

Solfy: A Tool for Promoting Music Literacy in Schools

Singing is part of music curricula in all countries and can lead to amazing benefits for emotional, cognitive, physical and social health, bringing joy to singers and audience. Learning and practicing Solfege, opens the doors to music literacy for the majority of students who do not have the privilege to receive paid private music lessons.

The platform includes technological innovations in the field of singing synthesis & analysis and machine learning, together with new music learning methods (beside others proposed in the past by Kodally, Orff or Dalcoze). Solfy is online - <https://www.4solfy.com/>, where new users can register and begin testing/practicing.

Solfy sings solfege from digital scores, listens, records and appreciates users' performance, gives feedback and keeps progress records. It will help teachers and students (as well as parents) in practicing singing from score – especially outside the class, without the need for any additional musical instrument. Learning to sing solfege is equivalent to learning a new language: in our case, the (*intimate*) language of (*western*) music.

Practicing singing, either alone or with others, may help reduce the verbal violence in day-to-day communication, and thus reduce physical violence.

We are a team of music pedagogues and digital technologists that are looking for collaborations to organize and run a *pilot/research* with the platform, in elementary, secondary and music schools from different regions and countries.

Purpose of the pilot:

1. To check the platform technologically, pedagogically and for content under real conditions – locally and remotely.
2. To learn how teachers, students (and parents) receive the platform and combine it with the existing methods of teaching.
3. To check if using the app in preparing solfege homework can benefit the education system from an additional weekly hour of individual guided study, without doubling the budget for class hours.
4. Measuring the effectiveness of the method for achieving musical literacy by comparing results at the end of the year to parallel classes that do not participate in the program.
5. Lessons learned, improvements and construction of a follow-up plan to implement the method in the formal system.

Minimum requirements:

1. Computer with sound card, laptop, electronic tablet or smartphone.
2. Chrome™, Windows™, MacOS™¹, Android™. At this time, we do not support iOS™.
3. Headset-with-microphone (gaming headset);

¹ As of now, there is full MacOS™ support but no iOS (iPhone or iPad) support. On a smartphone small screen, the recording and feedback window appear beneath the Play Solfege window.

Solfy in the classroom – or online, as in Covid-19 restrictions (called in “normal” times: singing together²)

Assuming that the average teacher allots ~ 12-14 minutes for teaching music notation, during the pilot they will devote the same amount of time to the subject. Solfy is planned to contain six levels of studies, each level having around 26-28 progressively graded³ lessons with two exercises and two short "repertoire" songs each.

The teacher presents the lesson with a laptop and projector (alternatively, writing the exercises on the board), or, as in the COVID-19 restrictions time on an online platform. Assuming that pupils have studied at home the lesson from the previous week, in the *normal times*, the teacher will ask the class to sing the solfege/s in different variants, following the notes on the projector screen (in online, this activity perhaps will be a little asynchronous due the connections latency). The activity described should last no more than ~6-7 minutes.

For the new lesson: the teacher presents it to the class (locally or remotely), explains the new element/concept/subject, sings with the class for ~6-7 minute, and asks the pupils to do the same at home: to practice singing solfeges with Solfy a few times a week ~12-14 minutes each time.

In class (in *normal times*), the focus is on singing together following the notes on projector's screen, board or papers – not from the personal devices (or singing only from memory, by ear). However, the teacher will explain how to use the app at home. While playing the solfege, it is possible to click in any place on the score in order to re-play the solfege from that respective point.

Solfy outside the classroom – at home, for individual study:

The *play (reference)* function displays the notes and sounds the solfeges; the pupil/s listens, follows, sings with the inner voice, and learns. After listening, when the pupil/s thinks are ready to perform the solfege, hits the *record* button. Then, a metronome and an instrumental melodic guide will sound in headset, giving support in rhythm and intonation. Following visually the notes from the *reference*, and listening to metronom and audio-guide, the user will concentrate on singing the solfege with the correct syllable, pitch, duration and intensity.

A few seconds after the recording is finished, the software will display the musical notes of the recorded solfege and provide feedback on the accuracy and quality of the vocals (on colored characters). Accuracies appear in green and inaccuracies in red. The pupil/s can play/sound and listen to the recording to internalize the material and to learn from mistakes. Thus they can improve their performance by making new recordings. If they make fewer than 3 mistakes (parameter controllable

² Here is a video with a K-5 class from Romania filmed less than 3 months after the beginnign of the pilot with Solfy. The school director - that from the beginning have supported the idea of practicing solfege in school and at home - was present in the classroom, filming, and looking happy with the results - <https://www.youtube.com/watch?v=PAy0nLNMWJI&t=18s>.

³ In general, each new lesson adds a new concept, or maximum two simple concepts/notions.

at this time by the developers), Solfy will play the user's recorded solfege, together with a suitable accompaniment – as a musical reward, bringing satisfaction and joy to the user.

While playing the solfege, it is possible to click in any place on the score in order to re-play the solfege from that respective point.

Registration and use of Solfy - <https://www.4solfy.com/>

After registration, will appear the Welcome to Solfy window, with a toolbar containing several options:

Explore Solfy – allows scrolling between lessons, listening to solfege, recording oneself sing solfege without feedback from the app. Once you pick this option, you'll get the ability to choose exercises from a list of exercises and difficulty levels.

Practice solfege – allows you to receive feedback after performing and recording the solfege, given that you use a headset, are in a quiet environment, and perform the lessons in ascending order, one after the other.

Review your work – allows every user to scroll between their recorded solfege performances, and re-check, study, and compare between them to follow up on their progress.

Recording Test – a test of recording with the microphone.

Adapt Solfy to your voice – for advanced users, that know to read the notes and do not need to begin with Level 1. They will record only three exercises in order to avoid restrictions.

Teacher view – allows teachers to review, monitor and follow up on pupils work practicing with Solfy, in order to keep up with the students' progress and to offer help when necessary.

In the main window:

Play Solfege window, or reference. Pick an exercise or a tune to practice based on the teacher's recommendation, and press play. Follow the notes on the screen and listen to the solfege several times through a speaker or headset. Once you feel ready, and are in a quiet environment, press the record button, listen to the metronome and the guiding sounds through the headset, and sing the solfege into the microphone. Several seconds after you're done recording, the feedback will appear in the recording window. The Record button have a few options for recording: with MIDI+beats (instrumental guide + metronome); with Beats (only metronome); with Orchestra (after winning the option); with Mute (without any audio support from Solfy – only visual support).

Recording and feedback window. If the feedback is entirely green, then the user's singing was entirely correct. Errors will appear in red. There may be errors in the name of the note, timbre, length, and volume of the sung notes. You can listen to the exercise repeatedly, until performance improves, while following the marker.

After correctly performing the exercise, the app will play the user's performance along with a musical accompaniment, as a "reward" for the successful performance.

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