

COLDEX



Collaborative Learning and Distributed Experimentation

Information Society Technologies Programme

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BeLife: Tutorial

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1 General Interaction

This chapter describes the interaction that any user, regardless of its profile, can have with the system.

1.1 BeLife screens

In BeLife, all the user interface screens follow a common design which features the following areas:

- The screen title (top left corner of the screen);
- Help button (top right corner of the screen);
- BeLife logo (bottom left corner of the screen);
- Status messages (bottom centre of the screen); and
- Current user information (only after log in, top right corner of the screen).

1.2 User Registration

Before a user can interact with BeLife, he must be registered in the server. User Registration is performed in the *welcome screen* by pressing the *register* button (see Figure 1.1).

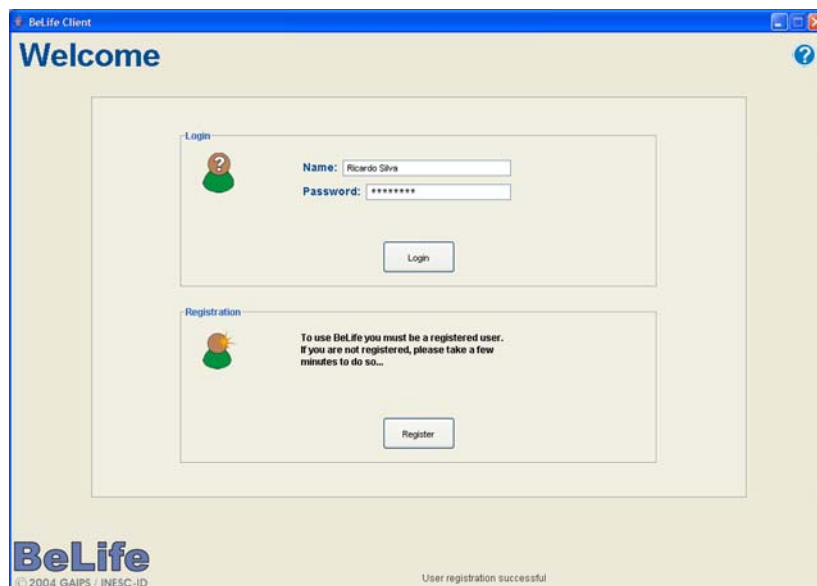


Figure 1.1 – Welcome screen

The *registration screen* is displayed when the button is pressed, allowing the user to introduce his personal information, namely (see Figure 1.2):

- Username;

- Password;
- E-mail;
- School; and
- Country.

Then the user must select his profile from the following:

- Teacher;
- Student; and
- Observer.

Figure 1.2 – Registration screen

The *teacher* is the user that creates and manages simulations and greenhouse, and manages user groups. Teachers are also able to edit the groups' tasks and goals.

The *student* is the main actor in the system. He can join or leave a user group, edit the group's tasks and goals, change the greenhouse's parameters and retrieve the simulation's results.

The *observer* is the most limited user since he is only allowed to inspect the current state of his group's greenhouse and respective plants.

1.3 Log In

After registering, a user can log in to the system using the *welcome screen* (see Figure 1.1). To log in, the user must write his username and password in the appropriate text boxes and press the *login* button.

If an unregistered user tries to log in to the system, an error message will be displayed in the status messages area of the screen stating that the server has no record of such user. Also, if the user inserts a wrong password the system will display an error message.

Depending on the user's profile, a different screen will be displayed after the log in procedure allowing the user to perform different actions.

1.4 Log Out

After a user logs in, a *user info* panel appears in the top right corner of the screen, showing the current user name and profile and allowing such user to log out by pressing the *log out* button (see Figure 1.3).

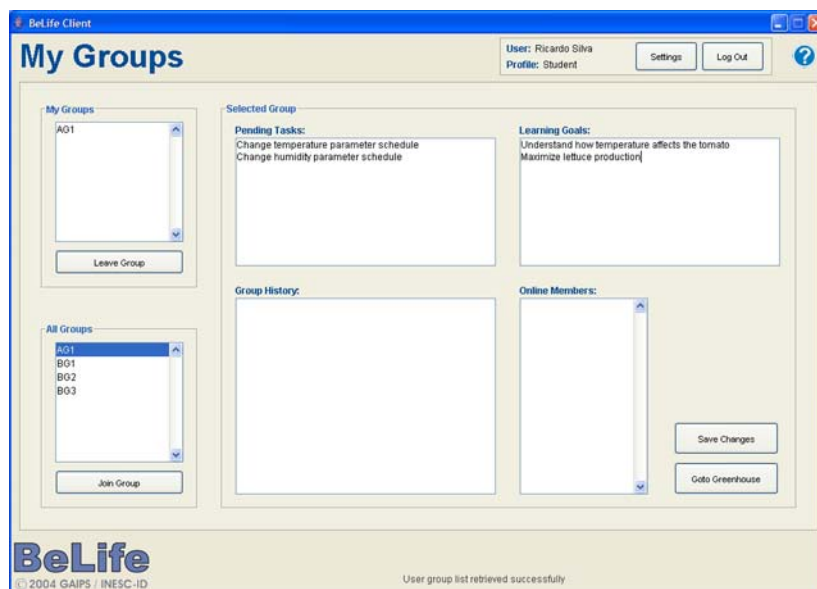


Figure 1.3 – My Groups screen (student user view)

There is also a *settings* button in the referred panel that allows a user to change his user settings. Currently, this feature is not enabled.

2 Teacher Actions

Teachers are the users that plan the experiments and manage the user groups. This chapter describes the actions that such users can perform in the system.

2.1 Simulation Management

After logging in, a teacher user will be shown the *simulations screen* (see Figure 2.1). In BeLife, the world is made of simulation spaces, and each simulation space can have several user groups.

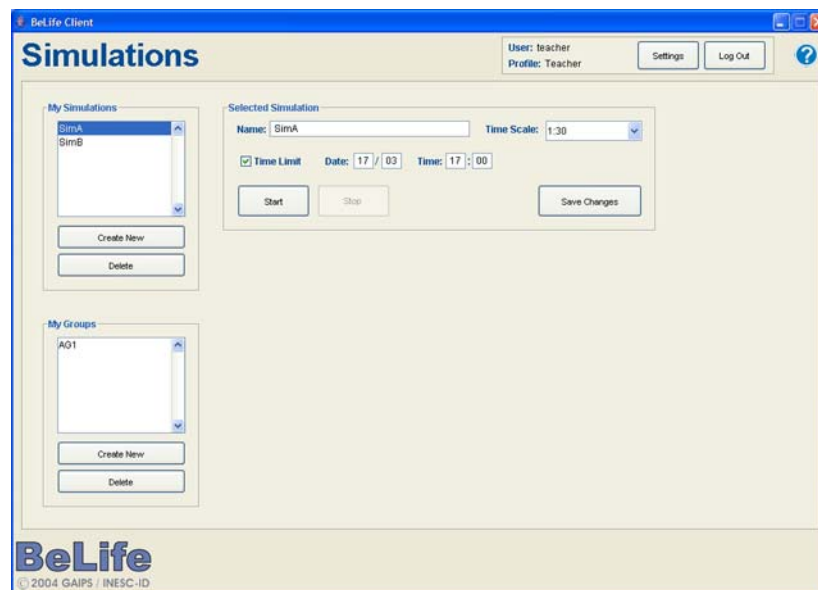


Figure 2.1 – Simulation screen (teacher view)

In the left side of the screen, the *my simulations* list show the simulation spaces created by the current teacher user. When a simulation space is selected, the *my groups* list show the groups that belong to that simulation space.

2.1.1 Creating Simulations

A teacher can create a simulation space by pressing the *create new* button in the *my simulations* panel (see Figure 2.1). A new panel appears on the centre of the screen (*selected simulation* panel) where the teacher must write the simulation space name and select the simulation time scale.

After pressing the *save changes* button, a new simulation space is created and its name appears in the *my simulations* list (left side of the screen).

2.1.2 Changing Simulation Properties

To change a simulation space's properties, a teacher must select the desired simulation space in the *my simulations* list (see Figure 2.1). The *selected simulation* panel will be displayed in the centre of the screen allowing the user to change the simulation's time scale and set a time limit to the simulation. A simulation will automatically stop when its time limit is reached.

After changing the simulation space properties, the user must press the *save changes* button to send the information to the server.

In case something wrong happens, an error message will be displayed in the status messages area of the screen.

2.1.3 Deleting Simulations

Simulations can be deleted by selecting a *simulation space* from the *my simulations* list and pressing the *delete* button beneath it (see Figure 2.1). If the selected simulation space has user groups, the system won't allow its deletion.

2.1.4 Starting a Simulation

To start a simulation, the teacher must select it from the *my simulations list* and press the *start* button. The *start* button will become disabled when the simulation is running.

2.1.5 Stop a Simulation

Following the same procedure, a teacher can stop a simulation by selecting it from the *my simulations* list and pressing the *stop* button. The button is only available if the simulation is running and will be disabled if the simulation is stopped.

2.2 User Group Management

When a simulation space is selected, the *my groups* list displays the user groups that were created inside the selected simulation. Selecting a user group shows the *selected group* panel (see Figure 2.2). Each user group is associated to a greenhouse.

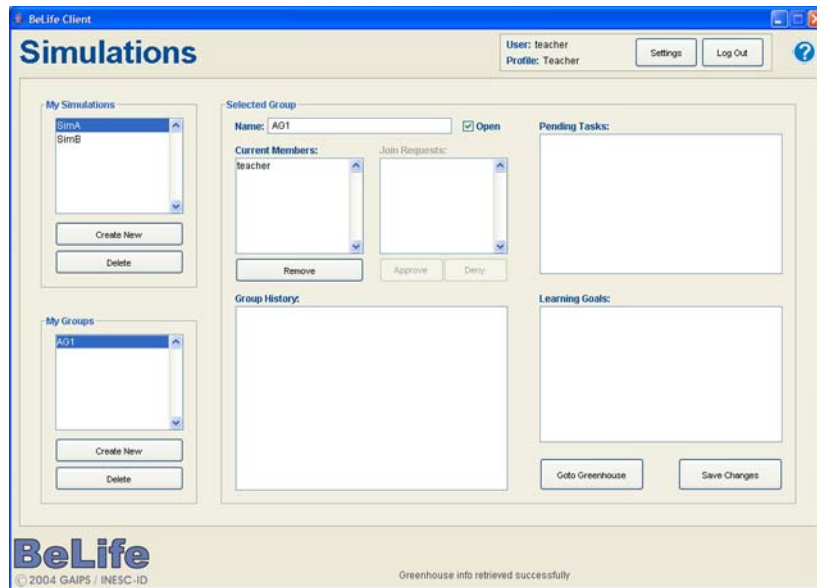


Figure 2.2 – Group screen (teacher view)

2.2.1 Creating User Groups

Teachers can create user groups by selecting a simulation space from the *my simulations* list, and pressing the *create new* button below the *my groups* list. An empty *selected group* panel appears in the centre of the screen (see Figure 2.2) allowing the user to write the group name and press the *save changes* button (bottom right corner of the panel). The new user group appears in the *my groups* list in the right side of the screen.

2.2.2 Changing User Group Properties

Selecting a user group from the *my groups* list causes the system to display the *selected group* panel in the centre of the screen (see Figure 2.2). In this panel, the teacher can set the group's tasks and goals.

Also, the teacher can set the user group as open or closed. An open user group allows any student user to join as a member. On the other hand, if a student user tries to join a closed group, a membership request is sent to the teacher and will appear in the *join requests* list. The teacher user must press the *approve* or *deny* button to allow or forbid the user to become a member of the group.

Additionally, the teacher can see the current group members in the *current members* list and, if needed, remove a member by selecting it from the list and pressing the *remove* button below the list. The system does not allow the teacher to remove himself from a group he created.

The *selected group* panel has a *group history* box in its centre, where the last actions performed by the group members are shown.

2.2.3 Deleting User Groups

The teacher can choose to delete a user group from a simulation space, by selecting a group from the *my groups* list and pressing the *delete* button below it. The user group name will disappear from the list.

3 Student Actions

Students are the main focus of the system. This chapter describes the actions that the student users can perform in BeLife.

3.1 User Group Interaction

After a student user performs the log in, the *my groups screen* is displayed (see Figure 1.3) featuring a list of the user groups of which the user is a member, and a second list of all the user groups in the server.

3.1.1 Joining a User Group

A student can join a group by selecting it from the *all groups* list and pressing the *join group* button in the *my groups screen* (see Figure 1.3). If the student is already a member of the selected group, the system will display a warning message in the status messages area.

If the group is not open, the joining action will not cause the user to immediately become a member of the group. Instead, a membership request will be created in the user group and will be waiting the teacher's approval or denial.

3.1.2 Leaving a User Group

In case a student wishes to leave a user group, he can do so by selecting the group from the *my groups* list and pressing the *leave group* button, in the *my groups screen* (see Figure 1.3).

3.1.3 Changing Group Properties

When a student user selects a group from the *my groups* list in the *my groups screen* (see Figure 1.3), the system displays the user group information in the centre of the screen.

In this screen the student can read and change the group's tasks and goals. It is also possible to see the last actions performed by group members in the *group history* list, and the members that are currently connected to the system, in the *online members* list (this feature is not available in the current version).

When a student user changes the group's tasks or goals, he must press the *save changes* button (in the bottom left corner of the screen) to send the information to the server.

3.2 Greenhouse Interaction

Each user group has an associated greenhouse, with which the members of the group will perform the experiments.

3.2.1 Entering the Greenhouse

To interact with the greenhouse, the members of the user group must enter first. To do so, the student presses the *enter greenhouse* button in the *my groups screen* (see Figure 1.3). The *greenhouse main screen* (see Figure 3.1) will be displayed.

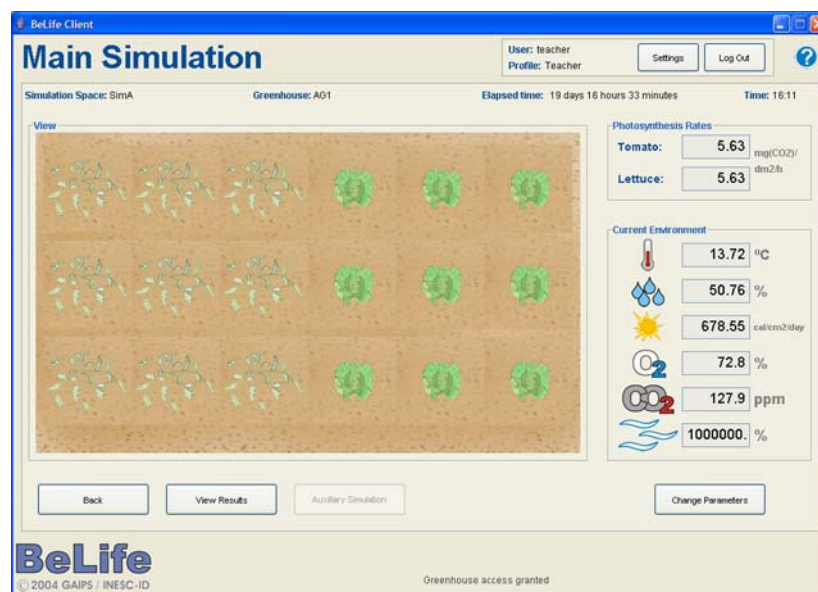


Figure 3.1 – Greenhouse main screen

This screen has five sections:

- The *greenhouse identification area*, which features the simulation space where the greenhouse was created, the greenhouse name, the elapsed time since the beginning of the simulation and the current simulated time of the day;
- The *greenhouse main view*, which shows a graphical representation of each plant in the greenhouse;
- The *photosynthesis rates* panel, that displays the current average photosynthetic rate for each of the two plant species;
- The *current environment* panel shows the current value for each of the six environment parameters of the greenhouse; and
- The *greenhouse interaction area* that has the *back* button, to return to the button, to return to the *my groups screen*, the *view results* button, to

retrieve the simulation results, and the *change parameters* button, to change the parameter schedules.

3.2.2 Inspecting a Plant

The user can inspect each of the greenhouse plants by clicking on its graphical representation in the *greenhouse main screen* (see Figure 3.1). The *plant inspection screen* (see Figure 3.2) is composed of the following areas:

- Plant identification, which features the plant species and its ID number;
- The *plant detailed view* shows a more detailed graphical representation of the selected plant;
- The *development information* panel, which features the current development phase name, phase progress and phase success rate;
- The *internal properties* panel, which shows the plant's current energy level, health percentage and leaf area; and
- The *biological processes* panel, which presents the current photosynthesis rate, respiration rate, transpiration rate and stomata opening state.



Figure 3.2 – Plant inspection screen

3.2.3 Changing Parameter Schedules

The users interact with the greenhouse by changing the environment parameters through schedules. A parameter schedule is a set of daily periods in which the greenhouse will assume a particular value for that parameter. To see the

greenhouse environment schedules, the user must press the *change parameters* button in the *greenhouse main screen* (see Figure 3.1).

In the *greenhouse environment schedules screen* (see Figure 3.3), the user can check the existing schedules for each of the six environment parameters. Each parameter schedule is shown in two different forms:

- Textual view, in the left side, which is composed of the current value for the parameter, the selected schedule item, the time period for the selected schedule item, and the parameter value for the selected schedule item;
- Graphical view, in the right side, which is a circle that represents a 24-hour day where the schedule items are displayed as coloured sections.

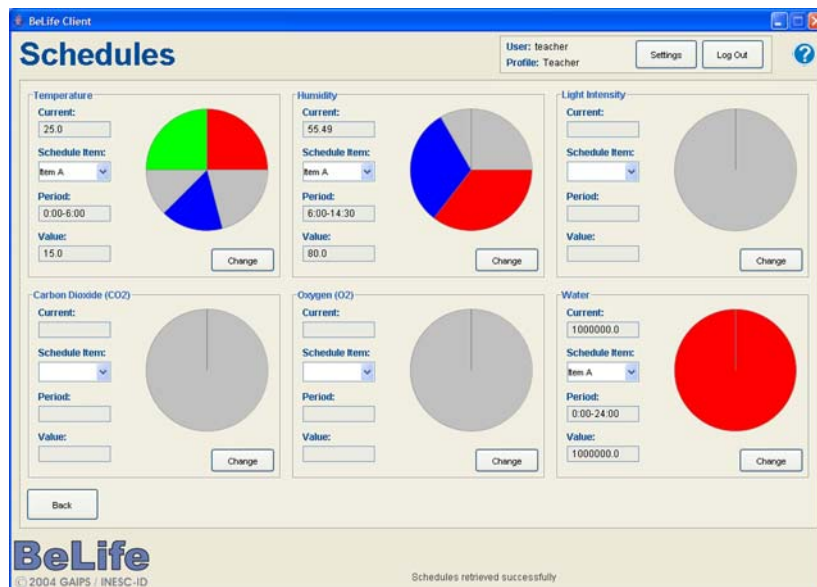


Figure 3.3 – Greenhouse environment schedules screen

To change a parameter schedule, the user presses the *change* button for the desired environment parameter, which leads to the *specific parameter schedule screen* (see Figure 3.4). In this screen, the user can change the start time, end time, and parameter value for each of the four possible parameter schedule items.

As these values are changed, the graphical representation will show the schedule items as coloured sections. To set the parameter schedule, the user must enter a reason for the change and press the *save* button.

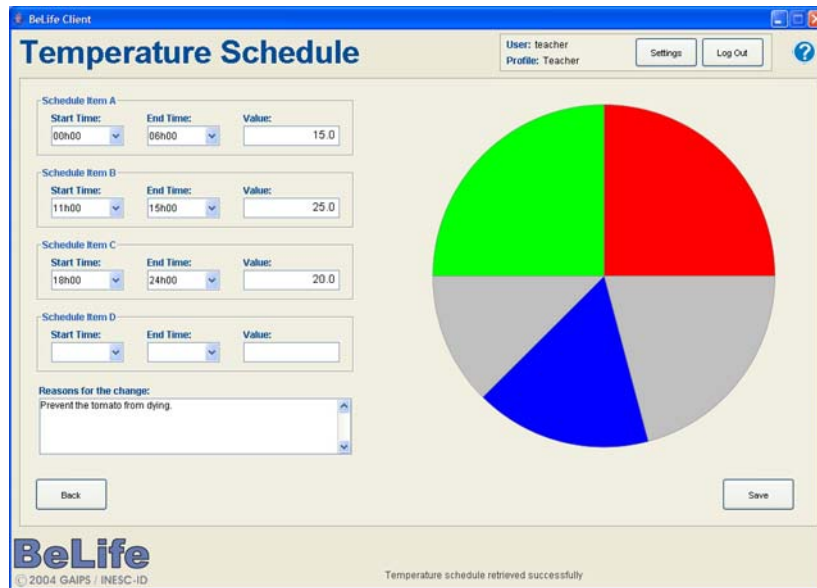


Figure 3.4 – Specific parameter schedule screen

3.2.4 Retrieving Simulation Results

At any moment, the users can retrieve simulation results by accessing the *simulation results screen* (see Figure 3.5) through the *view results* button in the *greenhouse main screen* (see Figure 3.1).

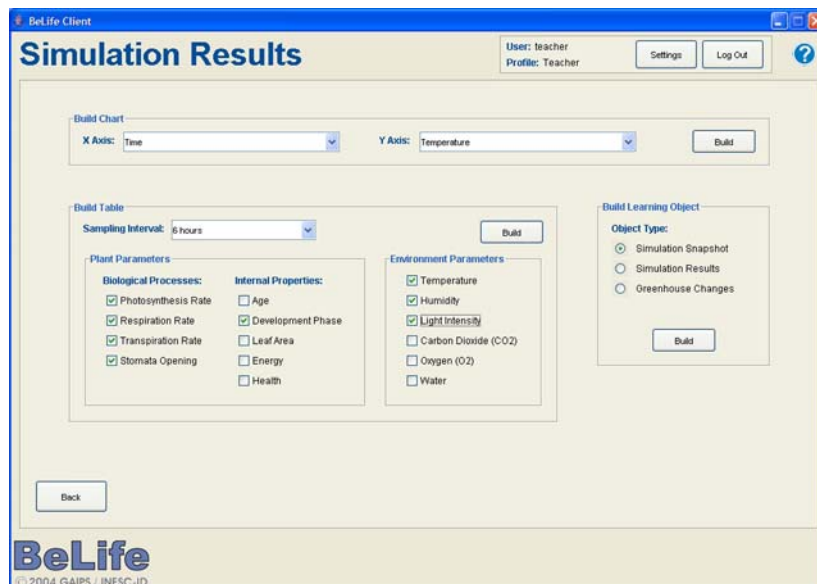


Figure 3.5 – Simulation results screen

In this screen the user can request three types of simulation outputs:

- Charts;
- Tables; and

- Learning Objects.

To build a chart, the user must select which parameter should be used for the x and y axis and press the *build* button.

To build a table, the user must select the sampling interval and the plant and environment parameters that should be taken into consideration. Each row of the table will contain the values for the selected parameters in a specific moment in time. The sampling interval is the time difference between a row and next.

Learning Objects are special outputs, in XML format, that can be exported to a Learning Object Repository. There are three types of Learning Objects:

- Simulation Snapshot – information that characterises the simulation in a specific moment in time;
- Simulation Results – all the information produced during the simulation that will allow the system to build charts and tables about that simulation on future occasions; and
- Greenhouse Changes – group members' action history in XML format.