

Comet competence grid entry tool

for creating digital competence grids

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Introduction

New pedagogical concepts focus on the development of competences related to certain fields of qualification. Whether used in an educational context in schools or businesses the gain of competence for a learner needs a structured support to help visualize and document ones' progress.

For processing competences the tool COMET (COMpetence-grid Entry Tool) was developed. With this tool competences and child-competences with different difficulty levels can be added and indicators/evidences that describe a gain of competence can be defined. Collaborative work on digital competence grids is also possible in the platform.

Internationally available the tool can be used at comet.edustandards.org

Functions:

- Structured compilation of competence fields
- Adding competences and child competences
- Linking learning materials and indicators/evidences to competences and child-competences
- Adding meta data
- Export-formats (XML, PDF, CSV)
- Thematic grouping of competence fields/grids
- Collaborative development of digital competence grids
- Search function for published competence grids
- Definition of relations (interdependence) of competences

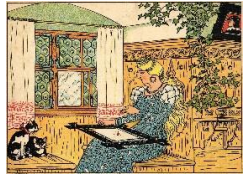
Digital competence grids

What are digital competence grids?

Every subject and topic, independent of educational level, can be layed out in a competence grid. Many organizations make use of this concept worldwide. Important aspects of a topic that learners should know are described verbally in a competence grid. Often competence fields are deducted from national curricula.

However, often it is only a one-dimensional description of competence fields. Going more into detail, competences can also be provided with a difficult level. This leads to a competence grid.

Let's take a quick look at this example¹:

Snow White	Remember	Understand	Apply	Analyze	Evaluate	Create
 <p>The tale of Snow White</p>	<p>What did Snow White find in the house of the Seven Dwarves?</p>	<p>Why did she take the poisoned apple?</p>	<p>If Snow White would come to your apartment or house: which items would she use?</p>	<p>Which events of the tale could happen in real life?</p>	<p>What would have happened if Snow White would have met Pippi Longstocking?</p>	<p>What is your opinion about the behavior of Snow White in this scene? Explain your view. <i>Snow White was now all alone in the great forest, and she did not know what to do. The trees seemed to whisper to each other, scaring Snow White who began to run. She ran over sharp stones and through thorns. She ran as far as her feet could carry her, and just as evening was about to fall she saw a little house and went inside in order to rest. Inside the house everything was small but tidy. There was a little table with a tidy, white tablecloth and seven little plates. Against the wall there were seven little beds, all in a row and covered with quilts. Because she was so hungry Snow White ate a few</i></p>

¹ Bloom's taxonomy is used in this case but any other difficulty level can be defined as well

						<i>vegetables and a little bread from each little plate and from each cup she drank a bit of milk. Afterward, because she was so tired, she lay down on one of the little beds and fell fast asleep.</i>
--	--	--	--	--	--	--

If competences are structured this way a matrix is the result which reflects an increasing difficulty degree from left to right.

This is then called a digital competence grid. Digital competence grids can be used for orientation and can be equipped with competences and child-competences (structured within a competence field).

In addition, indicators/evidences (e.g. tasks that are related to a competence) can be attached. Solving or providing these indicators/evidences show that a certain competence has been gained. With this approach competence grids can be developed with different difficulty levels and content (e.g. tasks, materials, weblinks) connected. This is the base of individualization processes for learning.

An example for determining an entry-level for a student into a competence grid could be a quiz-result. Students would then get tasks connected to a specific competence field depending on their initial results creating an adaptive learning scenario.

The COMET tool

To establish this individualization concept the tool was developed to help organize competences in a digital matrix and enhance them with meta data. It helps learning organizations to develop matrices that can even be grouped to reflect a thematic approach towards learning.

Contributing to a digital competence grid with indicators/evidences (e.g. quizzes, tasks, ...) can be done collaboratively. The major aim is a transparent visualization of competence fields to be gained within a subject or within an interdisciplinary context.

By developing and visualizing digital competence grids the following possibilities exist:

- Competency based visualization of topics or subjects
- Combination of different subjects to themes
- Individualization
- Development of individual learning plans
- Documentation of competences (also achievement oriented) if used in combination with a learning management system. An interface to MOODLE has been developed so far.
- Definition of relationships between competences
- Development of professional fields (professions) based upon competences
- ...

Framework and functionality

The Comet tool was developed by GTN Solutions² based upon the OpenSource Content Management System „Typo3³ “. Comet being an extension for Typo3 can also be considered as OpenSource and can be used by educational institutions free of charge to develop digital competence grids.

Registration and Login

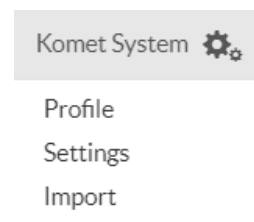
Once installed⁴ the registration of users and login can be done by mail from the main page. It is possible to use different authentication methods like:

- LemonLDAP
- Office365
- SAML

Profile

Every registered user has an individual profile that can be accessed and adjusted any time. If a digital competence grid should be published, all fields of the authors' profile have to be filled out.

Notice: all mandatory profile fields can be defined by an institution having individual installations of Comet.



Settings

Using the setting, various adjustments can be made related to educational standards of an organization

educational classifications, school levels, standards and taxonomies

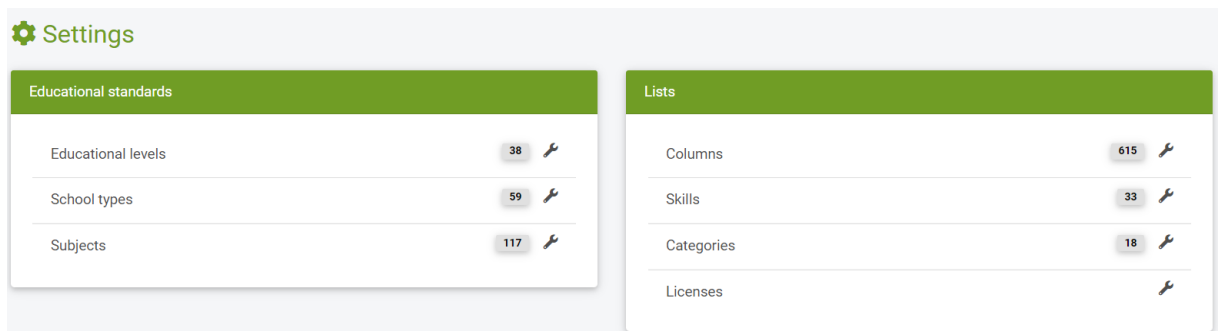
The Comet system is built very flexible. This way individual users using the system can define their own classifications.

After logging in using the settings symbol in the upper right corner these settings can be configured:

² GTN Solutions offers the configuration of the tool as a service as well as the interface development with other systems (e.g. Single-Signon).

³ Find more information on typo3.org

⁴ A copy of the comet tool is installed on comet.edustandards.org free to use



Educational level

The educational level relates to the school level that digital competence grids are used for. Using the educational level, the classification of the educational system can be made.

Type of school

Type of school is a sub-category of the educational level.

If the Comet tool is used in a larger context (e.g. not only a school class but for a whole educational institution) it is advisable to use a role system, where an administrator is in charge of the basic settings and definitions. Data is configured once and can then be used by all within the organization. Collaborative functions can be established (e.g. working together in developing a competence grid).

Difficulty levels/learning progress

The columns used for a digital competence grid can be defined and reflect the difficulty level of a competence column. Pre-defined columns relate to Bloom's taxonomy but can be configured to any other categorizational system as well (e.g. numbers).

Skills

Skills are used for languages. This relates to the definition of the Common European Framework of Reference for Languages (CEFR).

Category/standards relation

With these relations difficulty levels can be matched with either competences or tasks related to competences.

Licenses

If more persons contribute to a digital competence grid and upload/associate tasks and materials/evidence the licence used for these materials can be defined here. Different licenses can then be chosen when adding new resources. Licenses could be CC-BY-SA or similar.

Import

Using the import function, data can be imported from other Comet installations.

Notice for administrators: every Comet installation has a unique identification key which is part of each imported competence grid. By this a new import for updates is possible. Imported competence grids are kept marked with the origin on the target system.

During import of a competence grid all meta data (educational level, etc.) is imported as well.

Dashboard

On the dashboard all digital competence grids that are available to the user are shown. Also, in the right column meta data can be added for each competence grid.

On the main dashboard area the following categorization of competence grids is shown:

My competence grids: here all competence grids are displayed that the user has created using the button “new grid”.

Competence grid from: competence grids that have been published by the administrator are shown in this area.






Other grids: competence grids that have been published by other users of the installation are shown in this area.

Edit-mode for other grids: if access was granted to collaboratively work on specific grids they are listed here.

Sorting and educational level: if many grids are bookmarked or have been created it is possible to navigate them by using the drop-down menu “sorting by”. The educational level is a pre-selection for different school types contained within.

In the upper right corner of each competence grid different symbols indicate the status of each grid:



	Featured	Featured competence grids are available for the public. Users don't have to be logged in to access them.
	Shared to be edited by users	If more persons are assigned to a competence grid this status is shown.
	Automatic XML-Export	Competence grids that are marked for an automatic XML-export are automatically generated into a XML file that can be imported to learning platforms (e.g. MOODLE). <i>For this an additional configuration has to be made with the Typo3 planner (add task: „export published grids“) and a configuration in the MOODLE-cron and setting “xmlserverurl” (in the module exabis competencies, see: exabis series_admin-manual).</i>
	Published	Published competence grids can be found with the search function by other users. Copying (and editing) of a grid for individual purposes is possible.
	Grid related to a profession	Grid has a relation to a profession

Adding a new competence grid

Using the blue button on the dashboard „new grid“ the following form is called up:

Title *

New Competence Grid

Subject ?

Please select v +

Educational level * ?

Please select v +

School type * ?

Please select v +

Educational standard * ?

Please select v

Class ?

interdisciplinary grid ?

Description ?

In the title field the name of the grid is given. In the DropDown menu the grid is associated with the educational level and the school type.

The field „educational standard“ relates to whether the standard is for individual purposes, for an organization or a national standard.

If the fields are empty they can be defined in the profile settings.

The information file (e.g. a pdf-file) can contain information related to a competence grid, there is also a upload-field available for a thumbnail view of the competence grid.

After adding a new grid it can be accessed through the dashboard. By double clicking on the grid (or clicking on edit-mode in the right column) the grid can now be accessed and built. Using the plus-sign competence fields can be added now and competences can be defined.

Import of competences from a CSV-file: if competences are available in a csv-file (one competence per row), they can be imported into the grid.

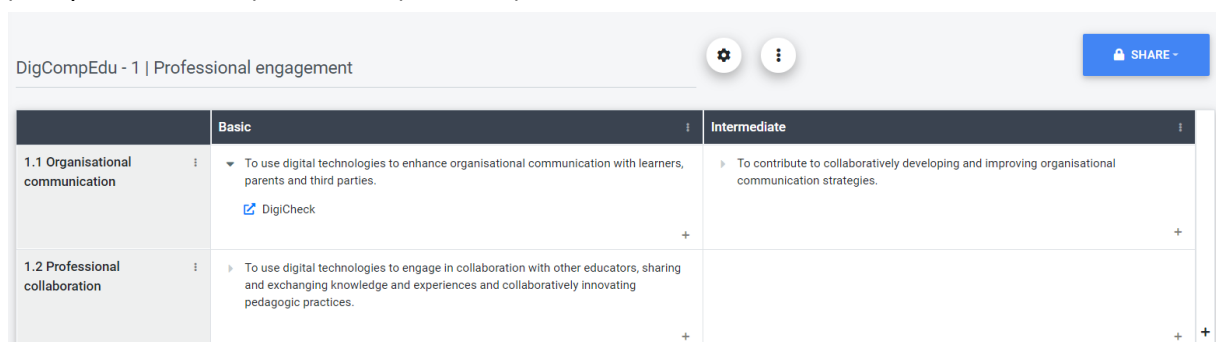
After creating a competence field additional competence fields and competences can be added using the rows and columns. Columns can be considered as difficulty levels.

The option „combine in row” allows to have competences assigned spanning several columns. This might be useful for certain overlapping competences in curricula.

Edit mode

Edit mode is accessed by double-clicking on a competence grid or clicking on the three dots in the right corner of a grid, then selecting “edit”.

In edit mode competences can be added in the cells that are in the crossover of rows (competence fields) and rows (columns).

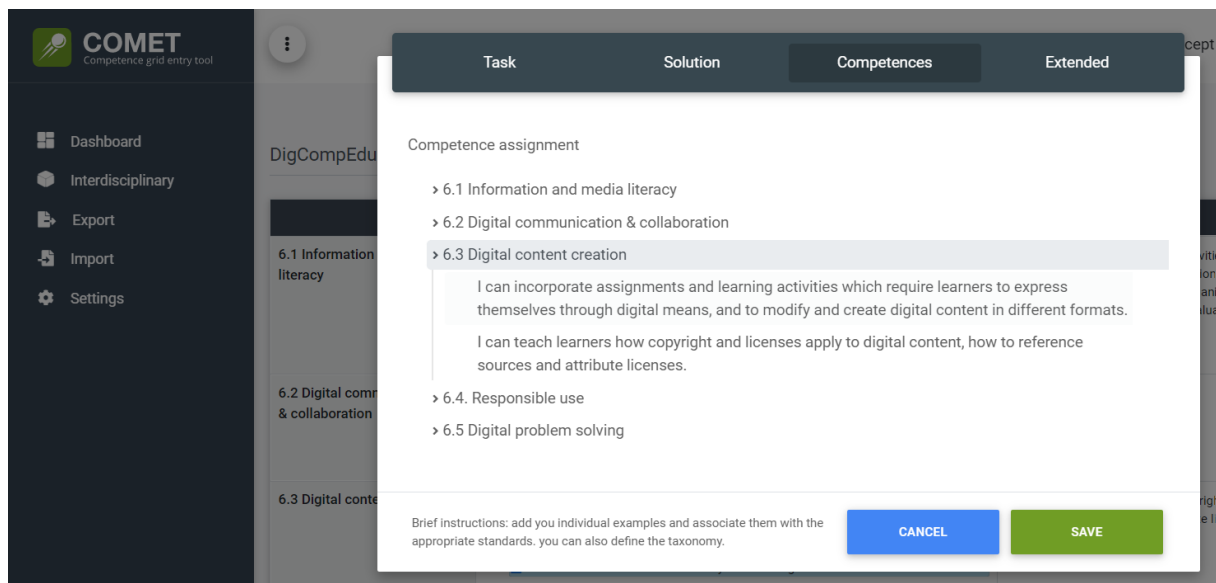


	Basic	Intermediate
1.1 Organisational communication	<p>To use digital technologies to enhance organisational communication with learners, parents and third parties.</p> <p>DigiCheck</p>	<p>To contribute to collaboratively developing and improving organisational communication strategies.</p>
1.2 Professional collaboration	<p>To use digital technologies to engage in collaboration with other educators, sharing and exchanging knowledge and experiences and collaboratively innovating pedagogic practices.</p>	

Indicators/evidences (e.g. materials or learning tasks) can be linked to competences. Child competences can be added to competences. Child competences can be accessed through the plus sign of a competence.

Child competences can also be equipped with materials and tasks.

Materials can be added by right-clicking on a competence “add material”. A form is called up that allows to describe the material/learning activity that is linked to the competence or child-competence. Learning materials can have a multiple assignment by choosing more than one competence in the list provided (in case more competences have been added to the column).



The tool allows to upload tasks/materials directly into the CMS. This should only be considered in individual installations of the tool. On comet.edustandards.org it is recommended to link resources to competences.

For information on how to download moodle activities in moodle and upload them in COMET, please see [Exabis Competencies documentation](#).

Notice for administrators: if there are access restrictions (e.g. secured by a login) to learning material external linking can still be considered. By linking tasks to competences resources are only called up after logging into the appropriate platform.

In case of working with MOODLE competence grids can be exported to a xml-format and imported to MOODLE. Additional resources can be uploaded to the competence grid within MOODLE.

Task
Solution
Competences
Extended

Name *

Excel Basics

Task ?
File upload
Browse

this task is a Moodle activity ?

or external link to the task ?

https://community.eeducation.at/course/view.php?id=836

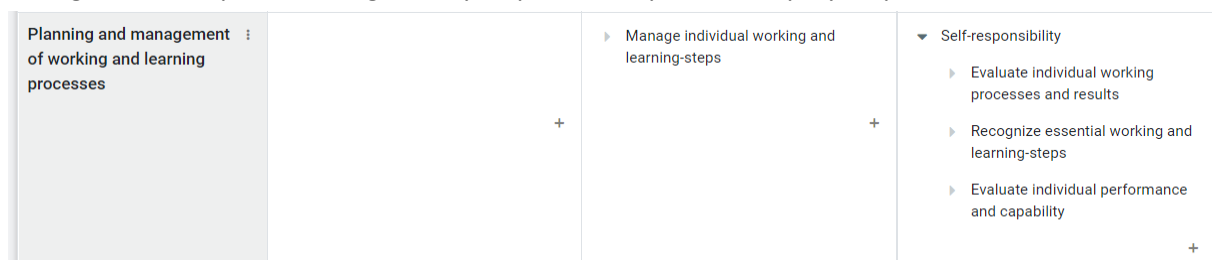
Description / Book reference ?

Additional meta data can be appended to a resource like: solutions, difficulty level, needed time for completion or didactical tips.

Child competences

It is also possible to add child competences to a competence cell. This principle has some advantages:

By using digital competence grids for learning processes in general it is possible to work more granular: depending on the level of performance of a student, additional materials can be provided through child competences to gradually acquire a competence step-by-step.



Example of a competence grid using child-competences. Learning materials can be added to both competences and child competences.

Using the app Dakora (which needs this structure) learning plans can be developed by the teacher and the student providing materials for each student individually in a weekly format. This can be considered as a key element for individualized learning scenarios. For more information regarding Dakora take a look at the documentation [exabis series teachers manual](#).

change course
course selected:
MoodleMoot Miami

interested student

pre-planning storage

new blocking element

MoodleMoot Miami: Effective communication skills

recycle bin

weekly schedule - MoodleMoot Miami

Monday 11th June 2018 - Friday 15th June 2018

start end

week day < today >

	Mo 11th06	Tu 12th06	We 13th06	Th 14th06	Fr 15th06
1. unit 07:45 - 08:35					
2. unit 08:40 - 09:30			MoodleMoot Miami: Principles of communication		
3. unit 09:45 - 10:35	MoodleMoot Miami: effective planning	MoodleMoot Miami: effective planning			

Meta data

Adding meta data to a competence grid is needed to classify it in an educational structure and find it. If a competence grid is selected in the dashboard several options for adding meta data are shown in the right column:

Description of each function:

Function	Description
Edit	Enter editing mode of a competence grid.
Publish/Draft	Publishes the selected grid or puts it into draft mode. When published, the grid can be found in the search box of the installation.
Automatic export to XML-Export	This automatically adds the grid to the export-option for synchronizing with a learning management system (like MOODLE).
Export selection to XML	Export the selection to the XML-format
Export to PDF	Export the selection to the PDF-format
Copy	Copies the selected grid to own dashboard. This enables editing of the grid.
Delete	Deletes the selected grid.
To my favorites	Bookmarks the selected grid for easier access.
Interdisciplinary subjects	This calls up the function to combine several competence grids (or parts of them) to an interdisciplinary theme where different aspects of an evidence/outcome are needed.
Profoundness view	The profoundness view focuses on the possibility to split up competences in basic and enhanced competences. If competences have been defined that way in the meta data, this view is generated.
Feature	This allows to publish a grid publically without having to log in to the platform (guest view).

Personal competences - Motivation to work and learn ✕

Title *

Personal competences - Motivation to work and learn

Subject ?

Please select ▼ +

Educational level * ?

Overall competencies ▼ +

School type * ?

Personal Competencies ▼ +

Educational standard * ?

National level ▼

Class ?

interdisciplinary grid ?

Description ?

The systematic classification of a grid in an educational context allows for a structured management and searchability within the platform.

Language

English ▼

Info File ? File upload Browse

Thumbnail ? ↓ social_competences_ad9cde88. Browse ⊘

Approved for editing by

+

created: 15. 03. 2021
edited: 15. 03. 2021

Author: ~~Andreas Riepl~~ ariepl.work@gmail.com

Change author name to

Change author email to

TRANSFER OWNERSHIP OF THE GRID ?

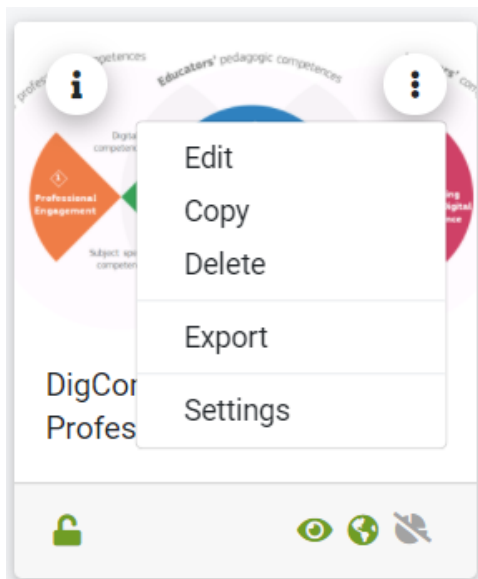
Additional information can be made available related to a grid in the meta data column. If a collaboration with other users is of interest users can be added here as well.

The author (or organization possessing the rights) of a competence grid needs to fill out the complete profile to be able to publish the grid.

If the (publishing-)rights of a grid should be transferred to a different user, this can also be done in the meta data column.

Search

Using the search tab all published grids can be found. If a competence grid is found it can be copied to an individual users' dashboard:



Copy: a copy of the grid is being made. All future changes to the grid by the original author will not be considered. All items in the grid become editable and can be adjusted to individual needs.

Copy for editing materials only: this function is used when a published grid is being used without the possibility to edit competences but being able to add individual material. This way a link to the published competence grid is established. Competences and child competences cannot be changed. If the original grid is changed this is also reflected in the grid copied this way. Learning materials can be added. Added material is not added to the original grid.

Notice: if a collaboration between users should take place the original author of the grid should add contributors to the grid using the meta data column of the grid.

Usecase: if an educational institution wants to distribute competence grids to several units (for example a local educational authority develops and provides a competence grid for several schools) this option will be used: the original grid cannot be changed (e.g. it might be directly derived from a state curriculum) however changes can be made by schools individually in the copy.

Interdisciplinary subjects (Themes)

The menu item „Interdisciplinary subjects” is used to combine different competence grids into one subject.

Interdisciplinary subjects can be subjects/topics that overspan other subjects (e.g. social and personal competences) or subjects/topics that combine aspects from different subjects (and therefore digital competence grids) into one theme. An example of such a theme could be “fairy tales” which would have a historical background (history competence grid) as well as a language background (language competence grid) as well.

Also, this concept can be used as an evidence that a learner has fulfilled different competences at once: if an associated task is solved properly and if competences are addressed from different

competence grids the evidence has been made that different interdisciplinary themes have been understood and solved by a learner.

This could be seen as the opposite direction of granular child competences.

Export

A selected grid can be exported to the XML-, CSV- or PDF-format. If a grid is exported to the XML-format it can be imported directly into MOODLE and can be used throughout the platform.

Precondition for this is to install the module exabis competencies

(https://moodle.org/plugins/block_exacomg) in the MOODLE-installation used.

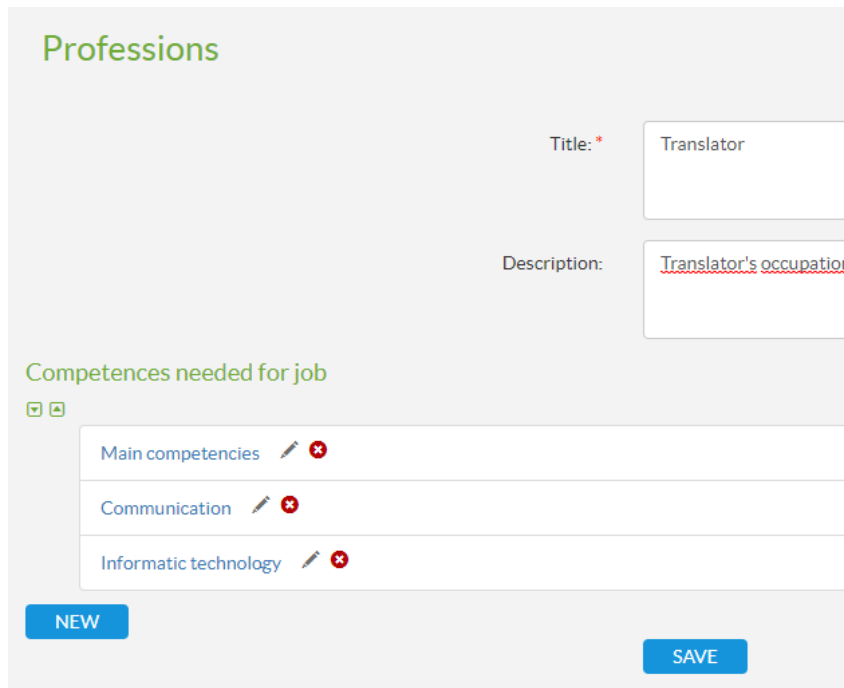
Notice: several grids can be exported to the XML-file at once. If files have been uploaded to the platform grids have to be exported one by one.

Relations

Relations are connections between competences. Relations can be defined for each competence. This can be done within a competence. The tab „relations“ lists the dependencies.

Dependencies between two competences can be one-sided or double-sided.

Professions

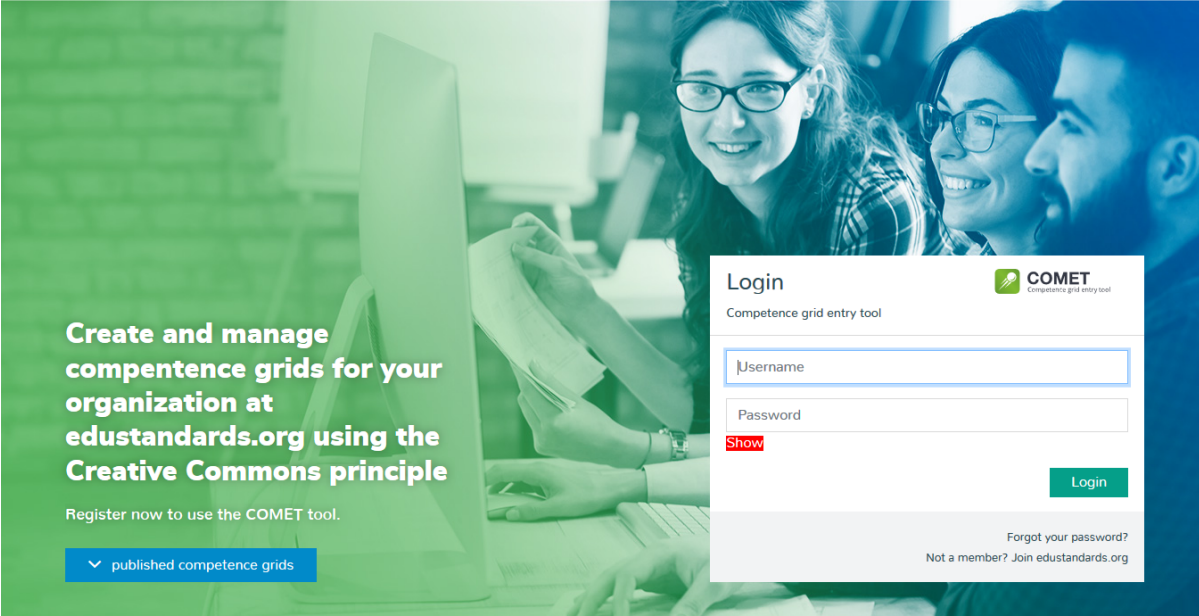


The screenshot shows a web form titled "Professions" with a light gray background. At the top left, the word "Professions" is written in green. Below this, there are two input fields: "Title: *" with the text "Translator" and "Description:" with the text "Translator's occupation" which is underlined in red. Below these fields, there is a section titled "Competences needed for job" in green, followed by a small icon of a grid. Underneath, there are three rows of competency labels: "Main competencies", "Communication", and "Informatic technology". Each label has a small pencil icon and a red 'x' icon to its right. At the bottom left of the form is a blue button labeled "NEW", and at the bottom right is a blue button labeled "SAVE".

Competence grids can be combined to professions. This way it is possible to present different aspects that a profession might include (e.g. a sales-person would need competences from business-related competence grids as well as language skills as well as social and personal competences).

comet.edustandards.org


The domain comet.edustandards.org hosts a public installation of the Comet tool. It has the same functionality as with individual installations and is free to use to create digital competence grids.



Create and manage competence grids for your organization at edustandards.org using the Creative Commons principle

Register now to use the COMET tool.

[published competence grids](#)

Login  COMET
Competence grid entry tool

Username

Password

Show

Login

[Forgot your password?](#)
[Not a member? Join edustandards.org](#)

Competence grids that are exported with this tool can be used for further modification within MOODLE.

1. Using digital competence grids with MOODLE

Important information: MOODLE has integrated a competence framework functionality in the past years. This concept follows a different focus and is at the moment not compatible with this version of competence grids.

For using this concept and the apps eLOVE and Dakora it is essential to have the modules of the exabis Series for MOODLE installed. Please follow this link:

<https://moodle.org/plugins/index.php?q=exabis> for the download versions or take a look at the [exabis-series teachers' manual](#).

Digital competence grids (XML-format) can be imported into the lms MOODLE using the plugins of the exabis-series. By combining competences with students' data it is possible to assess students on different levels of competences.

Especially with GDPR in place it is essential to be sensitive regarding the use of students' data. Data that stores assessments of students can be used as a guidance in the learning process as well as used to establish individualized learning scenarios. For this it is essential to have a system that is under control by the organization providing the platform. MOODLE being an OpenSource product, is the wide-spread choice for this in Europe.

The exabis series was especially developed for the documentation of the gain and visualization of competences of a learner and establishing a learner-driven scenario.

The modules consist of: exabis ePortfolio (this module stores eportfolio artefacts of students), exabis competencies (this module documents competences that have been worked on by students and assessments) and exabis student review (reporting tool that takes data from exabis competences and adds course-spanning interdisciplinary assessment possibilities in addition to working with digital competence grids).

The combination of these modules allows for a reporting based upon the learning development of students. These learning development reports can be a solid base for counselling and a structured overview on which steps to take next.

More information related to the exabis-series can be found in the [teachers'](#) as well as the [admins'](#) handbook.

In addition two apps were created for this concept: eLOVE (electronical Lifelong Outcomeoriented Vocational Education) as part of a KA2 Erasmus+ EU project (www.lovevet.eu) and Dakora (working with digital competence grids) which is developed together with the Federal Ministry of Education in Baden-Württemberg, Germany).

These apps offer a simplified interface for working with competences using webservice from MOODLE.

2. Individual installations of the Comet tool

Comet is OpenSource and therefore can be installed on individual installations.

If interested the source code can be obtained from GTN. It is essential to have a working Typo3 CMS installation to use the plugin.

If you need further support, please contact us at office@gtn-solutions.com.

2.1. Role- and rights concept

The backend administrator (of Typo3) can configure meta data groups. Within these groups all settings of a certain educational level are grouped.

There are two levels of rights:

- provider-admin: does the basic configuration and customization (e.g. adds data related to educational level and school types)
- editor: is part of a meta data group that works on specific competence grids and has the following privileges:
 - adding/editing/deleting grids
 - adding/editing/deleting competence fields
 - adding/editing/deleting competences
 - adding/editing/deleting child competences
 - adding/editing/deleting material/indicators/evidence

2.2. Settings

In the sysfolder FE groups the provider-admins are added, general settings are made and shares are managed.

General Access Settings

educationlevel

- with these values the general educational levels are defined

schooltype

- schooltypes within an educational level are added

niveau (taxonomy)

- all taxonomy levels are stored here

category

- taxonomies related to assessment and learning materials are added here

crosssubject (interdisciplinary)

- new (interdisciplinary) themes are stored here

gradingsystem

- assessment schemes are stored here (ABC, GME..)

alle


- privileges for all values above are stored in this group

Generate export-file for Moodle

- It is possible to generate a file in the export-section of the tool. Users that have the group MoodleXML can generate the file at any time
- On the Moodle-side there is a new link for the administrator in the exacomp-block to keep import up-to-date. By clicking on the link the data from comet is imported to Moodle. This can also be configured as a cron job.

It is advisable to host an individual Comet-installation when more competence grids and editors are involved.

Annex: explanation of competence grid layout

	PERFORMANCE INDICATORS—ELEMENTARY SCHOOL	taxonomy	PERFORMANCE INDICATORS—MIDDLE SCHOOL
1: INQUIRY  competence field	<ul style="list-style-type: none"> + 1A. Students make sense of the world around them through questioning. + 1B. Students analyze information to develop reasonable explanations that support inquiry. <ul style="list-style-type: none"> » a. Determine the validity and reliability of the document or information. » b. Revise explanations as necessary based on personal reflection, peer critique, and/or expert opinion. » c. Explain the relevance of their findings. » d. Propose solutions to problems and ask other questions. + 1C. Students communicate in ways that foster the exchange of ideas in a democratic society. 	competence child competence	<ul style="list-style-type: none"> + 1B. Students analyze information to develop reasonable explanations that support inquiry. + 1C. Students communicate in ways that foster the exchange of ideas in a democratic society. <ul style="list-style-type: none"> » a. Solicit and respond to feedback. <ul style="list-style-type: none"> How to give feedback » b. Identify possibilities for continued or further research. » c. After examining issues from more than one perspective, define and defend the rights and needs of others in the community, nation, and world.
2: HISTORY	<ul style="list-style-type: none"> > a. Explain differences between historic and present day objects and identify how the use of the object may have changed over time. > b. Identify and use various sources for reconstructing the past, such as documents, letters, diaries, maps, textbooks, photos, and others. > c. Differentiate among fact, opinion, and interpretation. > d. Make predictions and/or decisions based on an understanding of the past and the present. > e. Identify an important event in the local community and/or Vermont, and describe a cause and an effect of that event. > f. Examine how communities throughout time have promoted human rights and explain the importance to present-day life. 		<ul style="list-style-type: none"> > a. Describe how life in the United States and/or the world has both changed and stayed the same over time; explain why these changes have occurred. > b. Identify different types of primary and secondary sources. > c. Evaluate the credibility of differing accounts of the same event(s). > d. Identify how technology can lead to a different interpretation of history. > e. Make predictions and/or decisions based on an understanding of the past and the present. > f. Identify important events in the United States and/or world, and describe multiple causes and effects of those events. > g. Analyze a current or historic issue related to human rights, and explain how the values of the time or place influenced the issue.