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Introduction

One of the activities in the TALOE project was implementation with case studies, WP5. Within this activity it was planned to test and evaluate developed TALOE web tool, especially its usability and the quality of the results on selected case studies and by real users.

The main idea for development of TALOE web tool was to provide teachers with a tool that would, by analysing the provided courses' or modules' learning outcomes, offer the most appropriate e-assessment methods consistent with the intended learning outcomes. In order to see if the produced TALOE web tool has succeeded in achieving the set goal, testing phase is a necessary and important step in the life cycle of application development.

The planned minimum number of case studies was seven, one for each partner in the project. It was planned that the cases chosen are diverse and representative of various learning contexts, including higher education, vocational training, online modules etc. In the end, testing was done on many more case studies than planned and with four invited stakeholders by each project partner. This enabled better feedback and quality of testing results.

The partnership produced a first version of the web-tool at the beginning of 2015 and started with the initial testing of the first platform functionalities. All project partners agreed to simplify the tool procedures during the first phase of testing due to the complexity of the ALOA model (Falcao, 2013). The tool will be further developed in phases of complexity of the definition of the procedures relating to the learning outcomes and assessment methods. This is an extra effort to achieve consistency of the web-tool performance and simplicity of procedures by potential users.

The present version of the TALOE web tool does not discriminate between knowledge types, as suggested by the theoretical model. After initial testing of the set up matrix it has been confirmed that the matrix is working properly. The best (most appropriate) e-assessment methods are selected on the base of the absolute matches between input (learning outcome) and the e-assessment methods.

For testing purposes, an evaluation form was prepared.

After initial testing it was decided to evaluate the TALOE web tool in two phases.

First phase testing was done with 18 collected case studies and performed by the project partners to see if the suggested e-assessment methods are closely related to the defined learning outcomes. The results showed that the majority of the teachers have defined the appropriate e-assessment methods for the learning outcomes. In some cases, the TALOE web tool suggested additional possibilities in terms of e-assessment methods. For several cases the TALOE web tool indicated that the existing assessment methods should be revised.

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In order to perform the second phase testing, the evaluation form was added to the TALOE web tool site to make it available online. Second phase testing was done with invited stakeholders. In total 31 participants (stakeholders) evaluated the tool. The analysis of received feedback showed a positive evaluation regarding the usability of the tool and the quality of the output/results, i.e. the e-assessment method suggestions. Invited users found this tool easy to use and useful but would like to see it improved for more complex testing. These results also confirmed that the web tool provides support and guidance to teachers to formulate the learning outcomes in accordance to Bloom taxonomy, as intended and planned by the task. It also increases the accuracy of e-assessment methods received by the tool and the alignment between learning outcomes, assessment techniques and teaching methods.

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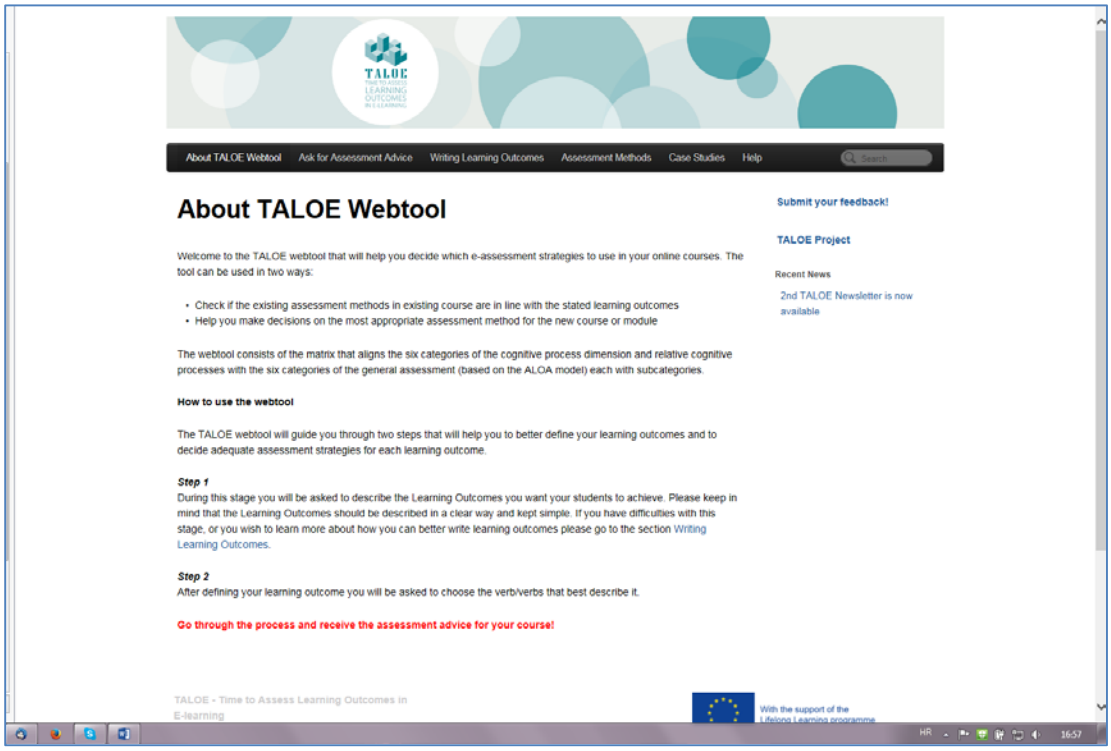
TALOE web-tool

The TALOE web tool (http://taloe.innovate4future.eu/) is being developed to help teachers and educators decide on the assessment strategies to use in their online courses. The tool is envisioned to be used by teachers, either to check if the existing assessment methods of their course or module are in line with the stated learning outcomes, or to be advised on the most appropriate assessment methods for the existing or new course or module.



Interface to the TALOE web tool

One of the first tasks in the development of the TALOE web tool was to extend the ALOA model (which links learning outcomes and assessment tasks) and set the matrix for aligning cognitive processes described in the learning outcomes and the categories of the e-assessment methods. The decision engine consists of the estimation of the score that measures the best match between the cognitive processes submitted by the user and the specific ones of a given assessment method.

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When describing a learning outcome, the teacher chooses up to three verbs that will best describe it. This step also enables the user to check and review the defined learning outcome. After describing the learning outcome with verbs, the teacher sets the process in motion and receives an assessment advice for the defined learning outcome. The received outcome provides a list of potential e-assessment methods to use, with the corresponding description. The basic info about the learning outcome and the ALOA model are also available within the TALOE web tool. Therefore, the TALOE web tool can be used in two ways: to check if the existing assessment methods in a existing course are in line with the stated learning outcomes; and to help users decide on the most appropriate assessment method for a new course or module. The TALOE web tool can be used to learn more about learning outcomes, assessment and e-assessment, as it provides guidance to teachers to formulate the learning outcomes in accordance to Bloom taxonomy (Bloom, 1956).

Survey results

In order to perform testing, the evaluation form is divided into four sections:

- General information about the course/module/lesson
- Evaluation of the TALOE web tool (consisting of nine close-ended questions – Likert scale)
- Suggestions for improvement (three open-ended questions)
- Demographical questions and contact

The evaluation form has been published online (prepared in Google Docs) for the second phase testing. For the first phase testing project partners filled the evaluation form as a Word document.

First phase testing

The first phase testing was done with collected case studies (18) to see if the suggested e-assessment methods are closely related to defined learning outcome. The TALOE document "WP 3.01- E-assessment practices" (Lõssenko, 2014) brings the description of the case studies with selected learning outcomes and e-assessment methods used in the first phase testing.

Testing was done by choosing one of the learning outcomes from the selected case study and then describing it by using three verbs of the Blooms revised taxonomy (Anderson, Krathwohl & Bloom, 2001). This information was fed to the TALOE web tool to check the e-assessment methods.

Partners encountered some difficulties when trying to describe a learning outcome with three verbs as some of the learning outcomes were not clearly defined. They were defined more as learning objectives as they have indicated the area/content that the teacher intends to cover in the course. Another difficulty was that the defined learning outcomes were not clearly correlated with the

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specific assessment method so it was difficult in some cases to make comparisons between planned e-assessment method (by teacher) and suggested e-assessment method (by TALOE web tool).

Results showed that the majority of the teachers planned a variety of assessment methods such as: forum discussions, written assignments and online tests, self-evaluation tests and some practical activities and that they are in correlation with the suggested e-assessment methods by the TALOE web tool. In some cases the TALOE web tool suggested additional possibilities of the e-assessment. In several cases, the tool indicated that the existing e-assessment methods should be revised.

Examples:

Learning Outcome 1
Able to practically apply and connect the content of music theory, music pedagogy and teaching the main subject
Planned e-assessment methods:
Forum discussions, critical assessment, written assignment
Suggested e-assessment methods:
Practical work – open ended enquiry, MCQ-apply, problem solving generation

Learning Outcome 2
Be aware of linguistic features of selected registers of contemporary English
Planned e-assessment methods:
Online tests, written assignments, discussion forums
Suggested e-assessment methods:
Essay- discuss, MCQ, Essay- assertion

Learning Outcome 3
Understand the importance of establishing and maintaining the potential of the cell membranes through integration of the knowledge from physics, chemistry and biology
Planned e-assessment methods:
Online assessment, MCQ test, discussion forums
Suggested e-assessment methods:
Essay- discuss, easy describe/explain, essay- compare

It should be also taken into consideration that no explicit instructions were given to teachers about how to describe the e-assessment methods while filling in the case study template, so their descriptions of the e-assessment method and those proposed by the TALOE web tool were different (i.e. test, written exam, MCQ quiz, MCQ test, online test...)

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After the first phase testing which was done on 18 collected case studies, feedback from the project partners was collected and the TALOE web tool was additionally improved according to the suggestions.

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Second phase testing

The second phase testing was done by invited stakeholders. Each project partner invited at least four stakeholders to test the TALOE web tool. A total of 31 tests of the TALOE web tool were made and feedback was collected in April 2015.
For the purpose of this testing the evaluation form was made online and added to the TALOE web tool (www.bit.ly).
The participants in the online testing could remain anonymous as demographical questions were optional, except the question about the home institution. Nevertheless, the majority of participants left their contact and wanted to receive further information about the TALOE project and web tool. This was important since it reveals the relevance of the TALOE project results to the stakeholders and helps the Project Consortium build a database of stakeholders for dissemination and exploitation activities.

Question 1: The TALOE web tool is easy to use

The majority of participants found TALOE web tool easy to use. This is an important feature as it influences the teacher's attitude towards the use of this web tool.

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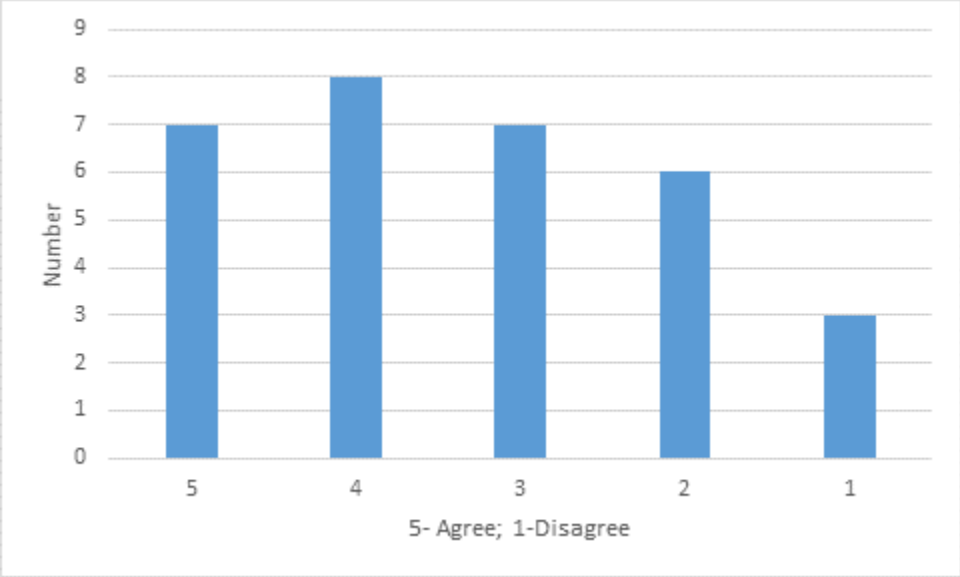
Question 2: I can use the TALOE web tool without any written instructions



In this question answers are equally distributed in opinion about the friendliness of the tool. Some participants could use it without any written instructions but more than half of participants stated they needed instructions on how to properly use the tool.

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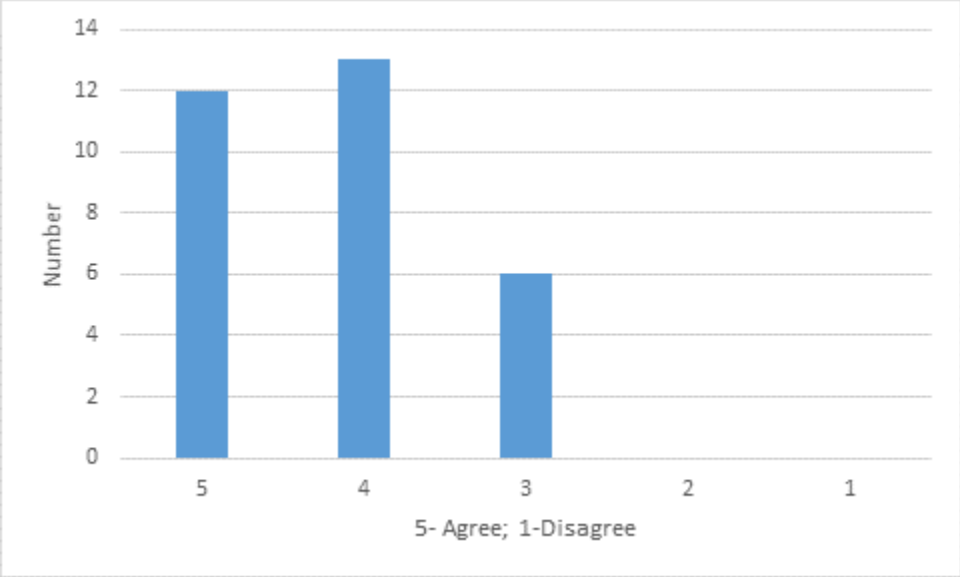
Question 3: The TALOE web tool is useful



Although participants needed instructions to use the tool, the majority found it very useful.
Some participants (19.35%) did not have opinion about its usefulness, respectively they did not find it useful nor useless. This can also depend on their knowledge and experience in defining learning outcomes and the extent to which they have been achieved. Those more experienced may find it not as useful as they are quite experienced in writing the learning outcomes and linking them with teaching and assessment.

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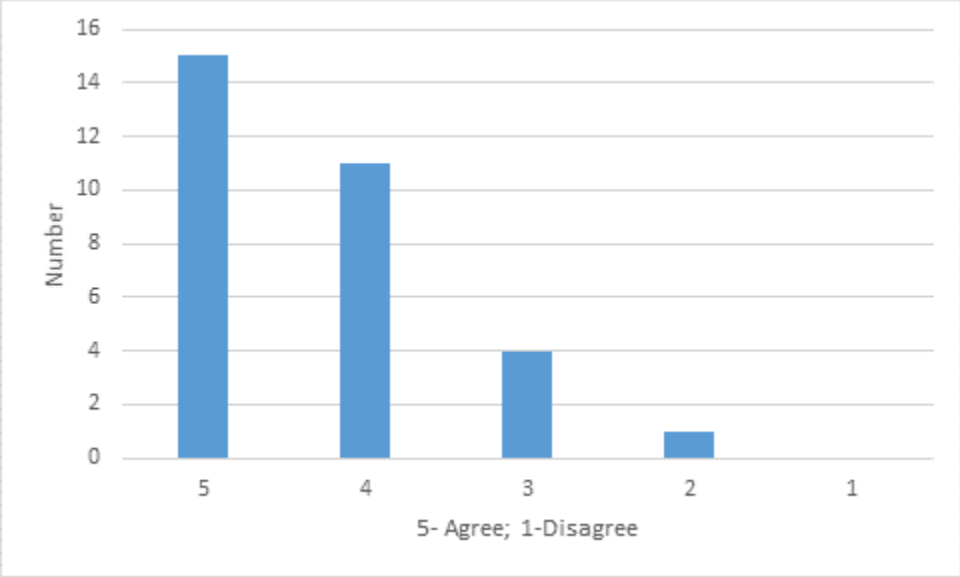
Question 4: I quickly became skilful with TALOE web tool



83,87% of participants found the tool easy to use or became quickly skilful with it by reading the posted instructions.

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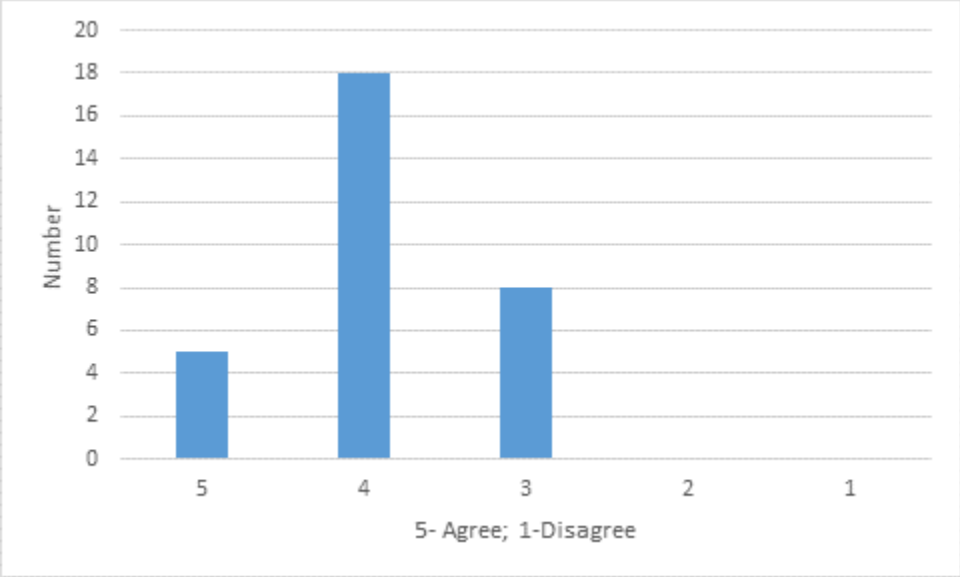
Question 5: The TALOE web tool provides good, quality results



Results achieved by the TALOE web tool are of good quality. Some participants could not conclude about the quality of the results received.

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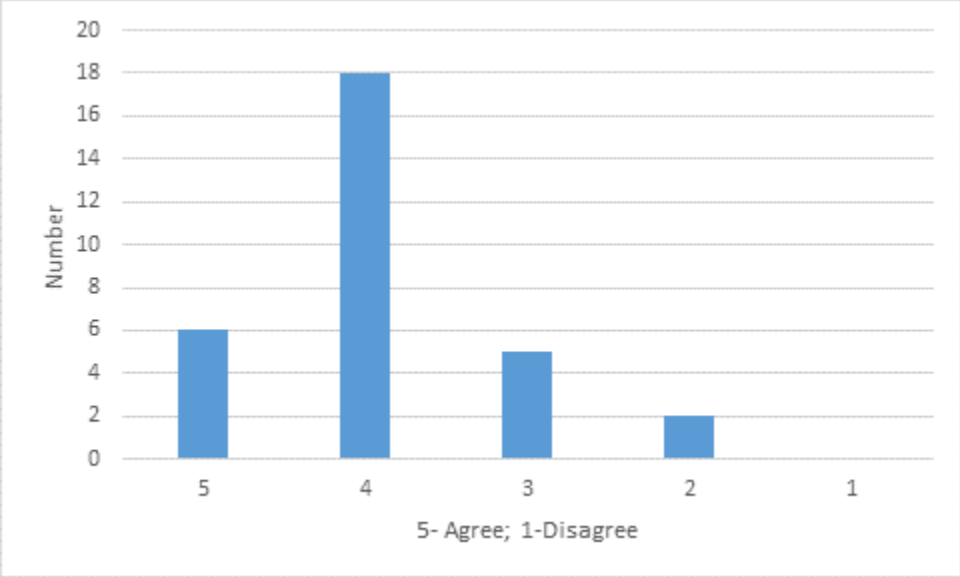
Question 6: The provided results are in agreement with my plan



The majority of participants found received results in agreement with their plan. Only 22.58% of them found that they should revise their e-assessment methods and learning outcome.

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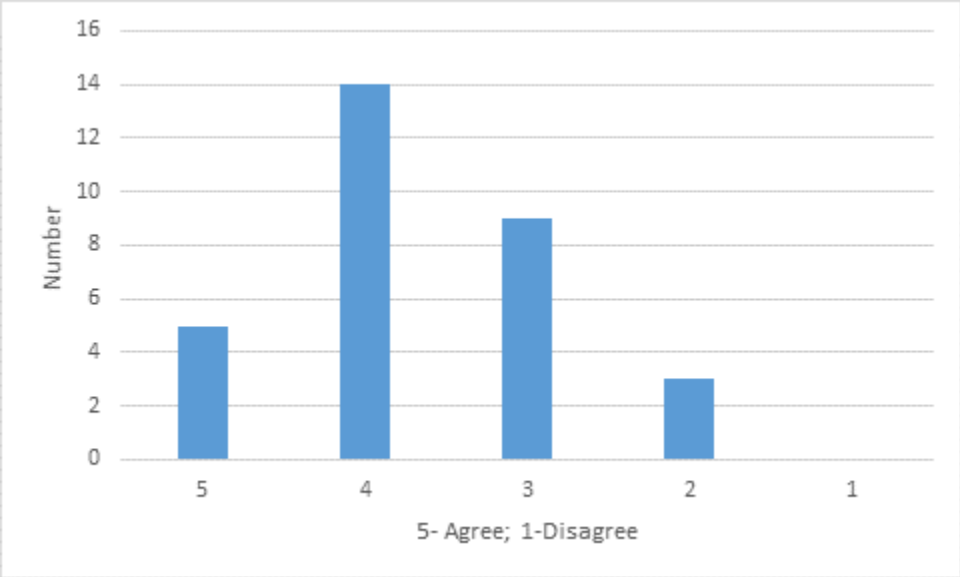
Question 7: The TALOE web tool enabled me to better align assessment methods to the learning outcomes



Although the majority of participants found the tool useful, a large number of participants needed more information about how to move beyond the identification of appropriate assessment methods to the implementation phase.

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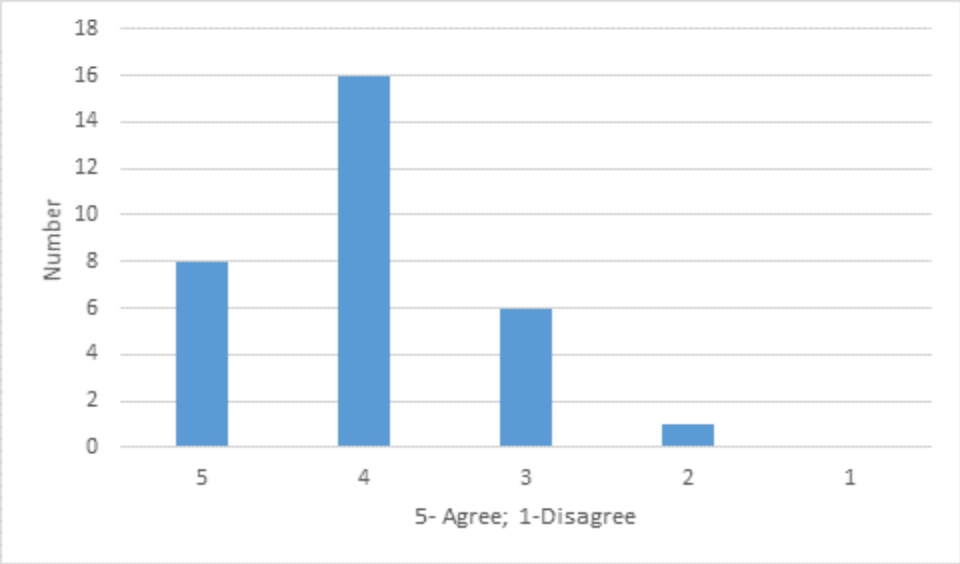
Question 8: The TALOE web tool helps me understand how to define the assessment methods better



The majority of participants, as in question 6, find TALOE web tool can help them to understand how to define the assessment methods better.

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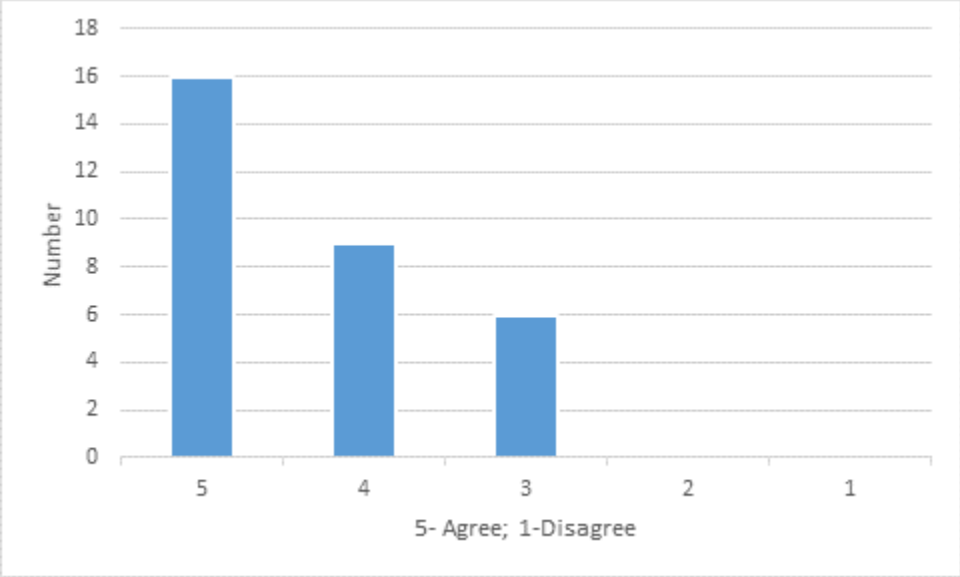
Question 9: I would recommend the TALOE web tool to a friend



The majority of participants would recommend the TALOE web tool to a friend; still, there are some of them who are not sure about it.

Question 10: What features would you change?

- *The tool is very straightforward but therefore it's not at all subject sensitive. LO is not just about the verb. Assessment is not just about task but there is also about grading system, use of assessment results etc.*
- *The explanations are organized along a two-level description so they are difficult to find.*
- *There should be more detailed descriptions of methods, examples of use.*
- *I would like to select more than 3 verbs.*
- *The taxonomy now used and the categories lack "teamwork", "collaboration", which is in fact a very important skill to develop for the future labour market. In eLearning, many courses involve a form of communication and tasks, such as discussion boards with specific assignments. How would you assess such a learning with this taxonomy? Many of the categories are based in teacher-oriented approach where the assessment is based on remembering and reproducing what the teacher has showed or said to students.*

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Question 11: What features would you add?

- *Analysis of the LO as whole, more examples of assessment methods, at least basic reference to the subject area. Links to good examples of a certain assessment method... Formulate formative and summative assessment...*
- *suggestions for e-learning tools*
- *perhaps include some examples to better explain how to relate assessment methods to outcomes and implement them*
- *provide links from the explanations of the assessment types to the appropriate case studies, or provide brief examples/links to examples there.*

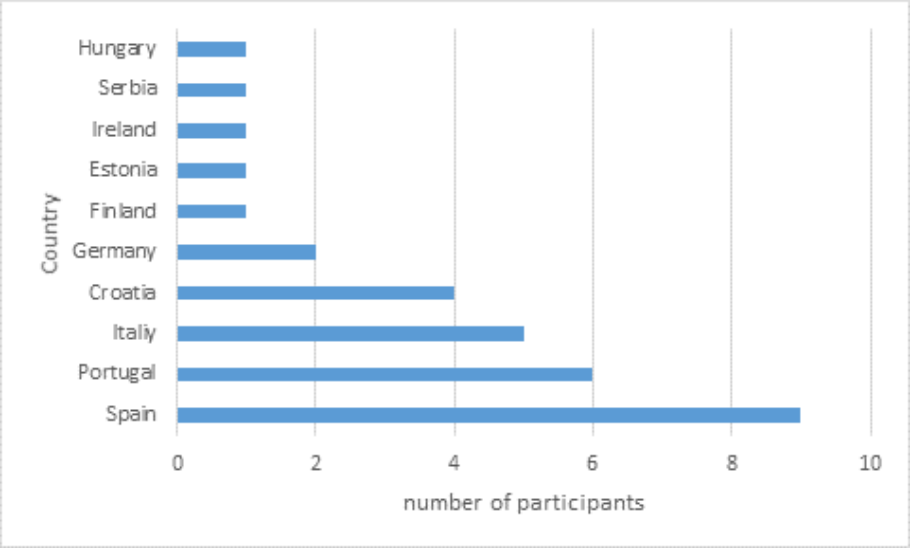
No participants in evaluation of the TALOE web tool replied that anything should be removed. Upon their feedback the TALOE web tool has been improved by adding examples of use, the detailed descriptions of learning outcomes and e-assessment methods with links to further reading resources.

Demographic questions:

Institution

The participants were dominantly from universities (87.09%), while others were from schools or institutes.

Country



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Conclusion

The Bologna process brought a need for a substantive change in a pedagogical model of teaching and learning in higher education, requiring improvement of the traditional ways of describing qualifications and qualification structures, modules and programmes. Focus moved on skills acquisition by students and not the mere accumulation of knowledge. The result is a shift from the content–based approach to an approach centred on the student, a change from teaching objectives to learning outcomes of the student. The learning outcomes are becoming fundamental for structuring the standards and guidelines of quality assessment in higher education and continuing education institutions in Europe and worldwide. In this context, the assessment of learning outcomes becomes a crucial process in the education system.

With information and communication technologies increasingly used in education, new opportunities for teaching, learning and assessment have been developed. Within the TALOE project a practical tool has been developed to promote the consistency between e-courses/modules and electronic forms of assessment. Aim of the tool was to help teachers/trainers of online courses to decide which e-assessment practices are adequate for their courses and if they are in alignment with defined learning outcomes. E-assessment is considered a critical part of e-learning in the same way assessment is critical to traditional learning.

The TALOE web tool has been developed by partners at the beginning of 2015. It was tested and improved according to the feedback and comments and is now ready for publication.

The tool consists of procedures that enable a person to check if the existing assessment methods in an existing course are in line with the stated learning outcomes and can help in making decisions on the most appropriate assessment method for a new course or module. The TALOE web tool also provides information about the learning outcomes, e-assessment methods and some case studies.

Key Reference Documents

- Anderson, L. W., Krathwohl, D. R. & Bloom, B. S. T. o. e. o. (2001). A taxonomy for learning, teaching, and assessing: a revision of Bloom's taxonomy of educational objectives (Complete ed. ed.). New York ; London: Longman.
- Bloom, B. S. (1956). Taxonomy of educational objectives; the classification of educational goals (1st ed.). New York: Longmans, Green.
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- Lõssenko, J. (coord.) (2014). TALOE e-assessment practices. Retrieved from http://taloe.up.pt/wp-content/uploads/2015/03/AnnexXI_WP3_01_E_Assessment_Practices.pdf

List of Appendices

Appendix 1: TALOE web tool evaluation form: https://docs.google.com/forms/d/1IiYhkdqTouBGtNyHP6_WH25mqkjrMpgteCRfpB8MFmk/viewform?c=0&w=1

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