see Report Screen**).
19. Score button, Score is increased by ten when a word is completed successfully. Final score might be different though. A formula is needed to estimate the score also considering the completion time, the times that the user has asked to see the words set, and the Taps’ number.
20. Duration button. A timer works and records time required to complete the list of the selected words. Duration Timer will start from 0.
21. Button + to make size of buttons bigger
22. Button - to make size of buttons smaller
23. Randomly one of the words (from the Words’ set) selected is put in RAM. Word is split in its letters, vowels need to be identified as they will be in red colour, same with diphthongs (red colour again).
24. Size of buttons is auto resized depending on their number.

**How the Activity works:**

* Report logging starts
* On the top of the screen there are buttons with numbers 3, 4, 5, 6, 7, 8 all with same colour. By tapping for example on number 3, the button is highlighted and remains so until another button is selected. The system will collect and show on the screen all the words (from the LEXICON) which have only 3 letters (i.e. φως, ένα, δύο, εδώ, όπα, …) and produce a Temporal list of words. User can see these words at any time by pressing again on number 3. Words will stay on screen for certain time decided in the Configuration file **Time of words on screen**
* User listens to a voiced instruction: “Build all the words”.
* A timer starts
* User can tap on any letter button. On this screen there is no arrow on top of the letters.
* As soon as the buttons are filled with letters system checks the word built if this matches to a word from the temporal list. Even if the word exists in the language if this word is not in the LEXICON (in the Temporal file) the App will not respond.
* When an existing word is completed successfully then If the option of See the graphics is YES (in the Configuration file) then the picture/graphic is also presented on the screen. In case that a graphic does not exist then nothing to be shown in the graphics area.
* User will listen to the word and will tap on the Next word button to try to build another word.
* Word stays on the button until the child taps on the Next word Button.
* Each completed word is removed from the temporal list of words until all words are built.
* Message at the end saying Congrats you have managed to complete all the words in so many minutes and so many seconds.

1. **Manage LEXICON and Words’ List Screen**

The Screen provides an interface for the Teacher/Parent to update the LEXICON database of words and the List for Words for Work, as well as to refresh the Temporal lists

Back Button to Go Back to STARTUP Screen

Exit Button to Exit Completely from the App if needed

List of Words for Work (these are lists that the users can pick and start working). Words from this list go with the configuration file when working on the different Activities.

Temporal Lists button (Lists of 3 words, Lists of 4 words, Lists of 5, 6, 7, and 8 words) are the lists that the System will refresh before going out from this Screen. When tapping on this button the system regroups the words from the LEXICON data base in words of 3, 4, 5, 6, 7 or 8 letters.

New Word label and next to it a Text box to type the new word

Ready sound to use (bring from outside, USB, internet, SDcard, ..)

New Sound recording of the New word sound and next to it a text button to type the name of the sound file.

Option to listen to the word sound before saving.

Select graphic button with option to take from library, from internet and to capture with camera. Next to this a text box to type the name of the graphic.

Save to save new word in written form, the sound of the word, the graphic to be used.

Different sounds formats to be allowed

Different graphic’s formats to be allowed also

**LEXICON: Structure of the database**

Database of words has 4 fields and unlimited records: keyfield, word$, soundofword$, pictofword$

keyfield word sound picture

1. boy boy.wav boy.png

2. man man.mp3 man.jpg

3. sun sun.mp4 sun.gif

1. **Reports’ Screen**

**Reports file:**

Keyfield, userid$, date$, activitynum, configurationfile$, DurationofActivity in minutes and seconds, numberofwords, numberofbuttons, numberoftaps, score, graphicsonoff, writtenwordon, wrongWord1$, wrongWord2$, wrongWord3$, wrongWord4$, wrongWord5$, wrongWord6$, wrongWord7$, wrongWord8$, wrongWord9$, wrongWord10$, wrongWord11$, wrongWord12$, wrongWord13$, wrongWord14$, wrongWord15$, wrongWord16$, wrongWord17$, wrongWord18$, wrongWord19$, wrongWord20$

Sample Record:

**101, MAKRIS, 14/05/22, 3, MAKRISCONFIG$, 3.15, 10, 6, 156, 80, YES, NO, “baby”, “ ”, “ ”, “ ”, “duck”, “kick”, “ ”, “ ”, “ ”, “late”, “back”, “ ”, “ ”, “ ”, “luck”, “sick”, “ ”, “ ”, “ ”, “mate”**

Each record will be added to the report. The number of records can be unlimited. In this way the user can make researches on most difficult words. Report to be exported as Excel file or any manageable type of document for research purposes.

List results on the screen.

Save the list in the device

Print the results

Send results by email

This screen is a screen to manage the report and the report results.

1. Send report with email
2. Export in Excel file
3. Read results
4. **App info Screen.**

This Screen basically has the information about the developers of the Software and the Intellectual property.

The Screen includes:

1. ΛΕΞΟΚΑΤΑΣΚΕΥΑΣΤΗΣ
2. Version: 1.00, Year: 2022
3. LOGO of the Company
4. Developpers: SESAT Ltd
5. Inspiration: Pantelis Makris
6. [www.icteach.org](http://www.icteach.org) [www.sesarab.com](http://www.sesarab.com)
7. Tel. 0035799663397

**A database of the Greek Alphabet**

**List of diphthongs**

1. αι, ει, οι, υι, αυ, ευ, ηυ, ου
2. sounds of diphthongs

**List of consonants**

1. β, γ, δ, ζ, θ, κ, λ, μ, ν, ξ, π, ρ, σ, τ, φ, χ, ψ, ς
2. Sounds of consonants

**List of vowels**

1. α, ε, η, ι, ο, υ, ω
2. Sounds of vowels

**Folder with sounds of words**

**Folder with sounds of letters or diphthongs**

**Databases:**

List of words (LEXICON)

SETS of words

List of diphthongs

List of consonants

List of vowels

Report file

List of Configurations

List of Positive feed backs (5 or 10 each)

Folder with pictures

List of Negative feedback (5 or ten each)

Folder with phonemes’ sounds

Folder with feedback sounds

Database of words :

**Other terms and obligations for the programmer/s:**

1. To keep with the agreed deadlines
2. To regularly update the buyers (weekly) on the progress of the project
3. To deliver the code of the App to the buyer regularly (weekly)
4. To provide Demos regularly (weekly)
5. Finalize all required procedures with upload up to the stage that users can pay and download the App
6. During the development a new version of the App will be expected every week unless otherwise agreed
7. To finally deliver the App to the buyer
8. To deliver the final code of the App to the buyer
9. Support for 6 months after the day of uploading
10. No extra costs will be approved unless agreed
11. Programmer agrees not to disclose any information about the App or the Buyer
12. Programmer agrees not to copy the App or develop the same App or similar App for another Buyer
13. To develop if required a promotion video (This will be budgeted separately)
14. To complete the process of Publishing the App on the internet, make it available to clients
15. To be available to translate and adapt the same App in Arabic, or Russian or other language/s.