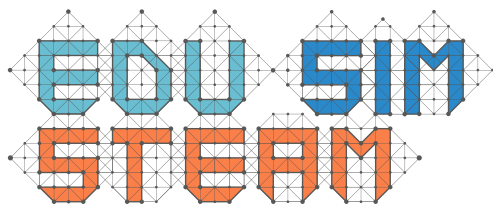**DIRECTORATE GENERAL FOR
INNOVATION AND EDUCATIONAL
TECHNOLOGIES**

# SimuLearn
# Pilot Study
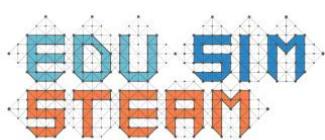
## 2023

EDUSIMSTEAM | Erasmus+ KA3 Forward Looking Cooperation Project

With the support of the
Erasmus+ Programme
of the European Union

**EDUSIMSTEAM SimuLearn Pilot Implementation Evaluation Report**
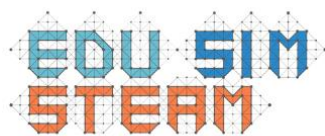
This report was prepared to present the results obtained from the pilot process conducted for SimuLearn. SimuLearn- innovative online platform developed by the project partner ACROME to implement STEAM learning scenarios in an online simulation environment. The pilot implementation carried out participation of teachers, mentors and students in Türkiye and Spain between March-June, 2023.

EDUSIMSTEAM project is a forward-looking project aimed at fostering and advancing STEAM (Science, Technology, Engineering, Arts, and Mathematics) education within educational institutions in Europe especially in schools. EDUSIMSTEAM project is conducted in collaboration with 10 European partners by the Ministry of National Education, General Directorate of Innovation and Educational Technologies. In the scope of EDUSIMSTEAM project activities, SimuLearn platform was launched to meet the needs of current generations to cope with technological advancements. Engaging teachers and students with simulation-based STEAM practices, the project looking forward to achieve substantial progress in STEAM education throughout Europe. In this respect, SimuLearn provided participants to experience solving daily life problems, experiential learning and to integrate their creativity, algorithmic thinking, coding skills through eight STEAM scenarios within two themes. These two themes namely "Smart City" and "Mars" each of these themes consisted of four interrelated and integrated STEAM scenarios. The pilot process of SimuLearn implemented with the guidance of EDUSIMSTEAM mentors and the participation of teachers and students from Türkiye and Spain. In the pilot process, participants asked to evaluate SimuLearn platform through survey including user experience, contents of the platform, students experience in the platform, scenario instructions and suggestions for improvements.
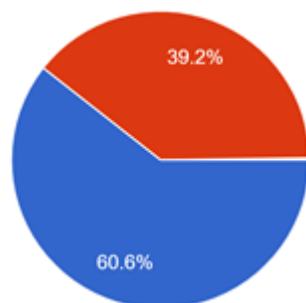
The next sections of the report documented the results gathered from the evaluation survey. The results of the participants from Türkiye and Spain will be reported in the related sections.

1. **SimuLearn Platform Evaluation Results for User Experience:**

In relation to the user experience of the SimuLearn platform, most of the participating teachers stated that the platform was easily used, but there were some reported problems related to access to the platform. The results regarding user experience provided by the teachers in Türkiye in the pilot process related to the SimuLearn platform are as follows;

- 60.6 % did not experience problems
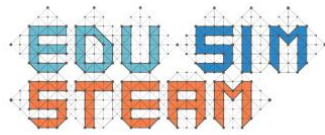- 39.2 % experience problems

In general, participants from Türkiye were reported with the following problems regarding the SimuLearn;

- 109 participants (58.9%) have difficulty in using the system
- 70 participants (37.8%) had difficulty in tracking the instructions in the scenario
- 55 participants (29.7%) connection problem
- 53 participants (28.6%) had difficulty in entering the system
- 39 participants (21.1%) stated that the editor opened late



participants experienced problems regarding SimuLearn
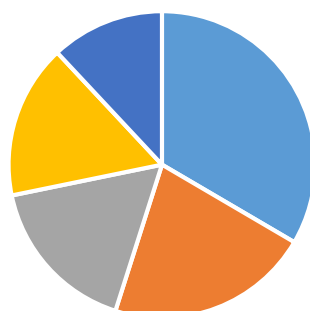
- have difficulty in using the system
- had difficulty in tracking the instructions in the scenario
- connection problem
- had difficulty in entering the system
- stated that the editor opened late

Participants from Spain were also reported they experienced problems regarding the SimuLearn. In fact, there were seen few participants (18%) reported their problems regarding SimuLearn. The percentages of the evaluation survey were presented below;
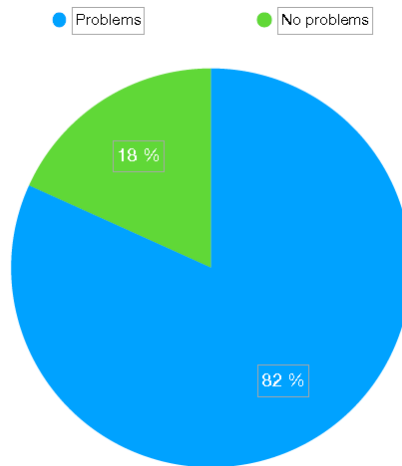


The problems participants experienced also gathered. The common problems denoted in the survey regarding SimuLearn was highly similar to the Turkish participants:
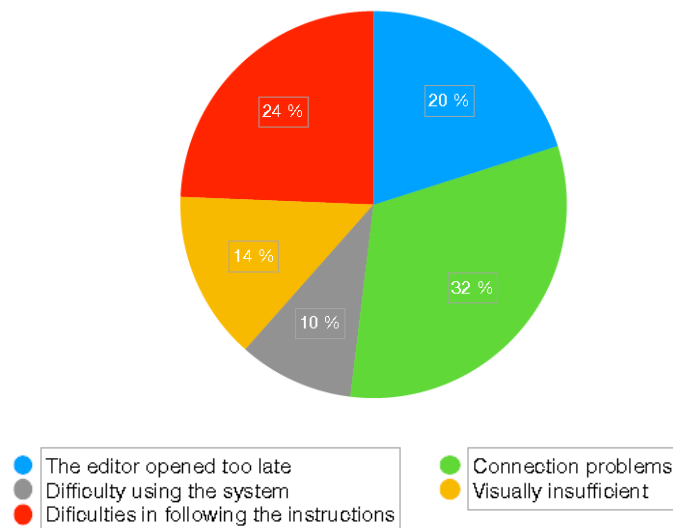


To sum up, less participants from Türkiye and Spain indicated problems about SimuLearn. The corresponding problems reported from both countries participants were mostly related to connection to the platform, editor's late openning and following instructions of the scenarios.
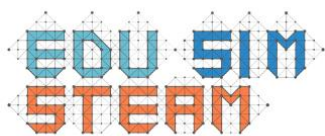
**2. Evaluation results for the contents in SimuLearn Platform:**

Participants expressed their feedbacks regarding the content of the SimuLearn platform. They found the content on the SimuLearn platform in line with the level of the students and attracted their attention. However, it was stated from Turkish participants that the platform would be more effective by making the content language in Turkish and take students' attention when the content amplified with visually attractive content more. In coding content, it has been reported that the computers of the classes and the lack of coding pre -information of small levels such as kindergarten and primary school may result the difficulty. The evaluation results of the teachers participating in the pilot process in Türkiye regarding the content on the SimuLearn platform are as follows;

- 66.9 % attracted the attention of the platform's students
- 51.3 % can be used as a supportive tool in their classes
- 51.3 % in accordance with the levels of their students
- 36.7 % content should be enriched
- 30.9 %, need to be visually enriching the platform
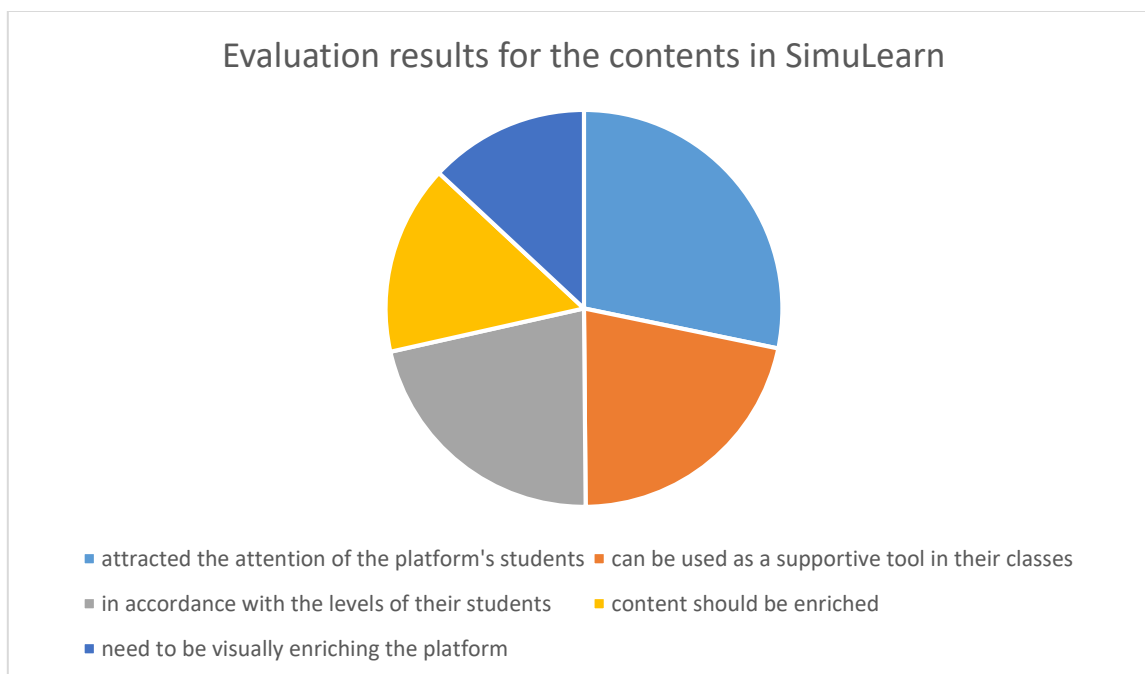


The progression recommendations of the participants from Türkiye related to the content on the SimuLearn platform were as follows;
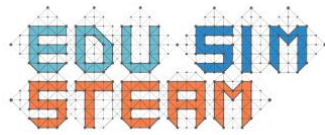
- Language integrity should be ensured, especially the content of the coding section should be updated in Turkish.
- Instructions and definitions should be simple and understandable especially for the kindergarten students.

• Content should be included on the platform in accordance with all ages and levels. In particular, there should be instructions and information about block -based coding. The associated suggestions in the evaluation form are as follows:

- An area that can practice coding and obtains more comprehensive information should be added.
- Although there are instructions in the scenarios, the lack of adequate enlargement of the windows opened is necessary to make the necessary improvements by stating that the coding sections are not clearly visible.

• Content should be made more interactive, interesting. Sound effects and warnings, feedback should be presented. The associated suggestions in the evaluation form are as follows:

- The competition feature should be added to the platform. Students should be able to compete in groups with time and sound effects. At the end of the period, the scores/rankings of the groups should appear on the screen. For example, content can be added with at least the lamp or at least energy, such as the group that enables the best lighting gets the highest score. Thus, at the end of each course, students can both receive feedback and have fun with fun.
- Time, points/ranking should be added in order to attract students' interest more and learn with fun in cooperation. Students should be offered the opportunity to work on the scenarios. Symbolic prizes (badges, points, etc.) should be given to groups that make up the most efficient and at least cost lighting system.

• The feedback system for progress on the platform should be developed. The associated suggestions in the evaluation form are as follows:

- It was stated that the progress of the studies carried out in the process in simulation is not understood and warnings did not include for follow -up.
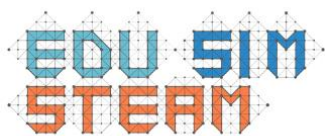
• For the waiting moment of the uploaded content and at the end of the episode, the waiting time can be made effective with attractive content. The associated suggestions in the evaluation form are as follows:

- In the input section, in some sections where the program is expected to be opened, loading is shown by moving animation. It has been reported that the lack of a movement other than the "Waiting" writing on the screen where the DGIET and Riders logo is located caused the formation of freezing on the screen and the end of the system by ending the study.

Recommendations for visual development of content were as follows:

• Visual content should be enriched and made more attractive and interesting. The associated suggestions in the evaluation form are as follows:

- Visually different ways should be developed by adding various streets. Working with different street examples will be beneficial in terms of discovering the differences, indicating that they will discover different central placement options.
- The formulas containing science should be visualized to make it more understandable.

• The quality of the visual content should be improved. The associated suggestions in the evaluation form are as follows:

- Larger pictures of pixels should be used.
- Content should be closer to three -dimensional visuals in terms of color and design.
- The color of the poles used and the shape of the sensors should be developed in the symbols by reporting that the primary school child is challenging and distinguishing with the background of the program.
- It should be made interesting using more vivid colors.

• It has been reported that the students' interest will be increased by adding an avatar and icon to the simulation environment.

Similar to Turkish participants, there were provided suggestions from Spanish participants as well. In fact, the participants found the platform content suitable to students level. However, they recommended about the SimuLearn that it needs to be supported with more visual content and the content of the platform needed to be revised.
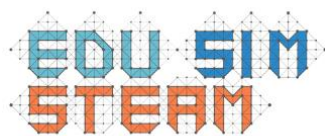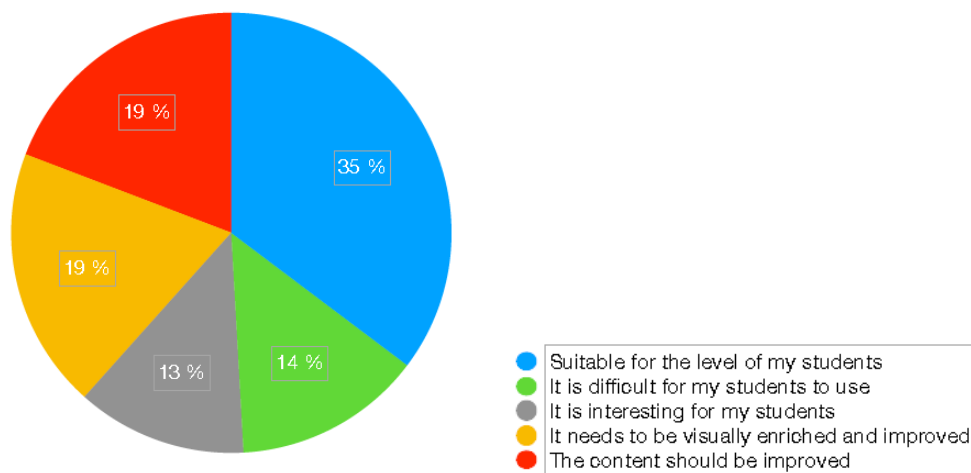
As seen from the figure, although the participants found the content appropriate to the students' level, they also indicated that the content of the simuLearn needs to be improved, enriched and enhanced visually.

**3. Evaluation results for the use of SimuLearn platform by students:**

The results of the evaluation of the SimuLearn platform revealed that the platform provides students with the opportunity to solve real world problem and supports the gaining skills such as cooperation, communication and creativity. Both Turkish and Spanish participants shared these common results and the percentage of the findings presented below separately.

In general, the findings of the participants in Türkiye regarding students' use of the platform were as follows;

• 76.3 % of the platform contains real world problems
• 72.9 % support students to design their own
• 50.0 % gave students the opportunity to communicate throughout the design process
• 49.8 % gave students the opportunity to work as a group during the event
• 43.4 % stated that it is easy and understandable for the use of students
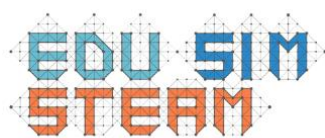
the use of simuLearn by students
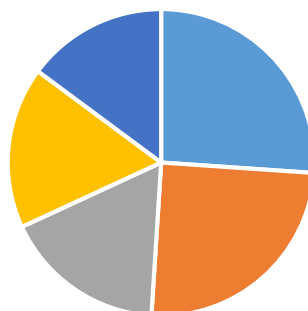
- platform contains real world problems
- support students to design their own
- gave students the opportunity to communicate throughout the design process
- gave students the opportunity to work as a group during the event
- it is easy and understandable for the use of students

Consistent with the findings gathered from Turkish participants, in Spain, participants highlighted the strengths of simuLearn in supporting student to solve real problems in their own pace and own perspective. Moreover, the platform found to encourage students' collaboration and upgrade their skills to solve daily life problems. The related percentages presented below indicated the overall collected data:
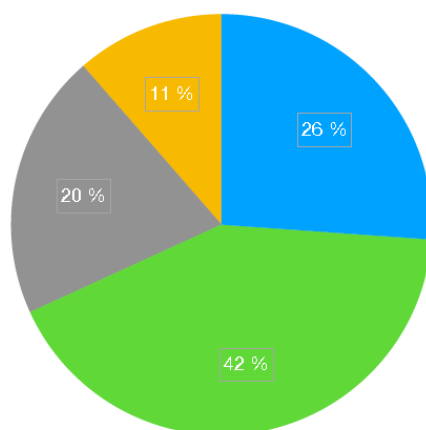


- It includes real world problems
- It supports students to design on their own
- It offers students the opportunity to work in groups throughout the activity
- It provides an opportunity for students to communicate throughout the design process.
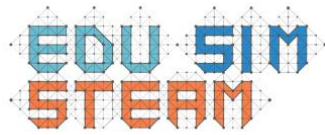
**4. Evaluation results regarding scenario instructions:**

Regarding scenario instructions, there were found contradiction between the results of the participants from Türkiye and Spain. In fact, Turkish participants found the instruction of the platform implemented by students in a high percentage. This result indicating the instructions in the platform was clear and understandable enough by the students.

- 64.4 % of the participants believed that students can implement the scenarios with the instructions in the platform
- 35.4 % of the participants believe that these scenarios need to be developed for implementation.
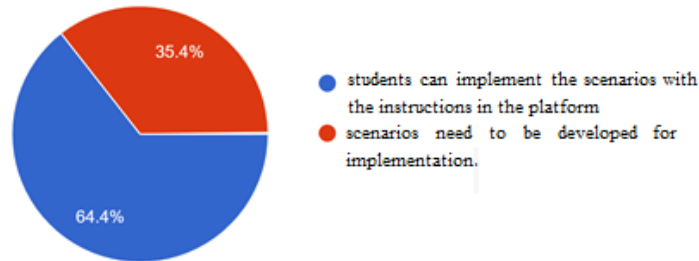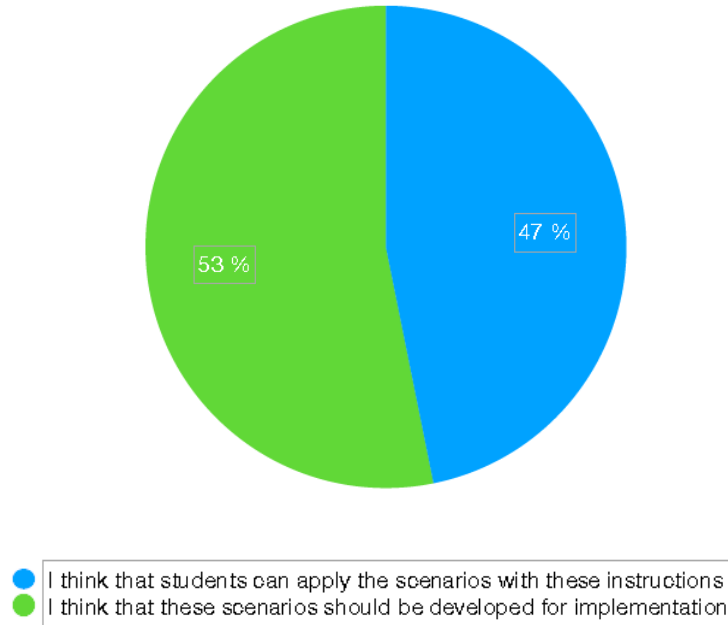


The suggestions of the participants in Türkiye also provided their development recommendations for the SimuLearn platform scenario instructions that are listed as follows;

- Tasks should be clearly listed and stated.
- Guidance statements should be informative enough, short, understandable and clear for all levels of the students.
- It should be more understandable and easy to follow with audible warning and guidance.
- It should be made clear by applying different coloring for completed and unfinished tasks.
- At the end of the application, feedback should be presented, suggestions for development should be added, and progress should be reported.
- There is need to include warnings and clues when the robot design may not achieved in Mars scenarios.

Although Turkish participants found instruction sof the simuLearn platform suitable for students, from their suggestions it seemed to further needs some further improvements in the instructions to be more effective. In fact, in Spain, participants also stated that instructions
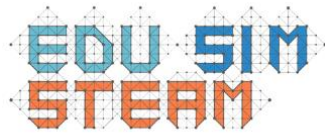
in the platform should be improved in a way to be more clarified, simplified and clearly stated for students. The survey results was documented with their percentages below.



47 %

53 %

- I think that students can apply the scenarios with these instructions
- I think that these scenarios should be developed for implementation

**5. Conclusions on the elements required to be improved:**

The points stated by the participating teachers who shared their suggestions for improvement in order to make the platform more effective and efficient in the implementation of EDUSIMSTEAM scenarios on the SimuLearn platform, based on their experience in the pilot process. These suggestions from Turkish participants are listed below.

- The platform should be enriched with more and different environment options where different applications can be experienced by adding more street examples.
- Considering the existing technical infrastructure inadequacies of the schools, it should be ensured that the platform can be used with different tools such as phones and tablets.
- Due to the system's high demand for stable internet and hardware, resolving schools' internet access issues will further enhance the efficiency of the application. When the use of smart boards is facilitated to a level that allows their integration, it will be a great application.
- Instruction videos should not be too small, they should be enlarged when clicked. The videos should be short and understandable, and the instructions should be clear.
- The platform should be designed in a way that visually attracts the attention of children.
- An archive with supporting materials or links should be included.
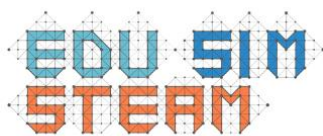
In the pilot process of Spain both teachers and students provided development feedback for the platform resulted from their pilot experience. Therefore the following documentation initially presented the feedbacks gathered from students, next the teachers respectively.
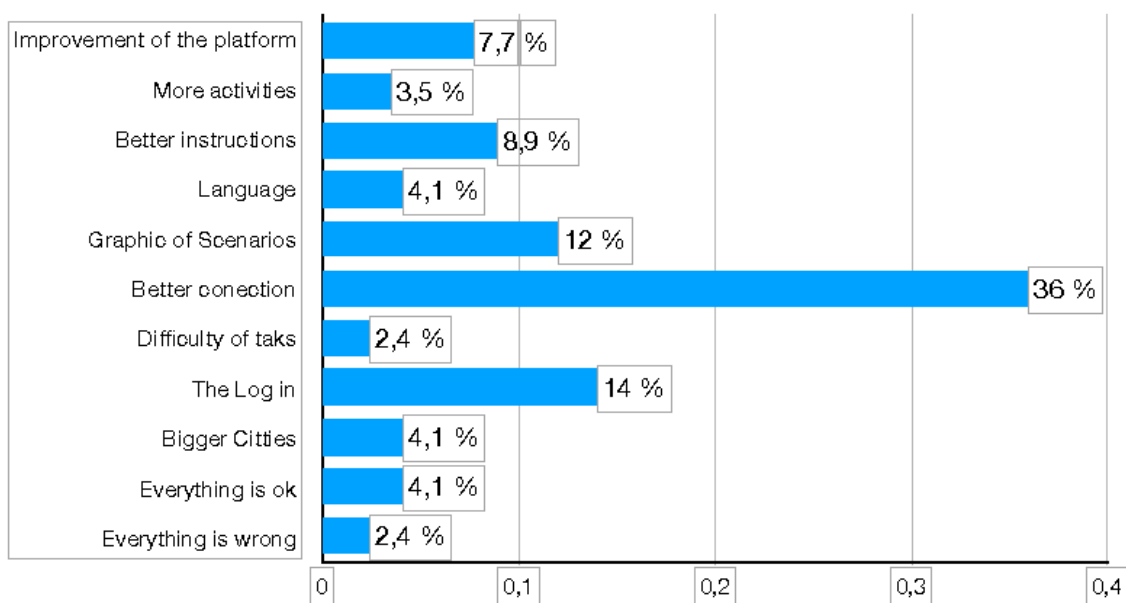


Students appeared to provide suggestions for platform development commonly in the aspects of connection, login and the graphics of scenarios. Similar to Spanish students, teachers highlighted SimuLearn platform need improvement in connection, saving previous work and connection. The findings gathered through evaluation survey presented below with the corresponding percentages.
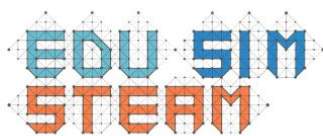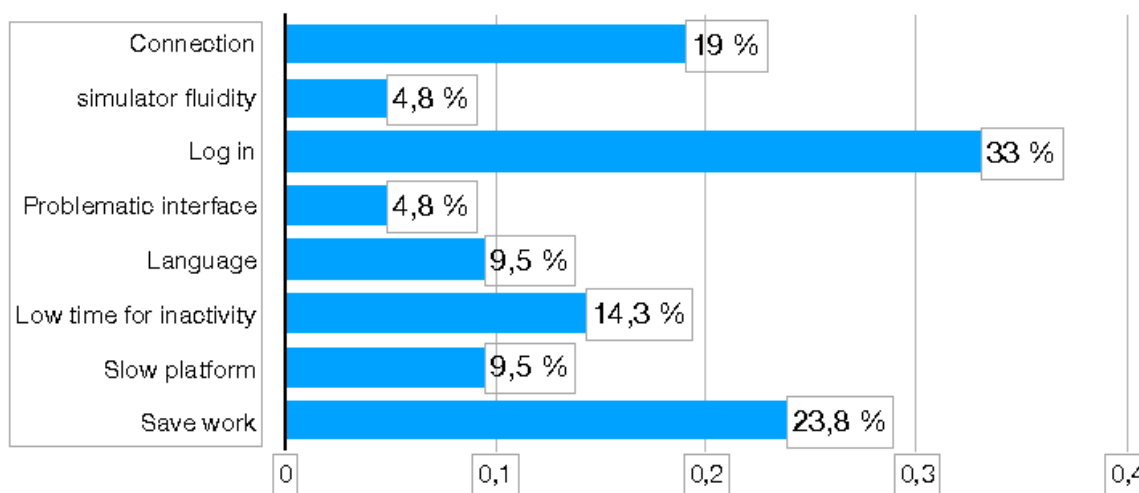
The platform would be to allow teachers to create classes and provide students with a code to join these classes without the need for registration. This approach would greatly enhance flexibility, alleviate registration issues, and eliminate the necessity of having an email address.

It emphasizes the importance of enabling students to save their work. Although you have mentioned that this functionality is available, our tests have indicated that, particularly in the Mars scenario, the work is frequently not saved, requiring students to begin again from the beginning. This situation proves to be frustrating for them.

The matter of connectivity also arises, which has been consistently discussed throughout the report. The stability of the connection differs between the two scenarios. Our observations confirm that the "Smart City" scenario exhibits greater stability compared to the "Mars" scenario. The reason for this disparity could be attributed to the latter scenario's higher resource consumption, potentially leading to more frequent crashes. However, this is an area that requires improvement.

To address this concern, it is essential to extend the duration of the platform's inactivity timeout. Currently, the platform expels students if they remain inactive for less than 10 minutes. Consequently, students lose all their work and are forced to begin anew. Increasing the waiting time would prevent such instances and allow students to retain their progress.