

*Fostering Growth in the Blue Economy by developing  
an action plan for innovative European aquaculture  
VET and harmonized qualifications*

## D7.2 BlueEDU Quality Assurance during engagement and demonstration activities

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### WP 7 Quality Assurance

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## Summary

The EVAL system aims to provide the teachers and the students with a set of services that enable them to:

- Provide instant evaluation in industry oriented short, intense 2-3 days VET professionals courses,
- Extend learning outcome evaluation models by using modern, easy to use, cheap mobile response technology, to include assessment for learning in competence based systems.
- The underlying technology for the services is based in part on the ONE2ACT PeLe technology.

The system was developed using an iterative prototyping process. The design process have included the main system stakeholders: teachers and VET students. The very context of use dictates that a special emphasis must be placed on the human computer interaction aspects. The educational activity must be supported in a transparent and usable way.

### What is EVAL?

Eval is a voting system for many questions that turns students' own computers and handheld devices such as smartphones or tablets into immediate response tools. The students answer evaluation questionnaires set by the teacher, who gets an immediate overview of the students' opinion of the topic covered. The results are immediately displayed on a screen or board. This and can be used as a springboard for letting students immediately get an ownership to the course, since each students active contribution may immediately affect the learning methods. Eval helps the teacher to solve misunderstandings and focus their resources towards removing misconceptions experienced during the training session. Interact with all the students, including those who are usually too modest or non-responsive to speak up.

### Why use EVAL in vocational education and training?

- Do you have students who do not participate in class?
- Do the students really understand the goal with your course?
- How do you give feedback to students that solve misunderstandings and remove misconceptions?

### Advantages

- A flexible tool for the teacher
- Student commitment
- Immediate response
- Works via WiFi
- Is compatible with modern mobile devices
- No logistics
- Enables the teacher to ask spontaneous evaluation questions
- Activates the modest students
- Easy installation
- Low cost in use
- Can be used in courses, presentations, workshops, and seminars

## How is EVAL working ?

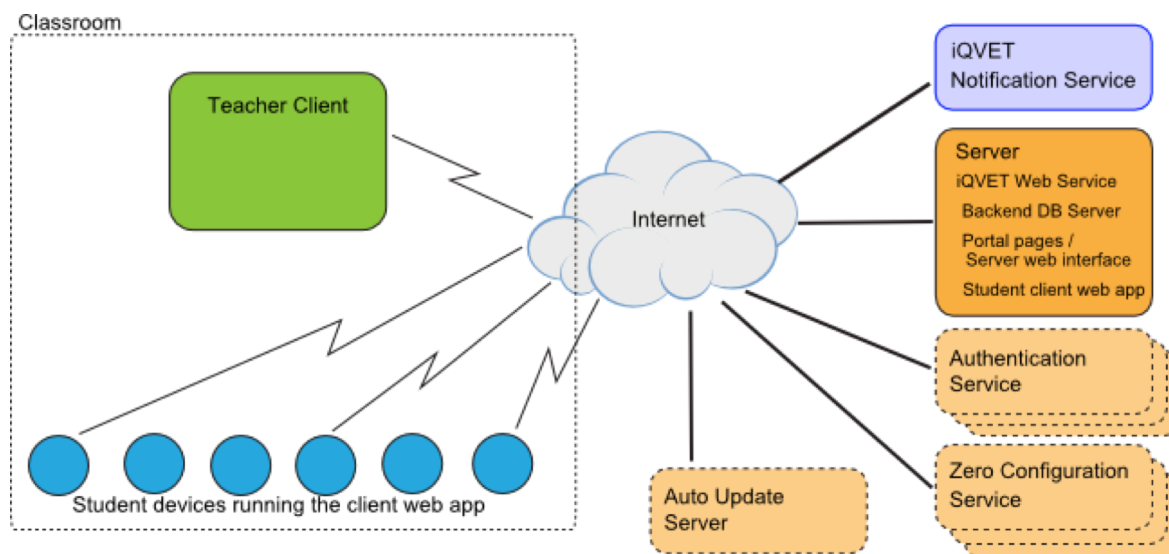
The system is based on a client-server architecture and the communication between the components is over the HTTP protocol. The main components of the system (figure below) are: a server application, a Notification service, a student client application and a teacher control application. The responsibilities of each component are defined as follows:

The server component includes the Eval webservice, the back end database (that in our case is collocated with the webservice, but by no means restricted to be collocated) and portal pages. The server also hosts the students' web app. The web service manages the central data model and keeps the entire system in a consistent state at all times. It provides an interface to remotely modify and read the productive resources following the "Representational State Transfer" (REST) principles. The web service is the main communication node and its data represents the "truth", if synchronization issues occur.

The Eval Notification service is aiming to allow the teacher to notify via short text messages the desired participants to join and answer a specific evaluation.

The teacher software is responsible for modeling the workflow for a given use-case. This is achieved by modifying the data inside the web service according to the required work-flow. The teacher role is granted write access to various parameters which allow for shaping a custom work-flow.

The student software usually reacts to the actions of the teacher. Again, the user interface has to implement the workflow for the respective use-case. A central aspect of the student client is the ability of being remotely controlled. According to the state of the data maintained in the web service, the student client may entirely block input or provide restricted read/write access to a set of resources.



*Eval System overview*

Apart from the main basic components the system includes few other components that aim at improving of the user experience and facilitating the system maintenance:

- The authentication service allows integration with other authentication methods and also allows the scenario when one user is accessing several servers.
- The autoupdate service allows the teacher client to update over the internet. When a new build is available it is published on the autoupdate location. The teacher clients will check that location periodically and will notify the user to update.
- The zero configuration service allows the teacher client to automatically retrieve the required information to connect to a certain server.

The Eval system is a web service in combination with use-case specific clients. During lectures, the system is controlled by the teacher and the student clients react according to the situation, thus generating an interactive environment with immediate feedback between teacher and students.

The ability of reacting to the teacher's actions poses certain challenges in the implementation, as the HTTP protocol does not specify a reliable back-channel for browsers yet. Possible approaches to address this issue are polling, long-polling or web sockets where each of which undeniably has specific drawbacks.

In this interactive environment, both the teacher's as well as the student's tools are designed to be streamlined. The amount of available options is kept small and the important functionality for the targeted workflow can be reached with a minimum amount of interactions. A quick interaction with the service is necessary because of the time pressure created in the interactive environment. Neither teacher nor students should get distracted or overwhelmed by special functionality. Any delay in usage of the tool directly causes the other users to wait for the intended change.

Outside the lecture, other clients (e.g. a dynamic web page) are available to work on the resources that have been collected inside the classroom. These tools can offer a rather complex user interface as the time pressure of a live system does not apply here. Typically, the teacher may create new or modify the existing content. Further, both teachers and students have read access to the collected data. Naturally, the teacher is allowed to see all data related to his/her lectures. Students usually only have access to unlocked data, further filtered for personal content. The data of other students remains entirely invisible.

## Applying the EVAL Quick Evaluation System in the BlueEDU project

EVAL has been designed to collect data fast and in real time during courses or events where the end-users may only invest a limited time.

**EVAL**  
Quick Evaluation System

Innovative Assessment System for Evaluation of Trainers and Quality VET Professional Programs

Pre-evaluation      Evaluation      Post-evaluation

Evaluate in 1-2-3

[www.blueedu.no](http://www.blueedu.no)

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In order to apply EVAL to gather data in the BlueEDU project, the instructor must do the following:

1. Prepare the question set that should be used with appropriate alternatives on multiple choice questions
2. Upload the question set into EVAL with the various alternatives
3. Test that the question sets are working on a mobile phone, a tablet and a PC. Check that it is possible to apply it on both the data- and the phone network.
4. Measure how long time it take for you to reply to a full survey.
5. Find 1-2 additional persons and ask them to help testing the survey. They you get feedback on the quality of the question set as well as how long time it take to complete the survey.
6. Train your self such that you know how to present the results to the audience, if there is some time available immediately after the data has been gathered.
7. Try to allocate from 30 to 60 min for gathering of data when attending an event.
8. Check that participants will have access to the service at the meeting venue and how many devices that may be connected in parallel. Ask if there is a time limit where inactive devices will be thrown out of the network.
9. Start by presenting the project shortly and what we want to achieve. Then start EVAL.
10. Let the responders get enough time during the time slot to reply to the questions. If there is a group of people replying, encourage them to discuss how they should interpret the questions. This helps ensuring that gathered data are of high quality.
11. If there is some time left towards the end of the data gathering session, present some of the data to the audience.
12. Complete the session by mentioning where and when the audience may get access to the results.

Notice that EVAL may be applied before an event starts, but also after an event. It is the instructor that at the end closes the evaluation.



## Eval quick start user guide

### Eval in a nutshell

Eval is a tool for quickly running evaluations with several question types (multiple choice, likert and freetext questions). Eval lets you run evaluations of activities that have already been completed (e.g. after a course), or activities ahead of time. For example: you can use Eval to measure pre-knowledge ahead of a course, which will allow you to adapt the course to the abilities and expectations of the course participants. Your evaluations can be answered using any kind of mobile device – such as mobile phones, tablets, laptops etc.

### Set up your account and log in

- a) Register your account at [www.one2act.no](http://www.one2act.no)
- b) Using the sign up form on the webpage will normally grant you teacher rights. If you register as a student and want to be granted teacher privileges then contact us on [support@one2act.no](mailto:support@one2act.no) to obtain them (this is needed to create and run evaluations).
- c) Install the Adobe AIR software from <http://get.adobe.com/air>. Adobe AIR is a supporting framework which needs to be installed before Eval can be installed
- d) Download and install the latest teacher application from [www.one2act.no](http://www.one2act.no)

### What do students need to use Eval?

Students use a web browser to answer evaluations, and all types of mobile devices such as smart phone, tablet, laptop or the like can be used.




### The student login page

Students enter the following address into a web browser

<http://app.one2act.no>

On this website they can create a user (if your system will not be used anonymously), and log in to answer evaluations.

### Set up your evaluation

- a) Click the  icon on the desktop to start Eval
- b) Log in using your user name and password
- c) Select **New Evaluation from scratch** option to create a new evaluation
- d) Follow the step by step wizard to select necessary options and defaults
- e) Customize the evaluation by adding questions and alternatives or by adding the text to questions
- f) Upload the evaluation to the server, which will generate a session code that allows students to join the session. Start the evaluation.

**Collect and respond to feedback**

- a. Instruct the participants of your evaluation to access the following web page: [app.one2act.no](http://app.one2act.no)
- b. Ask them join the session using the code you generated or their usernames if you require it
- c. In the evaluation tab you can see their responses in almost real time
- d. After you have stopped the evaluation phase, you can run follow-up questions using the built-in SRS like feature.

## Eval usermanual

### Registration

To get access to the service you need to register a user account. Registration is a 2-step process:



1. Register your account at [www.one2act.no](http://www.one2act.no)
2. Contact us on [support@one2act.no](mailto:support@one2act.no) to obtain teacher privileges for your account (this is needed to create and run evaluations).

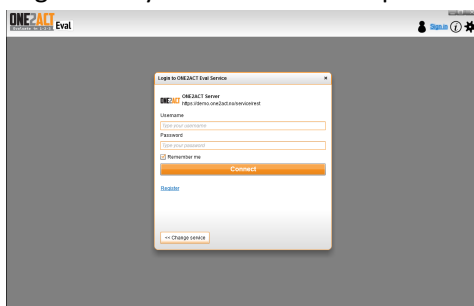
### Downloading and installing Eval

In order to create and run evaluations, you need to install the Eval software on your computer. This is done by following this procedure:

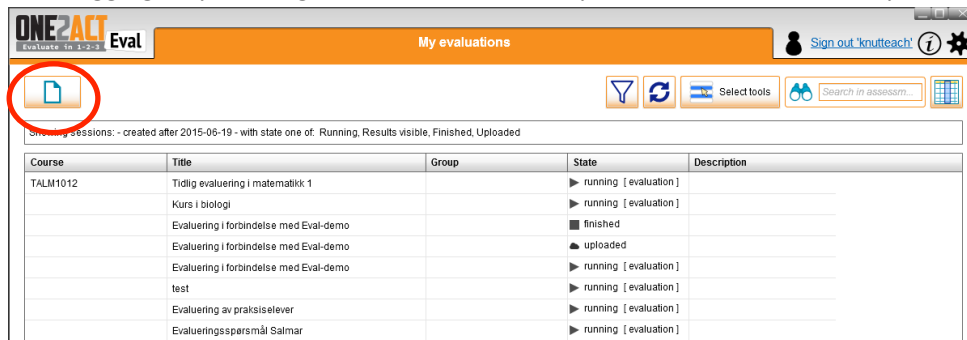
1. Check that the computer you're going to install the software on meets the technical requirements specified on page 28.
2. Install the Adobe AIR software from <http://get.adobe.com/air>. Adobe AIR is a supporting framework which needs to be installed before Eval can be installed
3. Download the latest stable teacher application from [www.one2act.no](http://www.one2act.no)

### Setting up an evaluation in Eval


1. Double-click the desktop icon  or  (or in the Start menu) to start the teacher client.
2. Log in with your username and password:

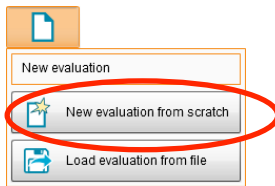


3. After logging in, you will get a list of evaluations you have run earlier (if any):

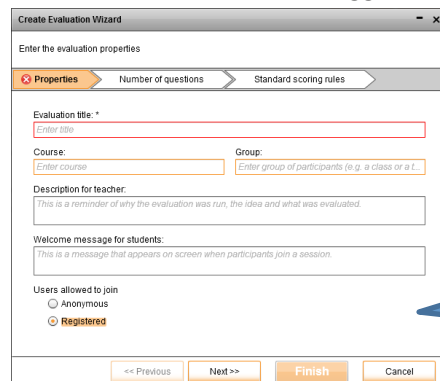


Course	Title	Group	State	Description
TALM1012	Tidlig evaluering i matematikk 1		▶ running [ evaluation ]	
	Kurs i biologi		▶ running [ evaluation ]	
	Evaluering i forbindelse med Eval-demo		■ finished	
	Evaluering i forbindelse med Eval-demo		▲ uploaded	
	Evaluering i forbindelse med Eval-demo		▶ running [ evaluation ]	
	test		▶ running [ evaluation ]	
	Evaluering av praksiselever		▶ running [ evaluation ]	
	Evalueringsspørsmål Salmar		▶ running [ evaluation ]	

4. You can now create the multiple choice evaluation by pressing the button  And then choose **New evaluation from scratch**:

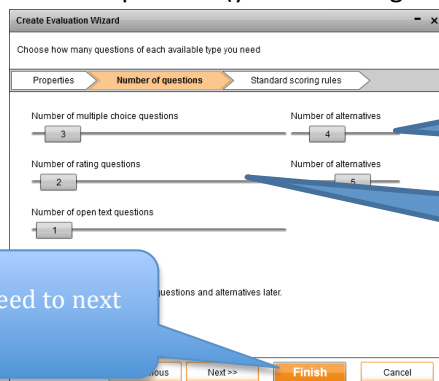


5. You will now be guided through a 4-step wizard where you set up the evaluation:
- Enter basic information about the evaluation, such as title, grade ("group") etc. You can also specify whether the evaluation can be answered by anonymous users, or whether students must be logged in to answer an evaluation.



Allow anonymous users?

- Enter the number of questions on the evaluation, and a default number of options for each question (you can change all this afterwards):

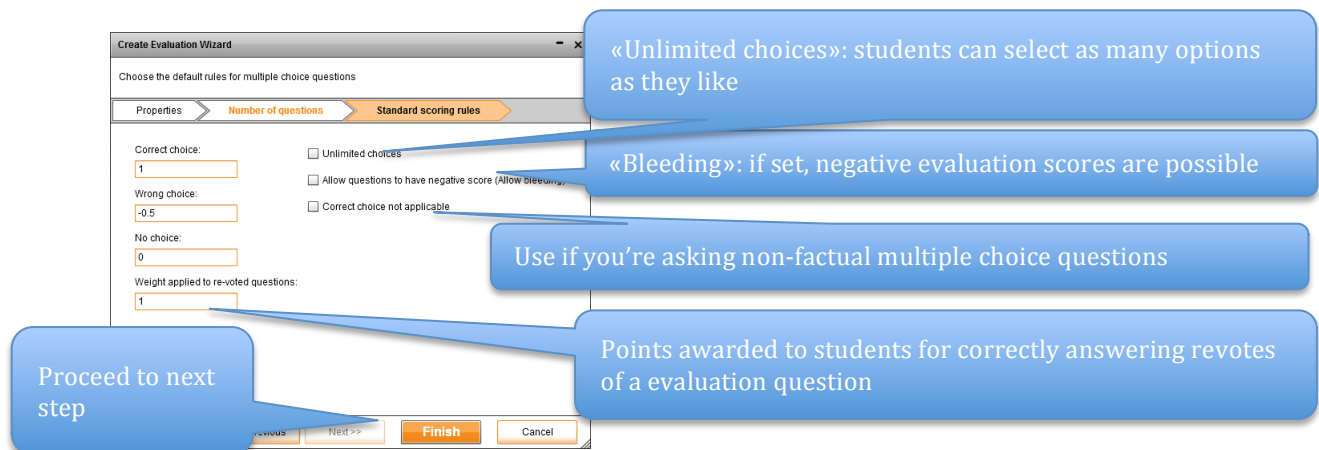


Proceed to next step

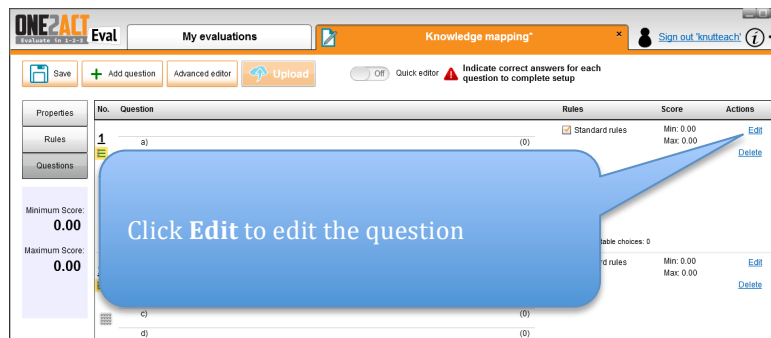
If you want to ask factual question, i.e. questions with right or wrong answers, use the multiple choice type

Rating questions: «on a scale from totally agree to totally disagree, to what extent you agree with this statement?»

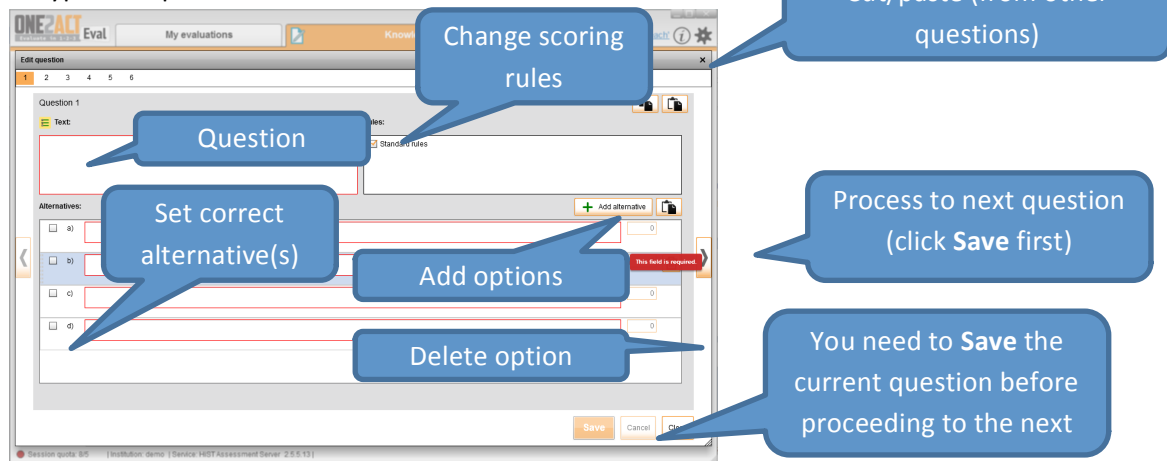
- Next you enter scoring rules, i.e. the number of points for correct/incorrect/no answer. These are only applicable if you're asking factual questions. You can also specify whether the evaluation allows negative total score ("bleeding") and whether students should get credit for participating in revoting sessions after the evaluation is completed.



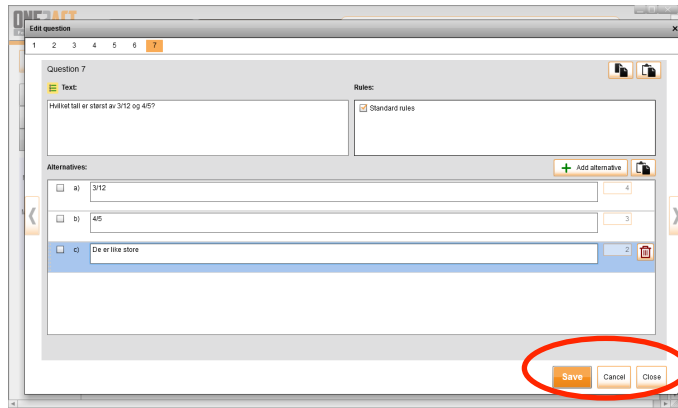
d. In the last step, you can add questions and options, as well as specify which options are correct.



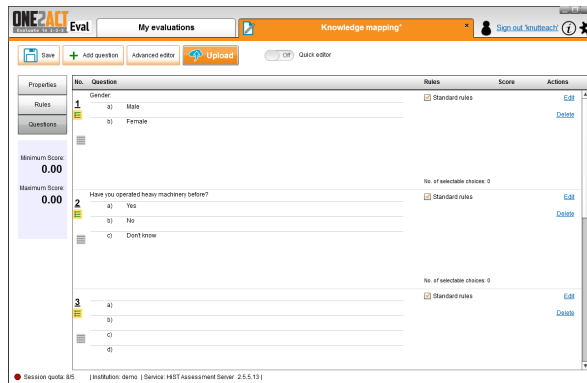
e. Here you enter the question text and the text for each option, and select which options are correct (if applicable). The image below shows the option for a question of type multiple choice:



f. Once you have filled in the last question and clicked **Save**, you can click **Close** to close the editor.




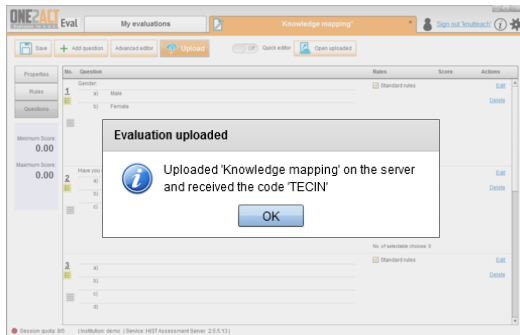
g. You will then get a list of questions like indicated in the image below:

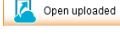


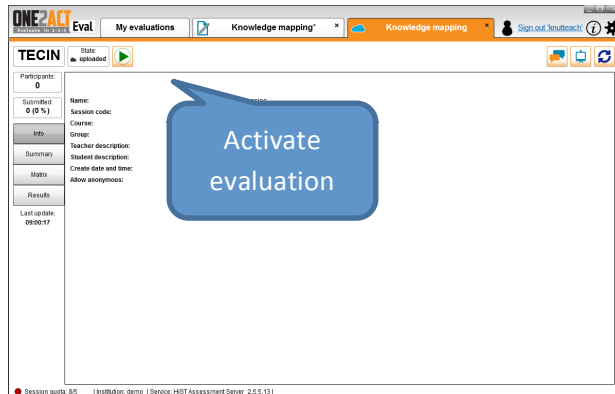
h. It is prudent to save the setup as a file on your hard drive, which you do with button




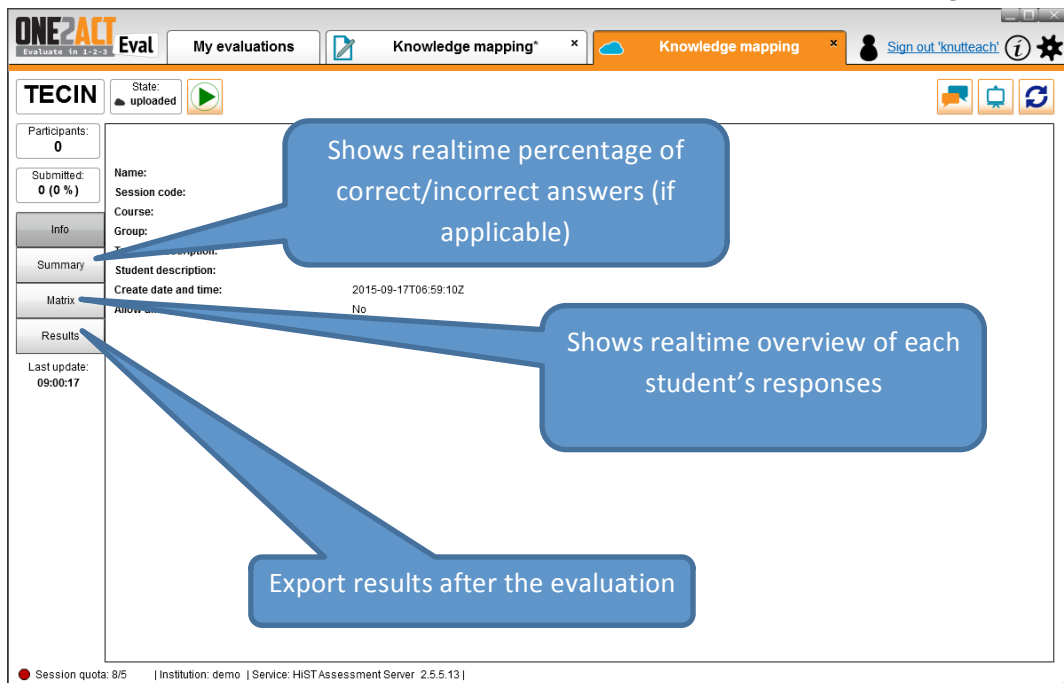
6. Click the button  once you have made all of the desired adjustments. The system will acknowledge your upload with a message indicating that a session code has been generated:



- By default the evaluation only uploaded to the system; it is not activated yet. If you wish to activate it immediately, you can press the button  in the top toolbar – this will bring up the control panel for the selected evaluation:



- From here you can activate the evaluation, so that students can answer it. This is done with button . Once the evaluation is activated, the interface will look like the image below:

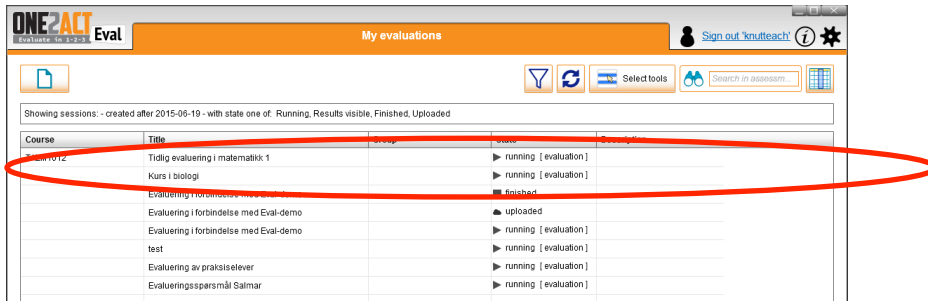


## Running Eval evaluations

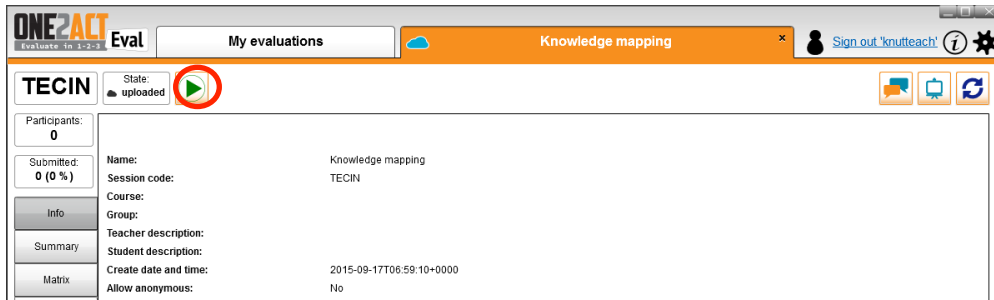
In this section we describe how Eval can be used before, during and after a course or a training session.

### Initiate and monitor the evaluation

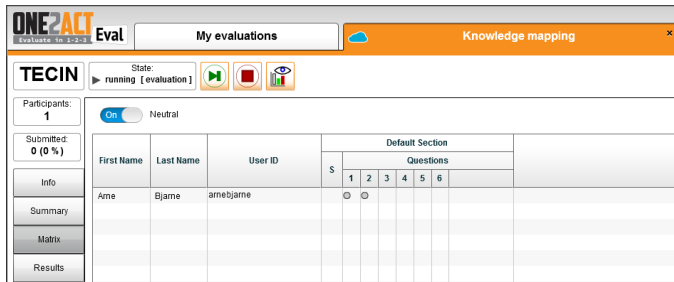
- If you have already started/activated the evaluation, you only need to give the session code to students to enable them to log in and start answering the evaluation. Depending on whether or not students are present physically, the session code can be given to them during the training session, or, if students are not present physically, posted on a website or by email.
- If you have not started the evaluation yet, log in to Eval and find your evaluation in the list below:



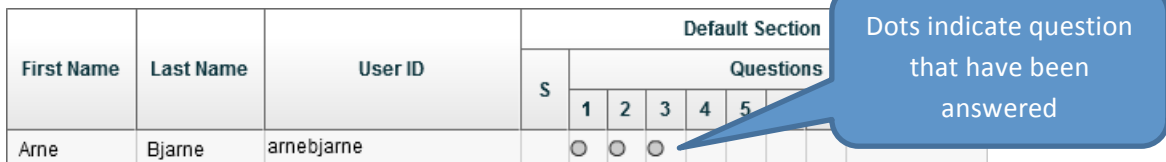
3. Double-click the evaluation you want to run, and then press to start the evaluation.



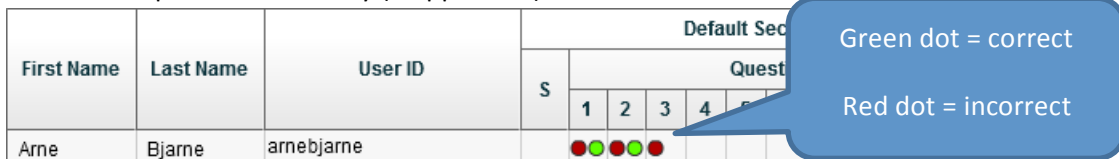
4. Clicking the button will bring up a continuously updated list of logged-in students:



5. As students begin to answer the evaluation with their mobile devices, this will be indicated on the screen:

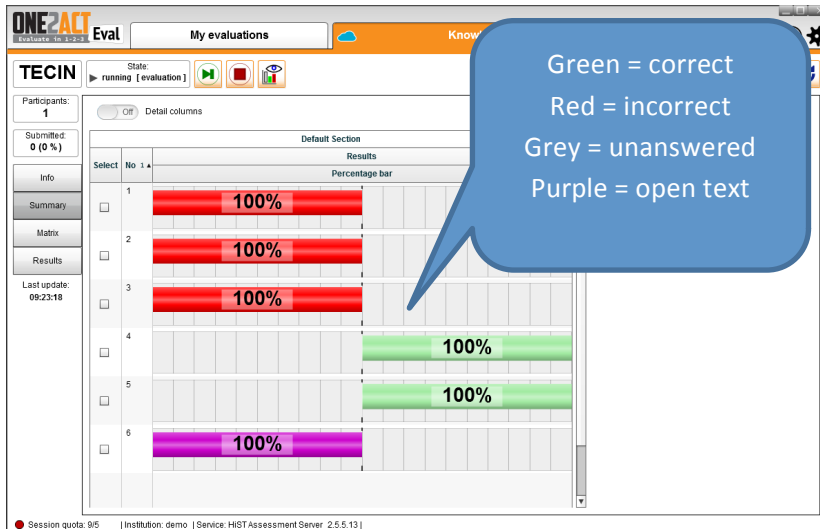


6. You can press the button to see whether a particular student has answered the various questions correctly (if applicable):

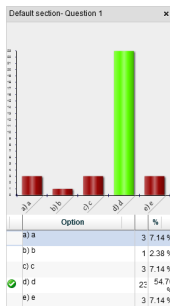


7. Click the button to get see the total percentage of correct/incorrect answers on the evaluation questions. If you're doing knowledge mapping in preparation for a course, you can rapidly identify problem areas that that you can address during the course:




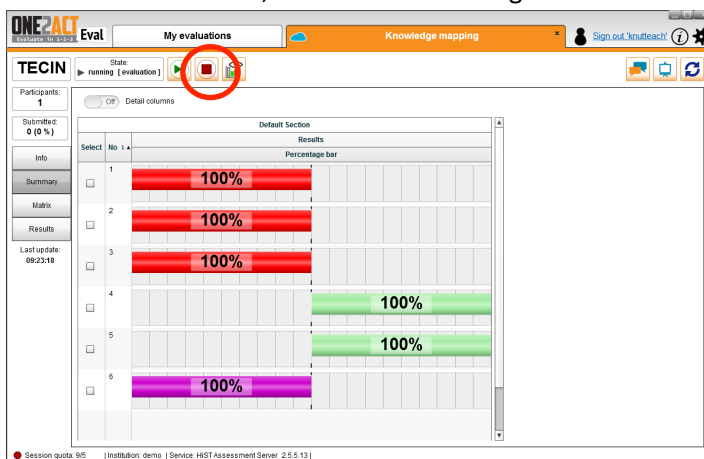




8. Clicking one of the graphs, which are updated in real time, brings up a histogram of the distribution of responses to each question:



### Ending the evaluation

9. To end the evaluation, press the button  in the top toolbar, as indicated below. Once the evaluation has ended, students will no longer be able to answer the evaluation.



10. If there is a need to reopen the evaluation (eg. if some students did not manage to submit due to technical problems), you can reopen the evaluation with  and then finish the evaluation with .


### Reviewing and addressing responses

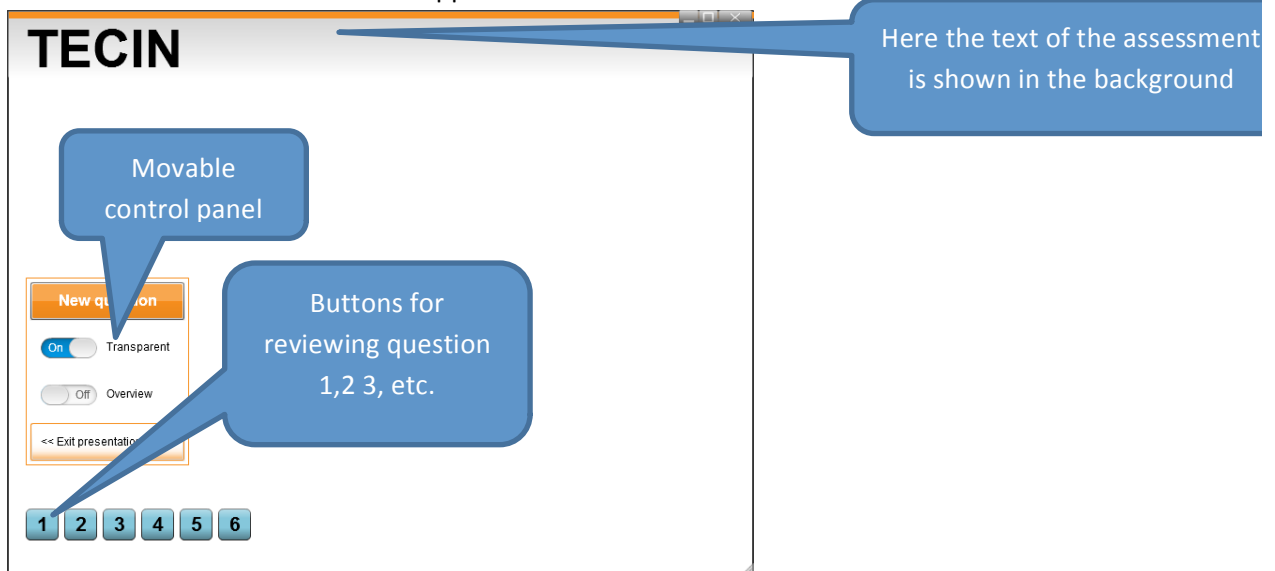
If you have asked factual questions ahead of a training session which highlight problem areas or knowledge gaps, you can use Eval to systematically address those issues during the training. The


same goes for any type of knowledge mapping or measuring of attitudes or opinions at any stage of a course: Eval can be used to review the responses together with the students – e.g. in order to clarify misunderstandings (perhaps the students did not understand your question) or to follow up any input given to you by the students.

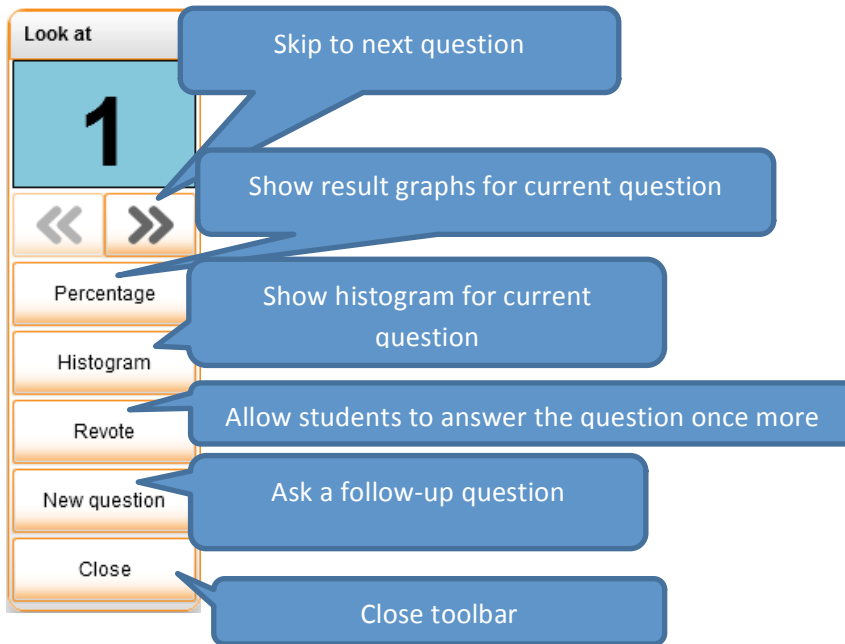
If you're going to review the questions away from the students, then everything is ready for you once you've stopped the test – you can see the result graphs and read any text responses from the **Summary button**.

The following section assumes that you've completed an Eval evaluation, and you're going to review it with the students present.

11. Eval has a so-called **presentation mode** which is useful for the review phase. This hides most of the interface and makes the Eval window transparent. You switch to presentation mode with button . The interface will appear as shown below:




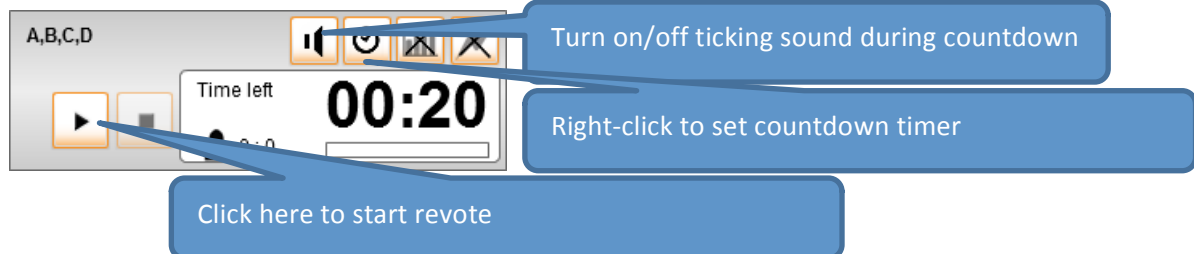
12. Click the button  (or the number for whichever question you wish to address), which brings up the floating toolbar below:



### Letting students answer a question again (revoting)

If the evaluation detected knowledge gaps, or other issues which should be addressed (e.g. students misunderstanding a question, and therefore inadvertently giving misleading answers), students can be allowed to answer questions again in a revoting session.

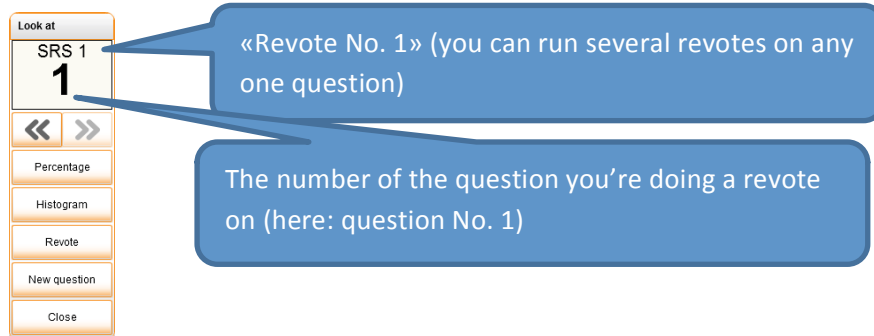
To start a revote on the current question, press the button  in toolbar for the current question. It will then bring up the control panel shown below:



When the countdown is over and the voting is finished, there will be a button in the toolbar below the main menu:



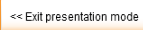

By clicking the button which just appeared, you get a toolbar similar to the one for the original question:

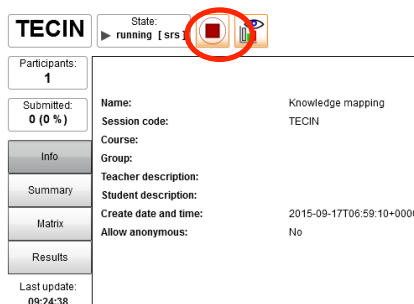


To run another revote on the same question, press the **Revote** button again.

You can also ask follow-up questions with the **New question** button – this allows you to ask a new multiple-choice question (note: it is not possible to ask rating-type questions or open text questions from this control panel).

### Publishing results to students

If you want to make the evaluation results available to the students (e.g. if you asked factual questions with right/wrong answers), you do that by first clicking  to leave presentation mode, and then click  in the top toolbar:



When students log in from their mobile devices with the session code used for the evaluation, the evaluation results will be presented to them as shown in the image below:



## Sorting and exporting data

### Sorting and searching in previous evaluations

In the tab **My evaluations**, which is shown by default on login, you will find the tools to search and organize evaluations that you have run (or prepared, yet to be run). Below is a brief explanation of the various tools (some of which will not appear until you have clicked on and highlighted a particular evaluation):


The screenshot shows the 'My evaluations' tab in the ONE2ACT interface. The toolbar includes icons for Open, Clone, Finish evaluation, Publish results to student, Delete evaluation, Filter, Select tools, Search in assessment, and Select columns. Callouts provide the following descriptions:

- «Clone» - creates an identical copy of the evaluation, with a new session code
- Finish evaluation
- Publish results to student
- «Archive» - change status to «archived»
- «Filter» - only show evaluation fulfilling some criteria
- Tool to select several evaluations
- Search for words, subjects etc.
- Select columns to be shown in main view


### Exporting data

The results of an evaluation can be exported to a spreadsheet. This is done by double-clicking on an evaluation to get the toolbar shown in the image below:

The screenshot shows the 'Results' button highlighted in a red circle in the 'My evaluations' tab. The interface displays details for the evaluation 'TECIN' with a state of 'running [srs]'. The 'Results' button is located at the bottom of the left-hand menu.

To export all data from an evaluation, use button , which brings up this menu:

The screenshot shows the 'Results' menu with the 'Export To XLS' button highlighted. The menu also includes a 'Show Results Table' checkbox and a 'Results' button at the bottom.

Push the button  to export evaluation data to an Excel spreadsheet.

## **Asynchronously running evaluations**

In some cases the evaluations need to be run for a group of people that will not be working on them in the same time and place. The trainer can create an evaluation and upload it to the server and start it. Afterwards he can send to the participants an email with the address for the student client, the session code and other instructions.

When creating such evaluations it is important to add the text for the questions and the alternatives as the participants need to have all the required information on the device so that they can answer.

The students can answer partially the evaluation and then continue it from where they left it by logging in to the same session.

The teacher can connect to the evaluation as many times as she needs to see the progress of the participants. When the time to end arrives the teacher needs to connect to the evaluation and hit the **STOP** button.

## **Leaving the evaluation running**

Unless you explicitly end the test using the **STOP** button, the evaluation will be open indefinitely. This means that you can set up an evaluation that will be left open for some time – e.g. running a post-course evaluation which is kept open for one week after a course.

Note that exiting the Eval client does NOT stop the evaluation – you have to manually end it.

## **Reconnecting to an open evaluation**

You can reconnect to an evaluation that you left open after you've logged in to Eval:

## **Tips and tricks**

### **Text on mobile**

When adding text to the questions, keep in mind that the users might respond with a rather small screen. Keep text short and to the point.

### **Verifying**

It is a good idea to verify your tests before actually running them in order to spot potential problems. For this bit it is always handy to use the **Save** and **Load** evaluation features.

### **Errors**

There are a lot of reasons that might cause errors. If you get lots of errors it might be that your network connection is down. Always check if you can access the internet and the server (try loading [www.one2act.no](http://www.one2act.no)). Sometimes it might help to just restart the teacher client and try again. If you send an error report make sure you send all the possible details in the comments.

### **Reporting problems**

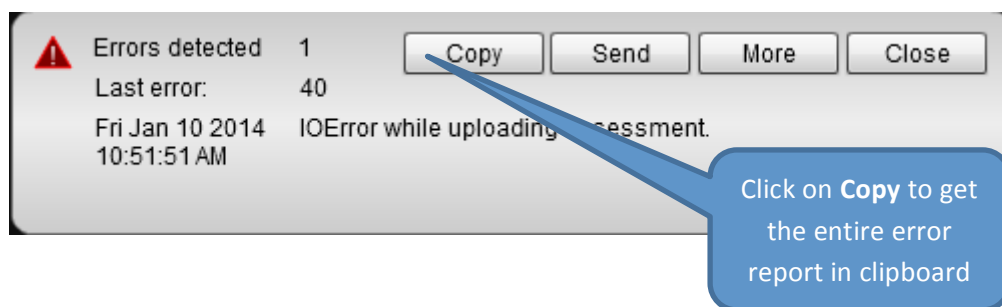
When errors and exceptions are occurring a notification usually appears in the top right corner of the screen.

One can expand the notification by clicking **More** to get more details. Usually the information there is very technical and intended to be sent to the developers.

Click **Copy** to get the error report into the clipboard. This is useful when there are a lot of errors and the report is really large. This is the recommended way to get the error reports. Afterwards just paste this in an email message and send it according to the instructions

When clicking **Send** the application will attempt to open the email client with the error report already prepared and you just need to add your comments and send the message. This operation is not guaranteed to always open the email client (it depends on the email client you have and the size of the report). When this fails, use **Copy** to get the error report.

The error report includes information about where to send it.



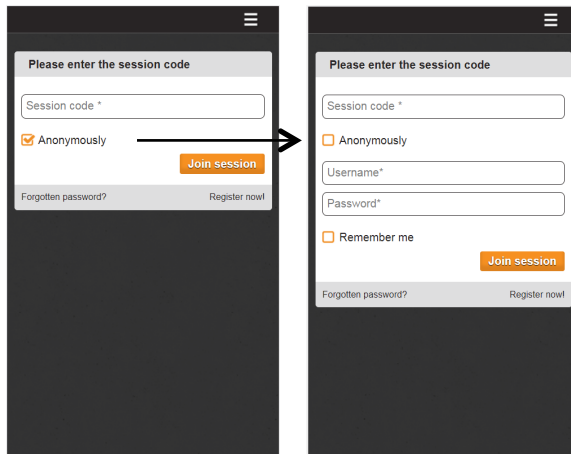
**Important:** You should always add comments to your bug reports. Describe the best you can the context in which the errors occurred. The most important information is how one can replicate the problem.

## The student client

The student client, which the students use to answer your evaluation, is entirely web-based. This means that it will run on any mobile device with a relatively standard web browser and internet access.

### Registering and logging in

1. The students answer your evaluation by accessing the following web page: [app.one2act.no](http://app.one2act.no)  
They will then get a web page like the one below:



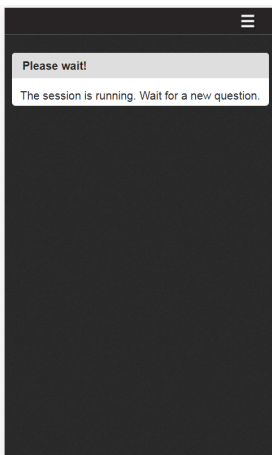
2. If you enabled anonymous login for your evaluation, the students can access your evaluation by typing just the session code



- If only registered users can participate, and they haven't already created an account, they need to do so by clicking **Register now**, and fill the form shown in the figure below.

The screenshot shows the 'ONE 2ACT Registration' page for the 'Peer Learning Assessment System'. The main heading is 'Registration' with the sub-heading 'Peer Learning Assessment System'. Below this is a section titled 'Student Registration'. The form contains the following fields: 'Username \*', 'Password \*', 'First Name', 'Last Name', 'Email \*', and 'Institution \*' (a dropdown menu). A red 'Register' button is located at the bottom of the form.

- Once the students have registered, they will be taken back to the login page where they log in using their chosen credentials.
- Once logged in, the students will get the waiting screen until the questions are available:

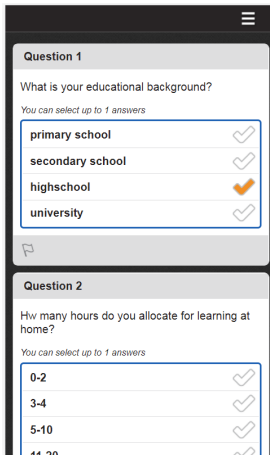


- After starting the session, the students can then answer the evaluation, starting directly on question 1:

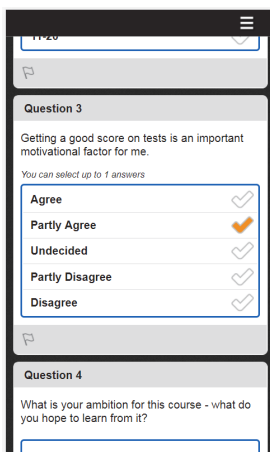
The screenshot shows a mobile interface with two questions. 'Question 1' asks 'What is your educational background?' and lists four options: 'primary school', 'secondary school', 'highschool', and 'university', each with a checkmark. 'Question 2' asks 'Hw many hours do you allocate for learning at home?' and lists four options: '0-2', '3-4', '5-10', and '11-20', each with a checkmark. A hamburger menu icon is in the top right corner.

Here both the question and the alternatives have text written into them

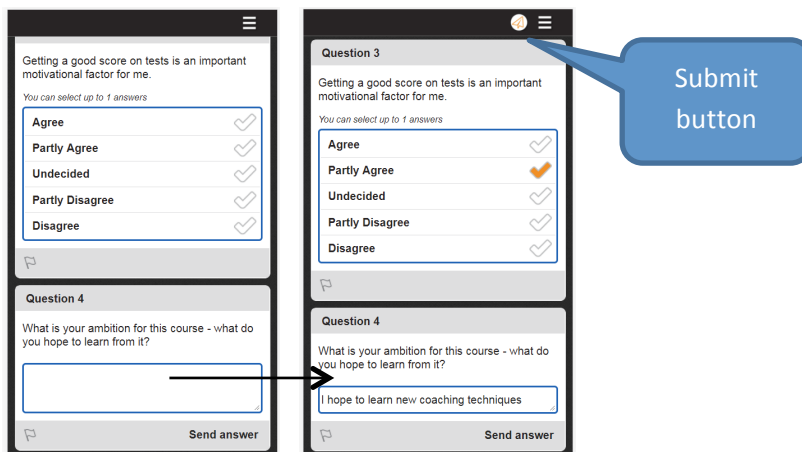
7. As a visual indication that a question has been answered, an orange checkmark appears, and the frame stays blue, as shown below. If an error occurs the frame will turn red



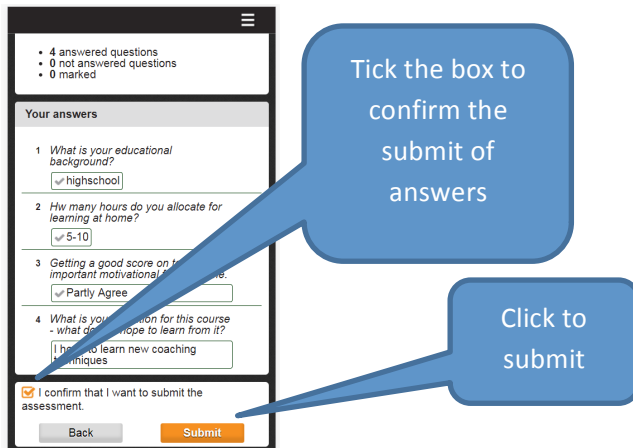
8. To go to the next question, students can scroll down to the next question.  
 9. The figure below shows what a likert question looks like for the students:



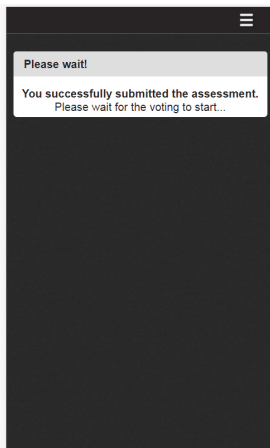
10. The figure below shows an open text question being answered.



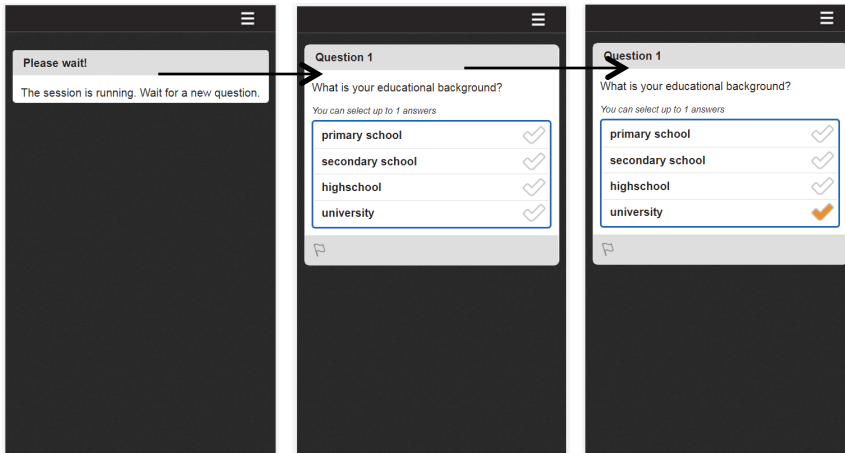
11. Once all the questions have been answered, a submit button will appear at the top of the screen
12. To start the submit process, in which the student finalizes the evaluation, they either click on the submit button or use the app menu option. They will then be asked to confirm their answers, as shown in the figure below.



13. As a confirmation of a successful submit, the students will be taken to this page:



14. If the teacher will choose a re-vote the question will appear on the student screen (for example if a question was misunderstood by many students during the evaluation).



## Technical Specifications / System Requirements

### Internet access

Both the computer running teacher interface, as well as students' mobile devices must have internet access

- Wireless internet (Wi-Fi)
- Wireless Broadband (3G / 4G)
- Wired internet (ethernet)

There is **no requirement that** all devices are connected to Internet in the same way - you may well have some devices connected via Wi-Fi; some via 3G / 4G etc.

### *System for wireless internet (Wi-Fi)*

If WiFi is used, the wireless network must meet the following minimum requirements:

- IEEE 802.11 a, b, g or n
- The wireless access points must be able to handle a sufficient number of concurrent devices - such as a minimum: the number of concurrent students to use Eval. One must take into account that one and the same student gladly have two mobile devices that use wireless internet (eg. Mobile phone and laptop).
- Download and upload bandwidth of the institution must be at least 5 kbit / s per student

### *System requirements for wireless broadband (3G / 4G)*

Students can be connected via 3G / 4G. However, a condition that the coverage is sufficient that a transmission rate of 5 kbit / s per student can be maintained.

### *System requirements for the wired LAN (Ethernet)*

If students use computers connected wired internet, there is no specific system except that the bandwidth per student is at least 5 kbit / s.



### System requirements for computer running teacher interface

- Note: Administrator rights are required to install a teacher interface. If you do not have such rights, one must consult local IT services.
- Supported operating system: Windows<sup>®</sup> XP (with SP3), Windows Vista<sup>®</sup> (with SP2), Windows<sup>®</sup> 7 (with SP1), Windows<sup>®</sup> 8
- Processor: Intel<sup>®</sup> Core<sup>®</sup> 2 Duo E6700@2.6 GHz or higher, AMD AthlonT64 X2 6000+ @ 3.0 GHz or better
- RAM: 2 GB Windows<sup>®</sup> XP / 4GB Windows Vista<sup>®</sup>, Windows<sup>®</sup> 7, Windows<sup>®</sup> 8
- Disk Space: 5MB
- Sound card and speakers
- Mouse or other control device
- Internet access (wired or wireless)

### System requirements for students' voting devices



- Supported operating systems: Windows XP / Vista / 7/8, Mac OS X 10.6 or later, iOS 6 or higher, Android 4.1.5 or newer
- Internet access through either wireless (Wi-Fi), wireless broadband (3G / 4G) or wired Internet
- Browser such as Internet Explorer 7 or later; Chrome; Firefox; Safari