



**ECHOES: Extended Classrooms for Higher Opportunities Enhancing Skills**

**R1.A2.2 - NATIONAL RESEARCH  
R1.A3.1 – NATIONAL REPORT  
AUSTRIA**



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## 1. Methodological premise

This document is configured as the logical union of the two deliverables provided for R1.A2.2 - NATIONAL RESEARCH and R1.A3.1 - NATIONAL REPORT. The two deliverables are closely related and the entire development methodology saw the simultaneous construction of the document taking into account the common factors useful for a complete and coherent understanding of the phenomenon analyzed in the various national frameworks.

The DESK analysis (R1.A2.2 - NATIONAL RESEARCH) saw the investigation of the phenomenon from the point of view of the national strategic framework, the adoption of typical national policies and the most used instruments at national level. The second part of document R1.A3.1 – NATIONAL REPORT instead saw the analysis of the national state through the questionnaires and focus groups developed during the project phases (see deliverables A2.3 SURVEY and A2.4 ONLINE TRANSNATIONAL FOCUS GROUPS ). All the aggregated data and considerations have led to the development of this deliverable.

## R1.A2.2 - NATIONAL RESEARCH

### 2. Desk research - State of the art and development of online / distance learning in Austria

#### 2.1 National and regional diffusion of online / remote training and the main areas of application

Based on the desk research there is no online / remote training for students below bachelor's degree level.

At the university level (bachelor and master degree) there are 44 universities that offers online/remote studies. These universities offer in total 163 study programmes in different fields. Most of them are not 100% online training. Instead, these study programmes use blended learning as their main method.<sup>1</sup>

#### 2.2 The most used platforms

#### 2.3 Learning platforms

A learning platform is a software-based learning environment with the aim of providing teaching content as well as structuring the learning process and ensuring communication between teachers and learners. Various functions are combined in a software package that organizes the interaction between teachers and students.

The learning platforms are offered as software apps for installation on the users' devices. Access via web browser has been established for all common systems. This makes learning largely independent of the hardware used to access the platform and allows learning to be flexible and independent of time and location.

There is a various number of LMS systems available on the market. In the following, a selection of learning platforms will be discussed in more detail. These examples are the main systems used in school and university vocational training in Austria. This does not restrict the use of these systems in any way to their use in business enterprises. In chapter zero, a learning platform is presented which is used by an aviation company

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<sup>1</sup> [Fernstudium in Österreich: Alle Infos, Unis, FHs | Studieren.at](#)

for further training of its employees. This platform is intended to be a representative example of an LMS system that is used in the business world for the training and continuing education of employees.

The functionalities of the individual learning platforms described in this chapter refer to the tools most important and most frequently used in teaching. The following description does not claim to be a complete description of all functionalities. A comprehensive description of the functions can be found in the respective manufacturer's manual. These can be accessed via the webpages of the developers.

## Microsoft Teams

MS Teams is designed as software to support collaboration within an organization and is therefore not an LMS system in the classic sense. However, it fulfills most of the functionalities of an LMS platform and has been used successfully in teaching for several years at the HTL-Wolfsberg, for example.

The basic idea of Microsoft Teams is to group the individual members of a work group (e.g. a school class) into a team. As a teacher, you can provide the individual teams with information and learning materials centrally, contact the members in various ways, and carry out tasks to check learning objectives. Subsequently, you can give the learners individual feedback on their performances. It also allows team members to work together on a task and share the results directly with the other participants. A big advantage is that you can get in direct contact with the learners in a meeting.

Microsoft Teams offers a wide range of functions to handle these tasks. The main ones are described below.

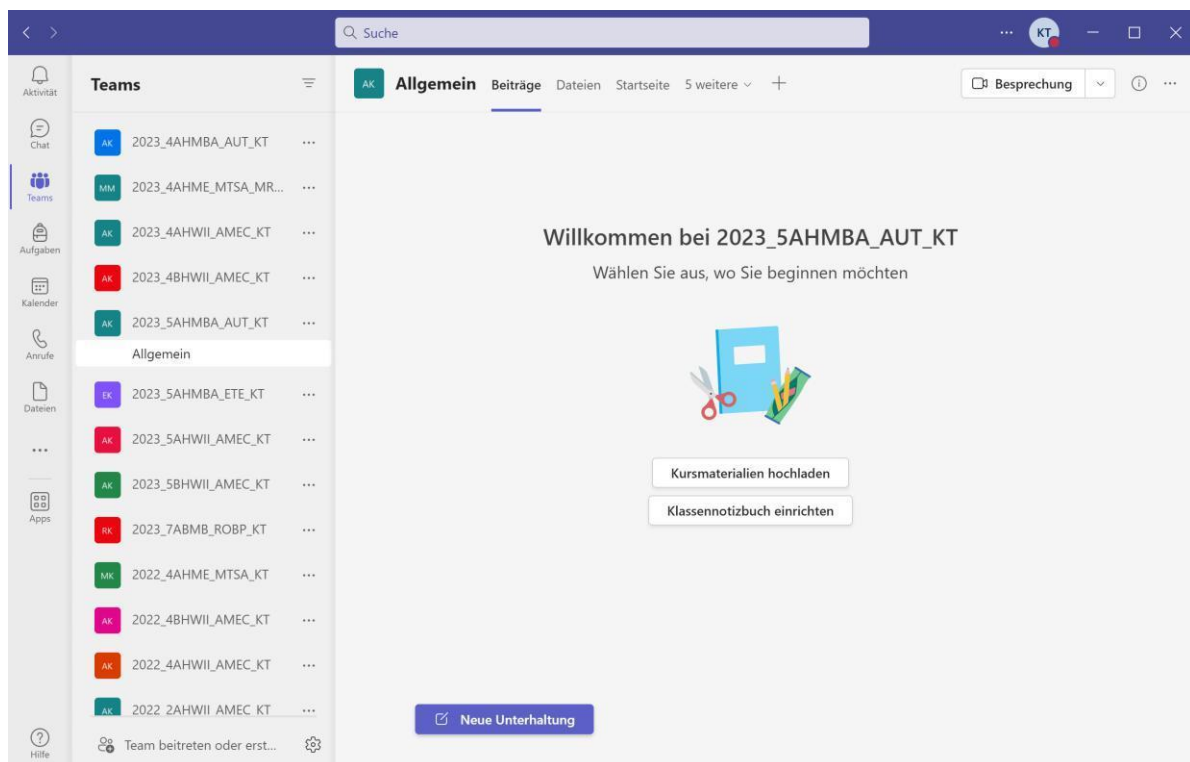


Figure 1: Screenshot MS Teams at the HTL Wolfsberg

MS Teams is integrated into the Microsoft 365 Suite and can be accessed directly by all other products in this package. For example, it is possible to provide content to team members directly from the cloud storage app Microsoft OneDrive. Another advantage is that the products of the Office 365 Suite are widely used and well-known. This makes MS Teams intuitive to use.

The Microsoft 365 Suite software package is available free of charge to educational institutions.

The Microsoft Teams app can be installed on personal computers of teachers and students. It is available for all common operating systems. It is possible to access the app directly via web browsers, but there is also an app available for mobile devices. This facilitates the use of MS Teams in face-to-face classes when not every learner has a personal computer available.

## **Functions**

### **Team**

The central element of MS Teams are teams, in which learners are grouped together to form interest groups. The participants are added to the team by the team creator (owner). On the main page one is provided with the latest information. On that page there is also the possibility to send a chat message to all team members and thus have a group chat with all participants.

### Course-materials:

To provide participants with course materials, files can be uploaded. To store this content in a structured way, the folder structure known from Microsoft Windows is available. The team owner additionally has the possibility to adjust the access rights for the uploaded files.

### Class-Notebook:

The notebook is a tool available in the Team category. It is based on the notebook function One Note from Microsoft and can be used by all team members. A distinction is made between student notebooks, which can only be used and viewed by the respective students, and public notebooks, which are edited by the entire learning group. Texts, images, handwritten notes, attachments, videos or voice recordings can be stored in this location.



### Tasks:

There is also a category which allows to assign tasks. It is an indispensable tool to provide students with tasks and to control the learning progress. A task can be uploaded as a text entry, but also as a file attachment. Deadline management can be used to specify the due date. The assessment can be done by assigning points. After the teacher has checked the task, it is returned to the learners with the number of points achieved, as well as feedback. Via the rubric grades, the achieved points of all tasks, and thus the learning progress can be checked.

### **Meeting**

This function enables the teachers or team members to communicate with each other in a video conference and to get into direct contact with each other. At this point, MS Teams differs from most other learning platforms as they do not provide a meeting function in this form.

Meetings can be organized and coordinated via the appointment calendar. Once a meeting has started, the participants are directly connected via audio and video. Each participant can transmit the content of his or her screen. Thus, a lesson like face-to-face teaching can be realized. Furthermore, the processing status of tasks can be viewed directly by the students transmitting their screen to the teachers.

All the usual functions such as chat, reactions, data transfer, screen transmission, etc. are available. If learners are to solve a task in small groups, they can be released to group rooms for a specified period of time.

It should be noted at this point that this function is very well suited for combining face-to-face teaching with distance learning. Experience has shown that lessons with divided groups (on-site or externally connected) can also function in this way.

### **Calendar**

The calendar function allows to schedule meetings with members of the team or even external participants. The calendar function is linked to Microsoft 365 products. Entries made in MS Teams therefore also appear in the calendar function under Microsoft Outlook.

## Chat and calls

This function offers the possibility of getting into contact directly with people of the organization. Depending on the appointment calendar as well as the login status, a presence status is generated, which represents the availability to the other participants. A chat message can be sent for short inquiries. A personal conversation can be made via an audio call. Both functions are available with one conversation partner as well as a group chat or conference call.

## Basic data

<b>Manufacturer:</b>	Microsoft
<b>Homepage:</b>	<a href="https://teams.microsoft.com/">https://teams.microsoft.com/</a>
<b>Licensing:</b>	Office 365 license, free for educational institutions
<b>Users:</b>	MS Teams is one of the most widely used collaboration software in the world and is used by countless companies for team member collaboration. The number of daily active users is reported to be 145 million users. <sup>2</sup>
	It is also used in teaching at more than 270,000 educational institutions worldwide. <sup>3</sup>

<sup>2</sup> Statista: Zugriff am 19.10.2022, 16:10 Uhr, <https://de.statista.com/statistik/daten/studie/1189929/umfrage/anzahl-der-taeglich-aktiven-nutzer-von-microsoft-teams-weltweit/>

<sup>3</sup> Microsoft: Zugriff am 19.10.2022, 16:20 Uhr, , <https://www.microsoft.com/de-at/microsoft-teams/education>

## Moodle learning platform

The learning platform Moodle is a General Public License application, which is widely used in Austria in the field of vocational education, especially in higher vocational schools and universities. The free use and the simple and clear structure as well as the essential functions contribute to the popularity of this tool.

After registration on the platform, one has access to the courses offered by the respective organization. The organization can provide a customized start page. This start page provides access to the courses offered by the organization. Through a self-enrollment, learners can participate in the course. For this enrollment, an enrollment key (password) may be required, which is provided by the course instructor.

A dashboard provides an overview of the courses currently attended, recently used functions and much more. The schedule provides an overview of upcoming course units as well as assignment deadlines. The dashboard can be configured according to the users' own preferences.

The screenshot displays the Moodle dashboard interface. At the top, the header includes the Moodle logo and the text 'Moodle Lernplattform Pädagogische Hochschule Kärnten'. The user's name 'Thomas Kreuzer - TK' is visible in the top right corner. Below the header, there is a navigation bar with options like 'Startseite', 'Dashboard', 'Meine Kurse', 'Moodle Infos', 'eTools', 'Quicklinks', and 'Deutsch (de)'. The main content area is divided into several sections:

- Navigation:** A sidebar menu on the left with options like 'Startseite', 'Dashboard', 'Webseite', and 'Meine Kurse'.
- Kalender:** A central calendar for November 2022, showing dates from 1 to 30. Below the calendar, there are options for 'Vollständiger Kalender' and 'Import und Export'.
- Zuletzt genutzte Objekte:** A list of recently used objects on the right side, including 'ANONYME RÜCKMELDUNGEN ZUR LV', 'ABGABE HANDOUT FÜR DIE LEHRVERA...', 'ABGABE DER TEILNAHMEBESTÄTIGUNG...', 'ABGABE UNTERRICHTSPLANUNG, UNTE...', 'E-LEARNING INFOS', 'SWAY-PRÄSENTATION (EVALUATION) F...', 'UNTERRICHTSMETHODEN', 'INFORMATIONEN ZU DEN LEHRVERANS...', and 'ANKÜNDIGUNGEN'.
- Personen online:** A section on the left showing the number of people online (8 Personen online) and a list of names like 'TK Thomas Kreuzer', 'MB Monika Raffelsberger-Raup', 'Bj Bettine Jochum', 'Barbara Kogler', and 'Gerda Kysela-Schleier'.
- Zeitleiste:** A bottom section with a play button icon and a red arrow icon.

At the bottom of the screenshot, there is a caption: *Figure 2: Screenshot Moodle - Dashboard at PH Carinthia<sup>4</sup>*

<sup>4</sup> PH Kärnten: Zugriff am 16.10.2022, 14:20 Uhr, <https://moodle.ph-kaernten.ac.at/>

Moodle does not include communication software to engage directly with learners. If the Moodle course is intended to feature integrated learning, i.e. combining live training and online training remotely, an additional communication platform such as Zoom or MS Teams is required.

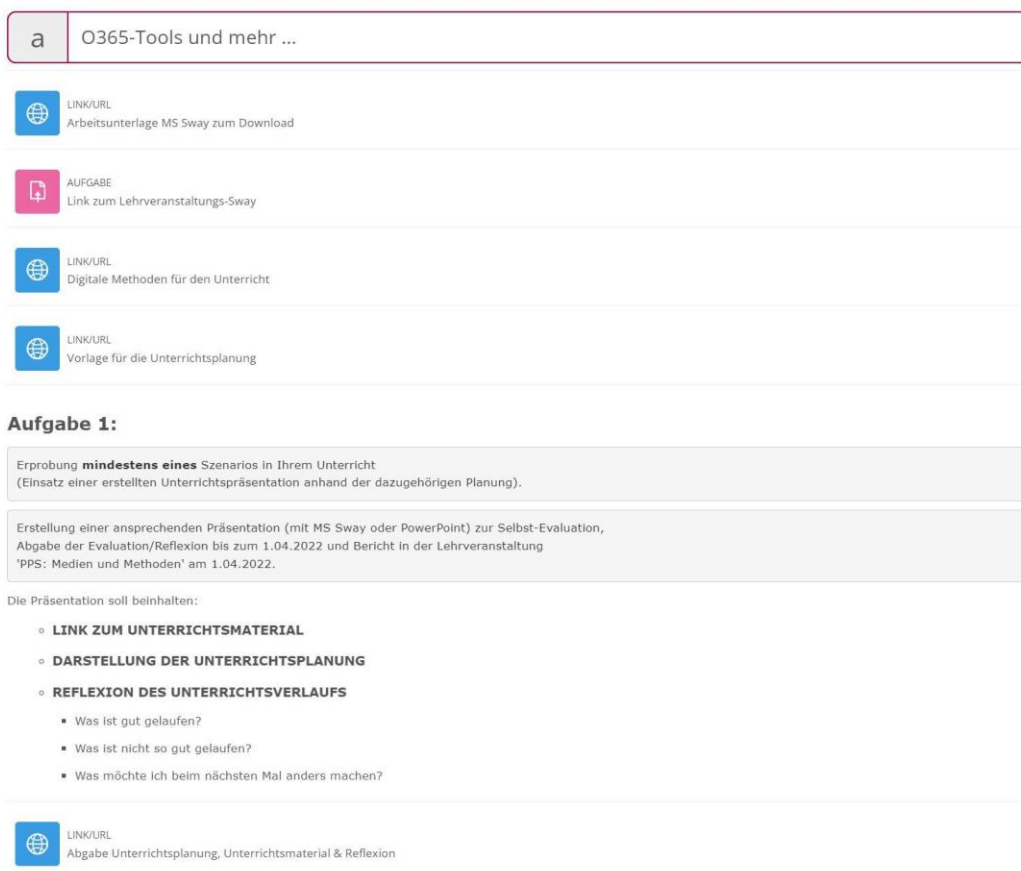
## **Functions**

As described above, courses on specific topics can be offered in Moodle. The options for designing a course will be discussed in more detail below.

On the start page one has access to the courses one has enrolled in. The content for each individual course is summarized on a course page and can be subdivided and structured into individual chapters using headings.

This course content can be unlocked step by step during the lecture. If the course is conducted as integrated learning, the subject areas can be released for the learners depending on the progress of the learning event. In the case of distance learning courses, it is also possible to unlock further packages within a given period of time, a week for example.

## Lehrveranstaltungsinhalte



The screenshot shows a Moodle course page titled 'Lehrveranstaltungsinhalte'. At the top, there is a search bar containing the text 'a O365-Tools und mehr ...'. Below the search bar, there are four items listed, each with a globe icon and the text 'LINK/URL':

- Arbeitsunterlage MS Sway zum Download
- AUFGABE: Link zum Lehrveranstaltungs-Sway
- Digitale Methoden für den Unterricht
- Vorlage für die Unterrichtsplanung

Below these items, there is a section titled 'Aufgabe 1:'. The task description reads: 'Erprobung **mindestens eines** Szenarios in Ihrem Unterricht (Einsatz einer erstellten Unterrichtspräsentation anhand der dazugehörigen Planung).'

Below the task description, there is a text box with the following instructions: 'Erstellung einer ansprechenden Präsentation (mit MS Sway oder PowerPoint) zur Selbst-Evaluation, Abgabe der Evaluation/Reflexion bis zum 1.04.2022 und Bericht in der Lehrveranstaltung 'PPS: Medien und Methoden' am 1.04.2022.'

Below the text box, there is a section titled 'Die Präsentation soll beinhalten:' followed by a list of requirements:

- **LINK ZUM UNTERRICHTSMATERIAL**
- **DARSTELLUNG DER UNTERRICHTSPLANUNG**
- **REFLEXION DES UNTERRICHTSVERLAUFS**
  - Was ist gut gelaufen?
  - Was ist nicht so gut gelaufen?
  - Was möchte ich beim nächsten Mal anders machen?

At the bottom of the screenshot, there is another 'LINK/URL' item: 'Abgabe Unterrichtsplanung, Unterrichtsmaterial & Reflexion'.

Figure 3: Screenshot Moodle - Course Media and Methods at PH Carinthia<sup>5</sup>

A variety of functions are available for the individual elements in the course.

### Information material

Learning material can be embedded via a link/URL to external destinations. This can be a website, presentations like in MS Sway, PDF documents, Office documents and a lot more. Information can also be specified as text modules directly on the course page.

### Tasks

The learners can be given a task via the rubric Tasks, which they must solve on their own and submit to the course instructor. The task can be provided as a link to an external text or file, but also as an internal text module.

<sup>5</sup> PH Kärnten: Zugriff am 16.10.2022, 15:00 Uhr, <https://moodle.ph-kaernten.ac.at/course/view.php?id=2597&section=6>

After solving the task before the given deadline, it is uploaded by the participants as a file attachment. Comments can be added in a text field for the submission. Before the deadline, changes can be made to the submitted solution. These are documented in the change status.

The instructor can post an assessment and comments via the assessment status. In addition to that, an overview of all open tasks with due dates are shown in the dashboard.

### **Forum**

A discussion forum provides the opportunity for participants to interact with each other on course-specific topics. Everyone can open a new topic or provide input on existing topics. Of course, instructors can also participate in the discussion.

This tool can also be used to submit assignments with certain restrictions. The big advantage is that the students have access to the submission of the other participants.

### **Presence**

This function can be used to record the attendance of participants in distance learning courses. An entry is made by the students themselves and is only possible by means of a password, which is issued by the lecturer during the lecture.

### **Course Evaluation**

An easy way to conduct an evaluation at the end of a course is offered by MS Forms. The creation of such a survey is described in chapter 2.1.2. The survey created can be integrated into the Moodle course via a link.

### **Basic data**

<b>Developers:</b>	Martin Dougiamas and many other developers
<b>Homepage:</b>	<a href="https://moodle.org/">https://moodle.org/</a>
<b>License</b>	GNU (General Public License)
<b>Users:</b>	345 million users, 43 million courses in 244 countries <sup>6</sup>

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<sup>6</sup> Vgl. Moodle: Zugriff am 9.11.2022, 18.50Uhr, <https://stats.moodle.org/>

## iMooX

Digital courses, so-called MOOCs, are made available to learners via the iMooX learning platform. The course is accessed via a web browser. Out of that reason it is largely hardware-independent and easily accessible. Participation is independent of time and place and can be done by the participants at their own pace. After a free registration, access to a wide range of digital courses is provided by Austrian educational institutions.

### GOAL:

Learners independently develop the content of the course. A final learning objective check reveals areas with knowledge gaps. These must be closed independently by repeating the relevant passages.

### COURSE:

The course is divided into several lessons. The start date is set by the instructor. From this point on, the first lesson is unlocked for the participants and can be worked on. In general, the activation of the individual lessons is synchronized. For example, a new part can be unlocked every week. In this way, the learning process is staggered, similar to face-to-face lessons at a educational institutions. At the end of each lesson, a learning objective test must be completed. If all individual learning objectives are achieved, the course is positively completed, and a certificate is issued.

Figure 4: Screenshot iMooX<sup>7</sup>

<sup>7</sup> iMooX: Zugriff am 13.10.2022, 12:40 Uhr, <https://imoox.at/mooc/course/view.php?id=246>

## Functions

The course to be completed is made available by the corresponding educational institution on the iMooX platform. There it can be accessed via the search function or via a link provided. In order to participate in the course, one must enroll in the selected course.

## Lessons

The course is divided into lessons, which must be worked on in a staggered manner. In the individual lessons, the teaching content is made available digitally. Participants watch videos, presentations, or work with provided literature.

The conduction of tasks within a section or lesson can be acknowledged by the participant by clicking on a checkbox. The learning progress can be displayed graphically in a bar chart in the course overview.

At the end of each lesson, a learning objective test is to be completed. This is done in the form of a multiple-choice quiz. For a positive completion of the quiz, all questions must be answered correctly. A certain number of attempts are available for this.

If you find that you still need to catch up in a certain area after an attempt, you can navigate back to the course content at any time and deepen your knowledge there. The course content can be retrieved at any time, you can scroll up and down in the course and repeat content as needed and consume multiple times.

## Media

Various media are integrated into the individual lessons to present the subject matter. The main focus is on learning videos created by the instructor to convey the theoretical input. These videos are embedded in the course in the individual lessons.

Complementary to these learning videos, mandatory literature as well as supplementary literature can be added by the course creator. These are embedded in the form of PDF's, which can be opened or downloaded from the course page.

## Forum



The forum integrated into the course provides the appropriate place for discussions with fellow learners. The instructor also can also actively participate in the discussions if needed.

### **Certificate**

As a prerequisite for positive completion of the online course, the quizzes of the individual lessons must be completed positively. If this is fulfilled, a certificate of positive participation will be issued to the individual participant. This certificate can then be sent to the teacher, who can record a positive completion of the course, for example.

### **Evaluation**

Graduates of a course can rate it after completion with a maximum score of five stars. This rating is intended to serve as an indication of the qualitative structure for future participants.

### **Basic data**

**Developer:** Graz University of Technology

**Homepage:** [www.imoox.at](http://www.imoox.at)

**Licensing:** Open licensed courses

**Users:** 78,276 learners, 48 partners <sup>8</sup>

The iMooX learning platform is used by universities, ministries, other educational institutions, to convey digital teaching content.

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8 <sup>8</sup> IMooX: accessed 10/14/2022, 1:40 PM, <https://imoox.at/page/about>

## LMS - Learning with system

The abbreviation LMS.at stands for “learning with system” and provides solutions for educational challenges. LMS has been a fixed component of the Austrian educational landscape for years and can be used by Austrian federal schools free of charge.

LMS.at supports individualized learning and teaching in everyday school life. It enables competence-oriented teaching and transparent performance documentation, simplifies lesson management and lesson documentation. LMS.at provides modern, interactive teaching materials, promotes self-organized learning, facilitates team teaching, and supports networking and communication with parents in conformity with data privacy laws. All functions are directly integrated into the platform and can efficiently be used by teachers and students. After registration, LMS.at courses can be accessed immediately.<sup>9</sup>

The screenshot shows the LMS.at user interface. On the left is a navigation menu with options like 'Startseite', 'Favoriten', 'Angebote', 'Mein LMS', 'Kursverwaltung', 'Mittellungen', 'Bibliothek', 'Kalender', 'Lernplaner', and 'Abmelden'. The main content area is titled 'Startseite' and contains several widgets: 'Beurteilung' (no entries), 'Aufgaben' (no tasks), 'digitalschool - Meine digitalen Schulbücher' (with a 'DIGI4SCHOOL' logo and a link to connect accounts), 'Diskussionen' (with a sub-section 'Meine Diskussionen' listing 'LMS4Teachers - Informationen für Lehrer/innen'), and 'Aktuelles'. On the right, there are sections for 'Mitgliedschaften', 'Kurse / Lernräume' (with links to 'FIT4LMS - Informationsportal', 'Schulen/Bildungsgemeinschaften', 'Fachbereiche', and 'LMS4Teachers'), 'Mittellungen', and 'Kalender'. The calendar shows a list view with columns for 'Datum', 'Zeit', and 'Bezeichnung', listing events like 'Landesfeiertag Burgenland' and 'eLecture: LMS.at in der Digitalen Grundbildung'.

Figure 5: Screenshot user interface LMS.at<sup>10</sup>

## Functions

After free registration, a variety of functions are available. The most important functions are briefly described below.

<sup>9</sup> BMBWF: Zugriff am 10.11.2022, 16:40 Uhr, <https://www.bmbwf.gv.at/Themen/schule/zrp/dibi/itinf/itdienstleistungen.html>

<sup>10</sup> LMS: Zugriff am 10.11.2022, 17:10 Uhr, <https://lms.at/dotlrn/>

## **Course Management**

New courses (single-column or double-column) can be created here. Courses can only be created by persons who have been assigned the roles of teachers. The roles are assigned by the schools' LMS administrators. It is also possible to use ready-made templates for the respective school subjects. When creating a new course, some characteristics such as school year, subject, class name, class abbreviation or name of the school must be defined. Once the course is created, members must be added to the course. This can be done manually or by reverting to an existing course.

## **Library**

In the courses created the tab Library can be found. The library offers a variety of possibilities to provide the learners with documents in any form (documents, images, videos, links, audio files, animations...) in the respective course. There is also the possibility to access a variety of already existing libraries. In addition, the library offers the possibility of a link to MS Teams. For example, it is possible to access a class notebook in MS Teams directly from an LMS course.

## **Tasks**

In the Tasks section of a course, tasks can be assigned to learners. It is possible to choose the date when the task will be made available. It is also possible to assign points for the tasks created. The assignment of points can subsequently be subdivided into assessment criteria. Additional documents can be added to the tasks for a better understanding. Another useful function in the tab Tasks is the attachment of sample solutions. These are only released after the deadline of the task. Additional subtasks can be added to each task as well.

## **Assessment**

The open and completed tasks can be viewed in the Assessments area. The points awarded are displayed there in a clear form. The degree of completion of the tasks is also displayed as a percentage.

## Communications

In this section it is possible to send messages (e-mails) to the learners in the already created course. It is possible to request a read-confirmation. It is also possible to select whether the learners can reply to the message or not. Besides that, all sent and received messages are visible on the main dashboard.

## Basic data

**Developer:**

**Homepage:** <https://lms.at/>

**Users:** 500,000 students and teachers <sup>11</sup>

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<sup>11</sup> Education: Zugriff am 10.11.2022, 17:00 Uhr, <https://education.at/ressourcen/lmsa>

## Ninja for Business

In the questionnaire provided by t2i the learning management system "Ninja for Business" is mentioned. This system is little known and not represented in Austria. The homepage, cf. Figure 6, is neither available in English nor in any other language. Likewise, looking for a distribution partner of Ninja for Business in Austria did not yield any result.

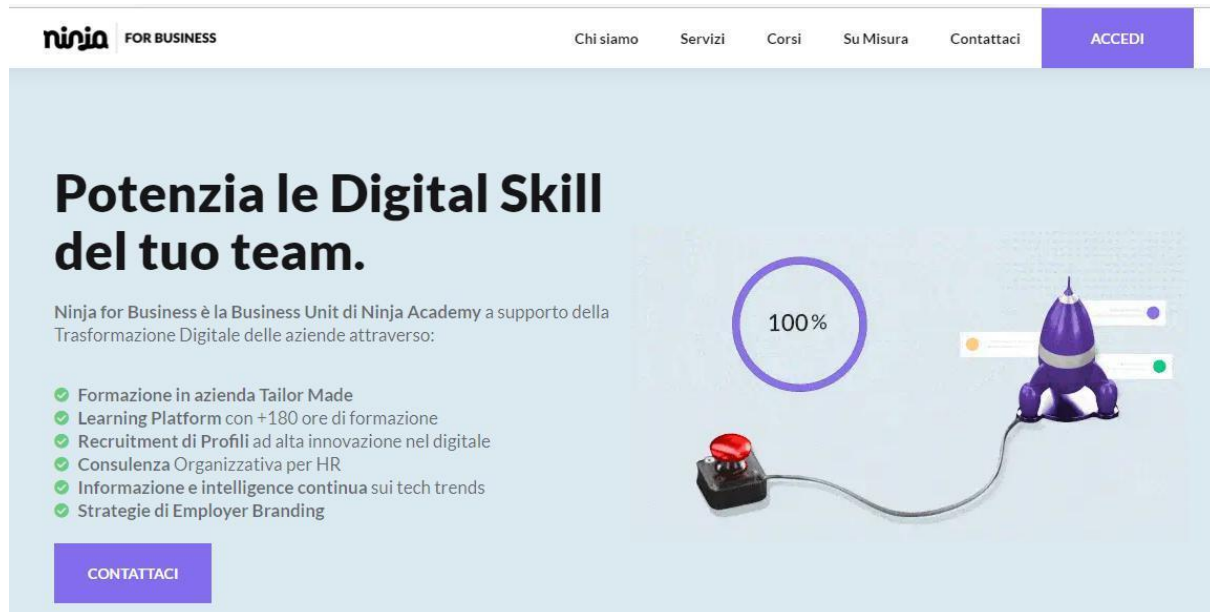


Figure 6: Screenshot Homepage Ninja for Business

## Functions

The functions are not described in this report, because they are only available in Italian.

## Basic data

<b>Developer:</b>	Ninja Marketing
<b>Homepage:</b>	<a href="https://forbusiness.ninja.it/">https://forbusiness.ninja.it/</a>
<b>Licensing:</b>	individual
<b>Users:</b>	> 100.000 <sup>12</sup>

<sup>12</sup> Ninja for Business: Accessed 11/4/2022, 1:50PM, <https://forbusiness.ninja.it/>

## ILIAS

The beginning of this learning management software was a project at the University of Cologne in 1997/98.<sup>13</sup>

In the years after the foundation, the software was constantly renewed and is now one of the most widely used platforms in Germany, along with Moodle. ILIAS is an open-source learning platform for companies, schools, universities, and the public sector.<sup>14</sup>



Figure 7: Logo ILIAS<sup>15</sup>

Figure 11 shows a demo course in ILIAS.

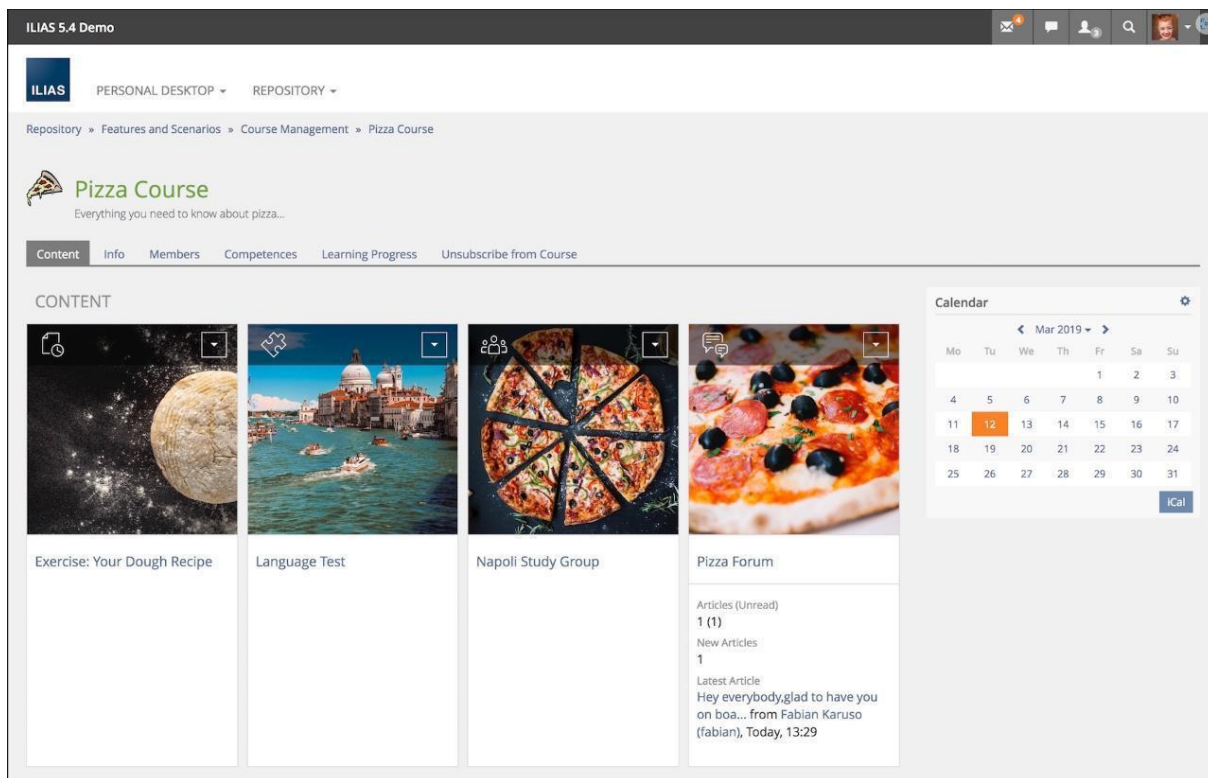


Figure 8 : Demo course<sup>16</sup>

<sup>13</sup>Kiedrowski, Kunkel: Gestaltung von Lernplattformen als Open-Source-Software am Beispiel der Plattform ILIAS. 2005, S. 446

<sup>14</sup> ILIAS brochure: Accessed 11/04/2022, 4:50 PM, [goto\\_docu\\_file\\_4712\\_download.html \(ilias.de\)](https://ilias.de/goto_docu_file_4712_download.html).

<sup>15</sup> ILIAS brochure: Accessed 11/04/2022, 4:55 PM, [goto\\_docu\\_file\\_4712\\_download.html \(ilias.de\)](https://ilias.de/goto_docu_file_4712_download.html).

<sup>16</sup> ILIAS homepage: Accessed on 06/11/2022, 5:50 PM [About ILIAS - ilias.de](https://ilias.de)

## Functions<sup>17</sup>

In this open-source standard program a lot of functions are integrated. The following list contains a selection of relevant functions for the project.

### General

ILIAS features a responsive web application as well as a customizable menu structure, message center, and context-sensitive online help.

### Personalization

A personal dashboard displays the favorite learning objects, courses, and other content. An overview of one's own learning success, an appointment calendar, certificate management are also available.

### Learning content management

Course content is provided centrally for all content objects (courses, groups, learning modules, wikis, glossaries, podcasts, and more). Full LOM metadata markup is integrated, and ILIAS includes SCORM 1.2 and SCORM 2004 certification.

### Learning and course management

The following functions are integrated for the implementation of courses and course planning:

- Courses and study programs to support teaching and training programs available
- Sessions for mapping face-to-face events
- Synchronized release of learning objects
- Learning goal-oriented provision of content
- Learning progress control at course level
- Individual learning planning in courses
- Management of scheduled tasks
- Feedback functions for participants
- Certificates and badges for documentation of the learning progress
- Student management
- Registration procedure (including limitation of participant numbers and move-up procedures)
- Automatic and manual notification functions

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<sup>17</sup> Vgl: ILIAS Broschüre: Zugriff am 04.11.2022, 08:15 Uhr, [goto\\_docu\\_file\\_4712\\_download.html \(ilias.de\)](https://www.ilias.de/goto_docu_file_4712_download.html)

## Test & Assessment

For carrying out a transparent and fair performance assessment, all common assessment methods are available in ILIAS, as the following list shows: Solutions for e-exams, OpenBook-exams and self-study tests

- Question types: Single- / multiple-choice, fill-in-the-blank text, assignments, or matching tasks, and several more.
- Plug-in interface for new question types
- Equation quizzes with randomization of mathematical parameters
- Management of question banks
- Support of editorial processes
- Definition of editing options
- Time processing and grading schemes
- Differentiated result evaluation (incl. export)
- Certificate function
- Learning progress control
- Individual assessment for examination and staff interviews

## Cooperation

In addition to a plug-in for video conferencing and a chat function, the following functions are available for working in a team:

- Scheduled and password protected registration
- Container for cooperative editing of files
- History and version control of files
- Data collection for the structured collection of information
- Group mail and public notes

## Other functions

In addition to the features mentioned above, ILIAS offers a wiki, a survey tool, and a way to integrate multilingualism within a course.

## Basic data

**Developer:** ILIAS open-source e-Learning e.V.

**Homepage:** [ilias.com](https://ilias.com)

**Licensing:** Open source

**Users:** > 1.000.000<sup>18</sup>

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<sup>18</sup> ILIAS Homepage: Accessed 11/05/2022, 8:15 AM, <https://www.ilias.de/open-source-lms-ilias/>



### 3. General digital teaching media

Digital teaching media serve as a supplement to teaching with learning platforms and offer support for interactive collaboration between teachers and learners. Furthermore, they facilitate the creation of teaching materials and offer assistance in checking learning objectives.

A selection of digital teaching media is described in the following subchapters. The use of the tools presented is not limited to teaching with learning platforms. They can also be integrated excellently in face-to-face teaching.

#### 3.1 Digital media for learning objective control

##### **Kahoot**

Kahoot is a platform that allows you to review and deepen classroom material in a playful way. The principle is based on a quiz in which the students collect points for correct answers. At the end of the quiz there is a virtual award ceremony for the most successful students.

The basic version can be used free of charge after registration. No registration is required for participating learners.

Procedure:

The teacher prepares a list of questions on a topic that has already been covered in class. For each question several answers must be defined, including wrong or misleading answers.

The quiz created in this way can remain private property of the creator, but it can also be made publicly available to other users of Kahoot. In this way, an extensive library of quizzes for a wide range of topics and target groups has been created over time. A Kahoot can thus be done with relatively little effort by accessing existing quizzes in the existing database.

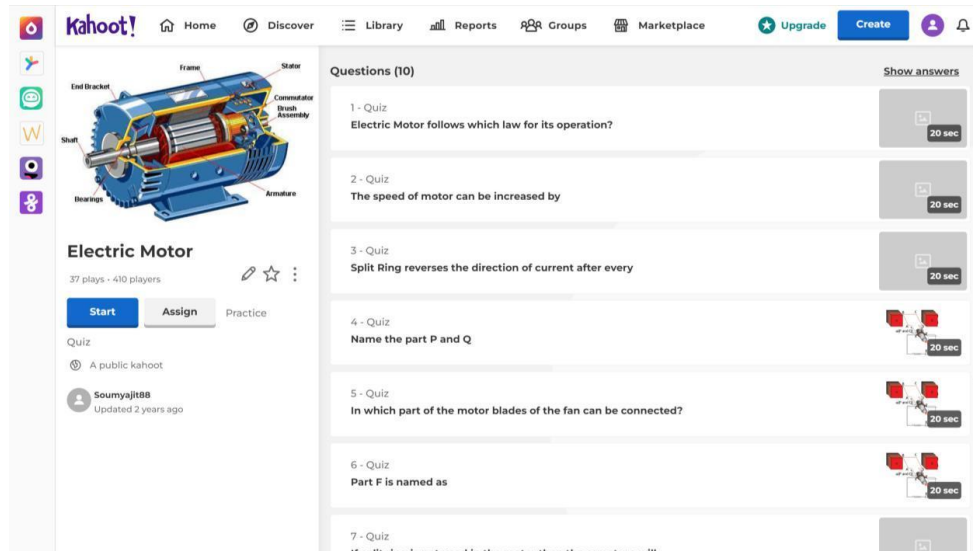


Figure 9: Screenshot Kahoot!<sup>19</sup>

By starting the quiz, a game PIN is generated. Participants must then confirm their participation in the game at <https://kahoot.it> with the previously generated PIN and a freely selectable nickname.

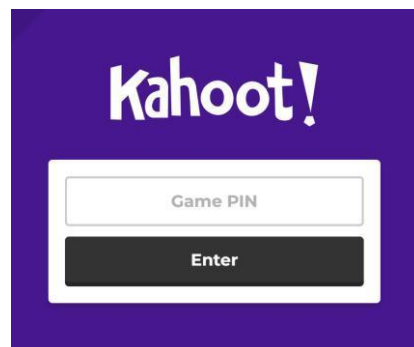


Figure 10: Screenshot Kahoot! - Game participation<sup>20</sup>

Each of the participants gets several points for a correctly answered question, depending on the duration of their answer. After each question an intermediate ranking is announced. After the last question, the final result is presented in the form of a virtual award ceremony.

Kahoot is very suitable for "loosening up" the lessons by conducting a prefabricated quiz, e.g. on the topic of general education.

**Link:** <https://kahoot.com/Quiz-Konfiguration>

**Link:** <http://kahoot.it> Participation in the quiz

<sup>19</sup> Kahoot!: accessed 10/2/2022, 9:15 AM, <https://create.kahoot.it/details/809d8b1a-f837-4121-af05-f7bbcbfe669f>  
<sup>20</sup> Kahoot!: accessed 10/2/2022, 9:20 AM, <https://kahoot.it/>

## Microsoft Forms

MS Forms is a simple and intuitive tool for creating surveys, collecting feedback, and checking learning objectives via quizzes. MS Forms is part of the Microsoft Office 365 suite and can be run via web access. The created forms are stored in a OneDrive cloud.

A Forms form consists of at least one, but usually several questions. For questions there are several answer types like selection, text input, rating, order which is defined when creating the question.

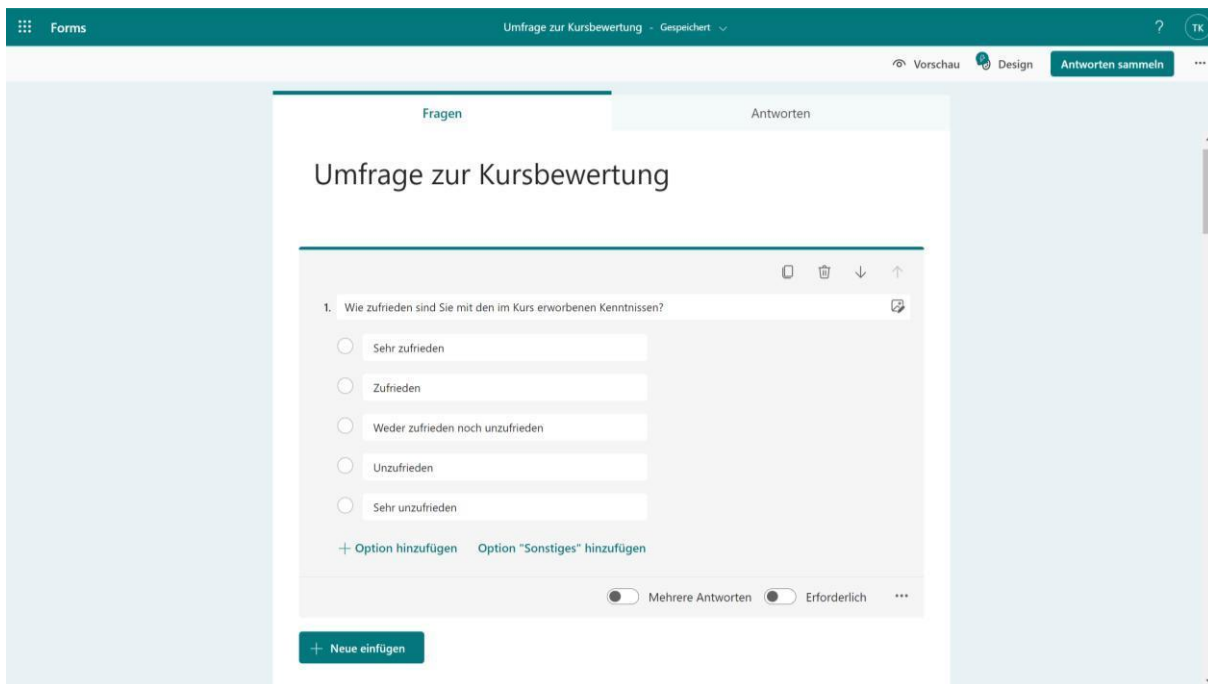


Figure 11: Screenshot MS Forms - Question creation

The design can be selected from templates, but can also be customized by the creator. A preview mode already shows the participants' views at the participants of the survey. The final design of the surveys to be conducted on mobile devices, but can also be done on computers.

As already mentioned at the beginning, Microsoft Forms can be used for a wide variety of tasks for participant surveys. Following, a closer look at quizzes to check the accomplishment of learning objectives check will be taken.

## Forms and learning objectives:

When checking the accomplishments of learning objectives via a quiz in MS Forms, the first step is to define the questions with the appropriate type of expected answer. There, attention should be paid to a varied design. A maximum number of points can be awarded for each question. A medium such as a picture or video can be incorporated into the question. In addition, a time limit for the survey can be specified.

The survey can be carried out via the menu item *Collect responses*. The participants can be reached via names, groups or similar. If people outside your organization are surveyed, the survey can alternatively be sent via a link.

After the participants have handed in their answers, it is up to the teacher to assess the survey. In doing so, he or she can check the questions for each quiz handed in and, if necessary, award additional points for individual answers. The results of the survey can also be exported as an Excel spreadsheet. This offers an advantage for very extensive surveys which produce large amounts of data.

A useful feature is the statistical evaluation of the answers. The answers given are graphically evaluated according to frequency. This provides the instructor with valuable feedback on the participants' knowledge of individual topics.

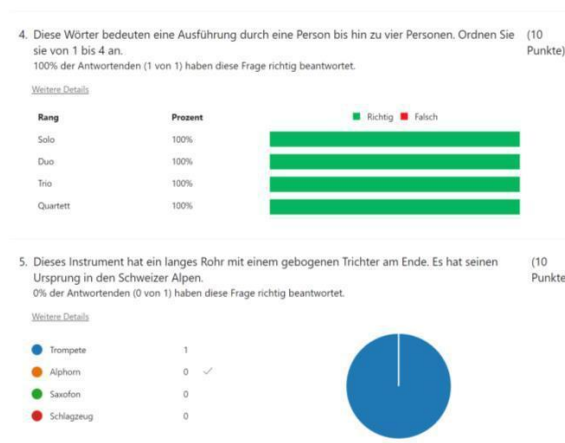


Figure 12: Screenshot MS Forms - Evaluation

Once the assessment is complete, the rating can be posted.

**Link:** <https://forms.office.com/>

### 3.2 Digital media for interactive collaboration

#### Online Mind Mapping

A mind map is used to graphically represent topics, document meetings, brainstorming sessions, etc. The documentation of a brainstorming session among several students, is one out of many standard examples for the usage of mind maps.

The idea behind digital mind maps is that several participants from different locations can access the same mind map and work on it simultaneously. The idea behind digital mind maps is that several participants from different locations can access the same mind map, as well as to fill and edit it simultaneously.

The instructor creates a mind map with a suitable layout and design and shares the link with the participants. Participants have access to the shared mind map via this link and can create a wide variety of entries. Text entries, images, sketches, videos and much more can be created via an input mask and added to the page. The link can be provided to the participants as a QR code, for example. This procedure is described in chapter 2.3.4.

For the purpose of mind maps, there are several different online tools that offer similar functions. A selection of tools is available at the end of this subchapter as a link to the web address of the individual manufacturer.

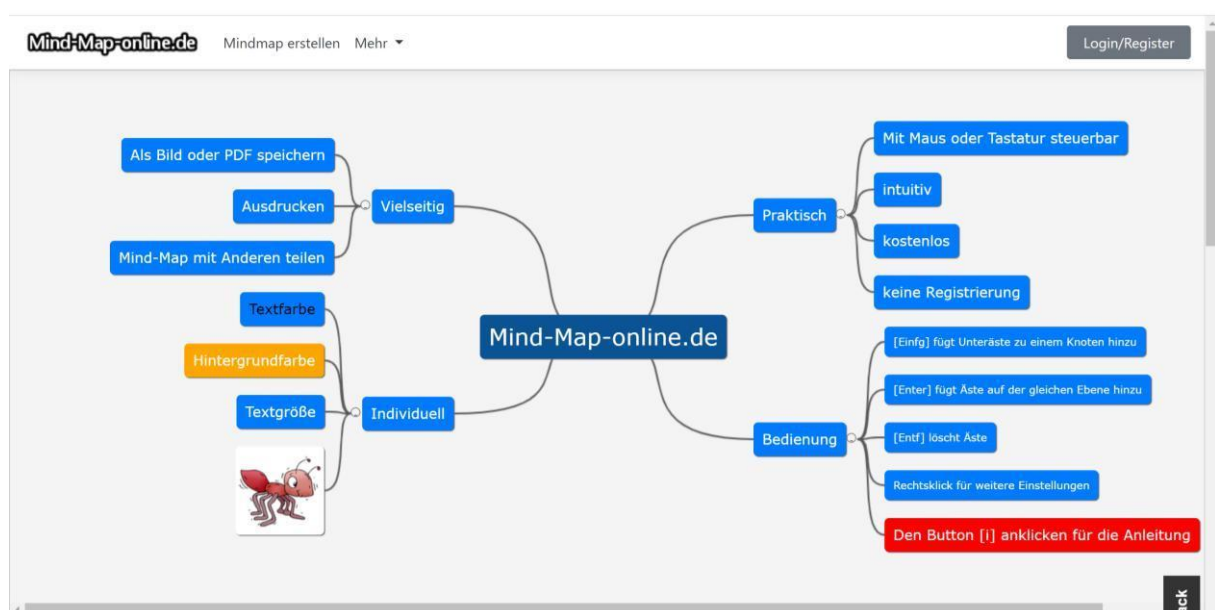


Figure 13: Screenshot Mind-Map-Online.de <sup>21</sup>

<sup>21</sup> Mind Map Online: Accessed 11/7/2022, 12:10 PM, <https://mind-map-online.de/>

The position on the page as well as the branches can be changed by drag and drop.

Online mind map tools from different companies can be accessed using the following links:

Link: <https://de.padlet.com/>

Link: <https://mind-map-online.de/>

Link: <https://www.wisemapping.com/>

## Etherpad

Etherpad is a simple way to create or edit a shared text document via a web interface. No registration is required for either the teacher or the students.

On the main page of Etherpad, there is a possibility to create a new pad or to open an existing one. In order to open an existing document, the name of it must be known. Alternatively, a pad can be accessed via a shared link. When creating a new pad, a runtime for the pad must be specified. After this time the file will be deleted from the server, so it is no longer available. Accordingly, one must take care of a backup copy in time.

In the Import/Export menu item, you can select a desired file format for this purpose.

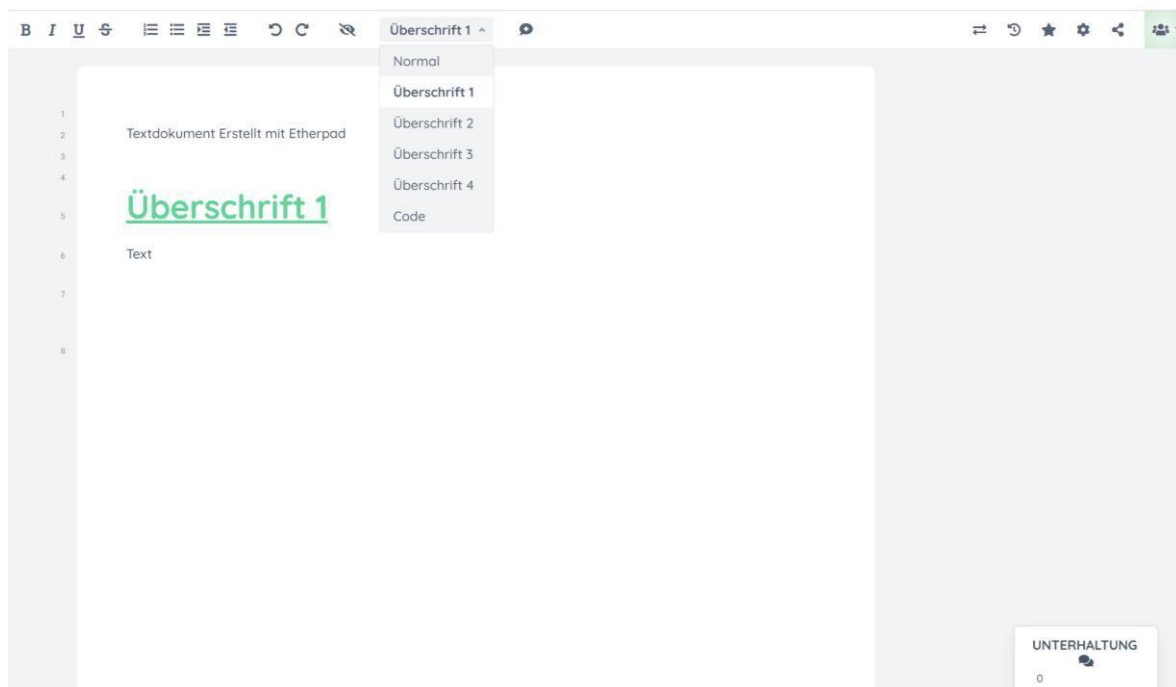


Figure 14: Screenshot Etherpad<sup>22</sup>

<sup>22</sup> Yopad: Accessed 10/28/2022, 9:20 AM, <https://yopad.eu/p/KT2022>

To create the text file, some quite simple commands for structuring a text document are available. In contrast to the classic text editing program, several users can work on the document at the same time. For differentiation, the individual work is marked according to the different authors with individual colors.

The people who are working on the document at the same time are listed in a user list. The menu item Conversation opens a chat window that can be used to contact the other participants directly.

**Link:** <https://yopad.eu/>

### **Oncoo**

With this tool you can interactively perform various methods of learning. The use is free of charge and possible without registration.

When creating an Oncoo, a password can be assigned. This must be sent to the learners with the link to the tool. The link is automatically generated after creation and is available as a classic link as well as a QR code.

In Figure 15 the main page of Oncoo, where one can select a suitable tool or method, is shown.



Figure 15 : Screenshot Oncoo<sup>23</sup>

23 Oncoo: accessed 11/1/2022, 2:20 PM, <https://www.oncoo.de/oncoo.php>

Depending on the chosen category, the specific method must be prepared accordingly. To exemplify, this can be the formulation of questions for a survey or similar. After the Oncoo is correctly formatted, it can be created, and an optional password can be assigned. The link generated in the following step must be provided to the students.

The participants can then provide their input, which is displayed as a result directly on the main page.

**Link:** <https://www.oncoo.de/>

### 3.3 Digital media for creating teaching materials

#### **Microsoft Sway**

MS Sway is a simple and intuitive tool for creating presentations. The tool is part of the Microsoft Office 365 suite and can be run via web access. The created presentations are stored in the user's OneDrive cloud.

When creating a Sway, various elements are presented on a slide in draft mode. These can be headings, text passages or other different forms of media. The layout can be adjusted very easily via the toolbar in the respective element. At any time during the creation of the presentation, it is possible to switch to playback mode to check how the presentation will look like when it is held. Additionally, there are numerous style sheets that provide a variety of preset designs to ease the creation of presentations.

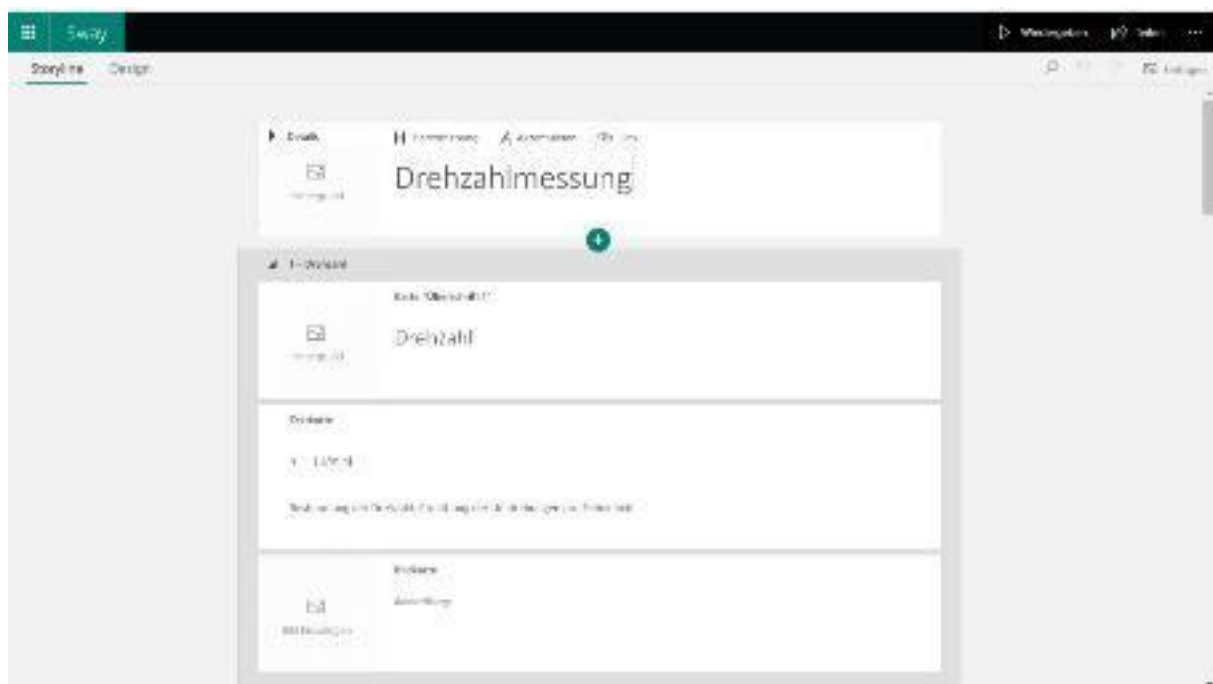


Figure 16: Screenshot MS Sway



Students must be provided with a link to Sway to give students access to the presentation. It should be noted that their access and functions can be restricted via the individual user rights. External people must be given access to the presentation. A very comfortable and fast method to create a presentation using Sway can be executed via the Start with a document function. For example, if you have already prepared teaching material in a Word document, a Sway can be created automatically from this file. For the creator, only some cosmetic adjustments must be made until the presentation is ready.

**Link:** <https://sway.office.com/my>

### Screen recording

If you want to create an instructional video for your classes, it can be helpful to show the activities on the screen in the video. This can be done with various tools for screen recording. Two of these programs can be accessed via a link at the end of this subsection.

A recorder is started via the website which records the activities on the screen. In most cases it is useful to record additional audio comments. Optionally, a video of the speaker can be displayed via a webcam.

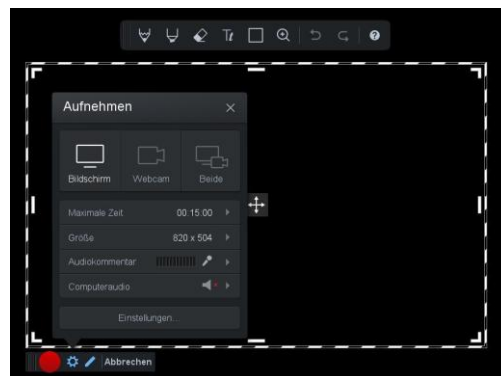


Figure 17: Screenshot screencast O Matic<sup>24</sup>

A tool palette is available, which can be used to display notes, sketches, and markers on the screen. After recording, the video can be edited, saved to the local hard drive, or uploaded to the cloud or video portals such as YouTube.

**Link:** <https://obsproject.com/de>

**Link:** <https://screencast-o-matic.com/>

<sup>24</sup> Screencast O Matic: accessed 10/28/2022, 6:00 PM, <https://screencast-o-matic.com/screen-recorder>

## Pixabay

Pixabay is a website with an extensive collection of photos, videos, illustrations, vector graphics and GIFs in high quality.



*Figure 18: Logo - Pixabay*

The content on Pixabay is available for download free of charge and is free of copyright. This content can therefore be used without hesitation in the preparation of learning materials.

After registering free of charge, you can search for suitable content using a search function and save it locally via the download link and integrate it into your learning materials. There is also the possibility to share your own pictures with the community.

**Link:** <https://pixabay.com/de/>

## QR code generator

Many digital teaching media are created on online platforms or are stored in a cloud storage. Learners can access the content via a link.

A very convenient way to share the links to the individual medium is a QR code. It must be scanned by the learners with their devices, like a smartphone. The content stored in the link then opens automatically.



*Figure 19 : QR code to goQR.me homepage*

An easy way to generate a QR code is offered by the website goqr.me. On this page, the link to be converted is copied into an input window and the QR code for the desired link is obtained directly. This can be downloaded as a PNG or JPEG file. In Figure 19 a QR code is shown. This code contains the link to the goQR.me homepage-

**Link:** <https://goqr.me/de/>

### 3.4 Specific digital teaching media

A particular challenge in distance learning is the design of practical laboratory exercises, as learners generally do not have the appropriate laboratory equipment at home. In the following chapter, special digital tools for distance learning are discussed.

In all cases, the instructional media are specifically tailored for a particular subject area or subject matter and not intended to be used universally.

#### Multisim Online

This tool is used to support practical laboratory lessons in the field of electrical engineering. The students' task is to build electronic circuits and perform measurements on these circuits. The intention behind this task is to deepen the understanding of circuits and apply this knowledge at practical tasks. With Multisim Online, laboratory exercises can be held as a distance course, and the students' results can be uploaded to a learning platform for assessment. There it can be checked and discussed directly on the students' screens.

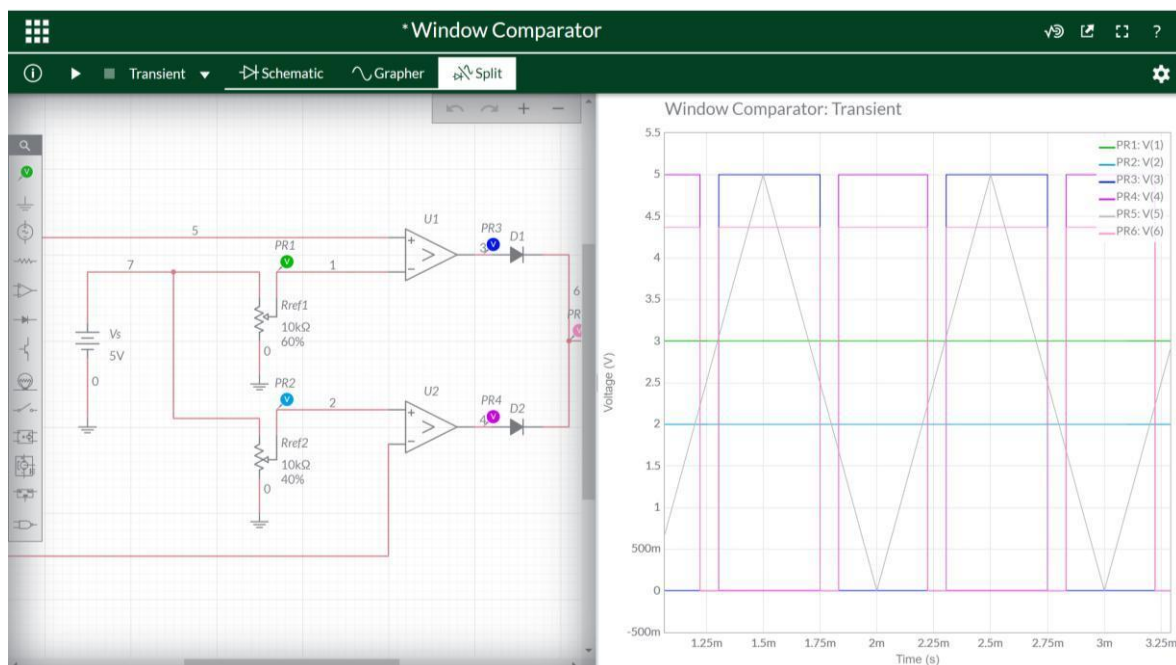


Figure 20: Screenshot Multisim Online<sup>25</sup>

<sup>25</sup> Multisim: Accessed 10/20/2022, 10:50 AM, <https://www.multisim.com/content/tYxUj3f7TFkLFYuY3R4eCP/window-comparator/>

The basic electrotechnical components are available in a library. These can be assembled into an electronic circuit diagram using drag and drop. The available measuring devices are also integrated into the circuit. The measurement results can be displayed graphically in simulation mode.

A registration is required to use Multisim Online. The use of the program is free of charge. A paid version with extended functionality is available from the manufacturer National Instruments.

**Link:** <https://www.multisim.com/>

## R1.A3.1 – NATIONAL REPORT

### 4. Online / distance training in vocational training (VET) and work-based learning (WBL) projects Austria

#### 4.1 Dissemination at national / regional level

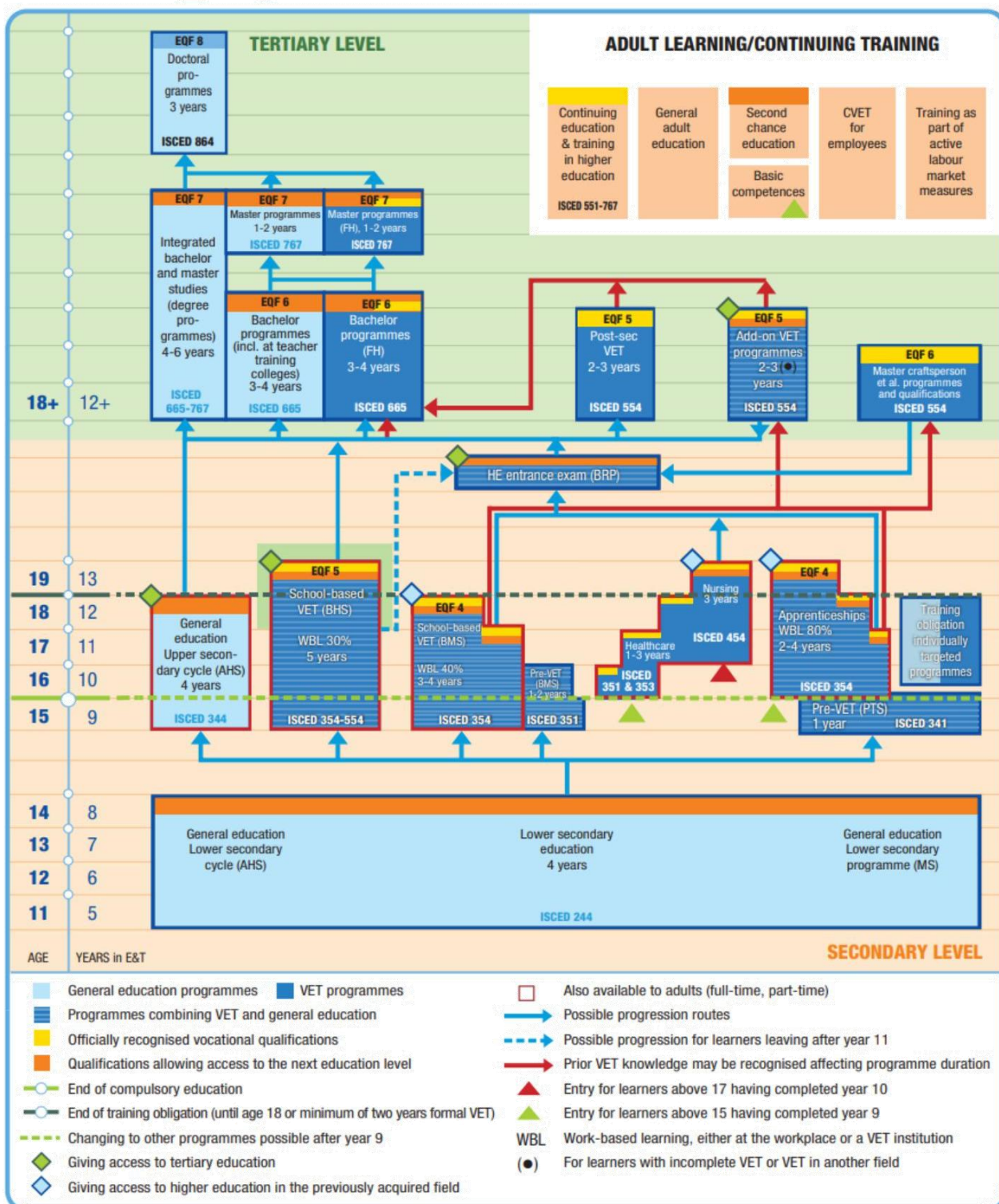
Austrian vocational education and training (VET) ranks high, as demonstrated by its differentiated offer and high attractiveness: around 70% of each age cohort follow a VET path at the end of compulsory education. The final year of compulsory education (year 9) and the first of upper secondary education coincide. Most school-based VET comes under the remit of the education ministry. Governance of apprenticeship is shared by the ministries of economy (company-based track) and education (school-based track), the social partners and the Länder. There is also a variety of VET programmes at tertiary level and for adults.

As you can see in the following picture, the dark blue rectangles are VET programs. The WBL content can only be seen in the secondary level (30% - 80%) compared to 0% WBL in the tertiary level.<sup>26</sup>

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<sup>26</sup> CEDEFOP: Accessed 20.12.2022 09:00 AM <https://www.cedefop.europa.eu/en/tools/vet-in-europe/systems/austria-u2>

# VET in the Austrian education and training system



NB: Simplified. ISCED-P2011.

Please cite as: Cedefop; ReferNet Austria (2022). VET in the Austrian education and training system. In: Cedefop; ReferNet (2022). *Vocational education and training in Europe* [database]. [www.cedefop.europa.eu/en/tools/vet-in-europe](http://www.cedefop.europa.eu/en/tools/vet-in-europe)

The following article was taken from the CEDEFOP Homepage and describes the situation during the pandemic in 2020.

### **Schools closed, short-time work at companies** <sup>27</sup>

Since 16 March 2020, all schools, including vocational schools, have suspended classroom teaching and switched to distance learning.

In company-based training, the situation varies greatly from one branch of industry to another and sometimes within branches: in many sectors, apprenticeship training is massively affected by company closures and short-time working. Especially in tourism, in those commercial enterprises not providing essential services, in personal services such as hairdressing, but also in numerous production companies, apprentices have recently spent several weeks at home and were only able to delve into the theoretical foundations of their profession via distance learning. Other companies were able to maintain their training at least partially in training workshops or with home office solutions. At the same time, a temporary exemption from school was granted for apprenticeships in essential services and critical infrastructure to ensure that the apprentices are fully available to the companies during this critical phase.

An amendment to the Vocational Training Act (BAG) came into force on 1 May 2020 in order to make short-time work in affected companies possible in apprenticeship training as well ([2]). If the measures to combat the corona pandemic make short-time work necessary in a training company, the daily or weekly training period can be shortened or even reduced to zero hours for a maximum of three months. This possibility was limited in time until 31 August 2020.

In addition, a free telephone hotline was set up for questions from apprentices and training companies on training during the corona pandemic as part of the 'Coaching for apprentices and training companies' project.

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<sup>27</sup> CEDEFOP: Accessed 20.12.2022 09:00 AM <https://www.cedefop.europa.eu/en/news/austria-vocational-education-and-training-during-corona-crisis>



## **Development boost for distance learning**

The choice and design of the appropriate form of distance learning at vocational schools falls within the remit of the respective school. In addition to written assignments and work assignments for self-study, digital and multimedia online learning services are used intensively.

The focus is on practice and consolidation of already learned content. At part-time vocational schools for apprentices, the development of new content is also compulsory, whereas at full-time VET schools and colleges this was approved after Easter and is the autonomous decision of the schools. However, it is clear that with the continuation of restrictions combined with increasing experience in the use of digital tools, the teaching of new content is becoming more important.

The increasing demand for digital support in distance learning has not only led to the optimisation and expansion of existing offers; new offers have also emerged. At the end of April 2020, for example, a media platform was set up in cooperation between the Ministry of Education and the public television broadcaster ORF, giving schools, universities of applied sciences and universities access to approximately 800 journalistic documentaries and magazine articles of public-law quality, which can be used to support digital teaching.

In the construction sector, a digital training portal had already been developed in 2019 for apprenticeship occupations. This offer of the Bauakademien (construction academies), inter-company training institutions in the construction industry, with 70 online courses, 373 specialist topics, 90 instructional videos and 2 900 knowledge checks, has now been opened up to other educational institutions such as colleges of engineering and universities of applied sciences.

These examples show that during the crisis existing resources are being made available to new target groups and can be shared across all levels of education, especially between apprenticeship training, school-based VET and the academic field.



## **Completion of VET ensured**

Despite school closures and short-time working, it is ensured that the apprentices can complete their final year of training as planned. While part-time vocational schools for apprentices have been reopening for final-year classes since 4 May, and have been using distance learning to prepare for graduation in the summer, the apprenticeship-leave examinations – as well as master craftsperson and qualifying examinations – have also been conducted in the usual manner since 4 May. A directive issued by the Ministry for Digital and Economic Affairs meant that all apprenticeship-leave examinations were suspended until 30 April. As a result, around 7 300 planned examinations were unable to take place.

In school-based VET, the Ministry of Education has stipulated that the matriculation and diploma examinations at VET colleges and the final examinations at VET schools will be conducted from the second half of May. To this end, classroom instruction in the final-year classes resumed to a limited extent on 4 May. Regarding the examinations themselves, only written tests will be taken. The annual grades for the final year are also included in the overall assessments. Oral examinations are cancelled unless a pupil requests an oral examination to compensate for a negative assessment.

All examinations are carried out in compliance with safety and hygiene regulations (distancing regulations, face masks, disinfection). These must also be adhered to in everyday school life and in training, but pupils do not have to wear face masks in lessons.

## **First conclusions ...**

In VET the crisis has highlighted some challenges and limitations of distance learning in technical and content-related areas, especially in structural and social areas. Problems such as a lack of terminal equipment or overloaded internet access for people learning at home were partly alleviated by providing terminal equipment from school stocks and with new purchases by public authorities.

There is great diversity in the digital learning and collaboration offers. The challenge is above all to create an overview of these offers, to check and guarantee the quality of the individual offers and to ensure access.

In many cases it cannot be taken for granted that young people have an undisturbed learning environment at home. The limited space for working from home often has to be shared with siblings or parents in a home office. For apprentices in short-time work, training is often reduced to consolidating theoretical content of their

profession, while the practical work in direct contact with the customer, with machines and equipment is stopped for weeks.

### **... and upcoming challenges**

One particular challenge is currently arising because of the compulsory internship for students at vocational schools, which traditionally takes place during the summer months. Many companies are reducing their internship positions due to the crisis. This means that the students not only lose an important opportunity to test and consolidate their theoretically acquired know-how in practice; these internships are also an opportunity to initiate future employment with potential employers. The Ministry of Education does not currently have any plans to abolish compulsory internships temporarily, however, internships that are not completed do not have any negative consequences for admission to the final examinations.

## 4.2 Experiences and Best Practices

In this section of the survey, participants\* are asked to share their experiences and insights regarding distance education. The answers are to be processed mainly as text entries.

Are you aware of tools, practices or systems of vocational training and work-based training that can be considered "good practices" and, therefore, that are replicable or useful in other European contexts / countries (for training providers and / or for public decision makers)?

Nein

??

nein

Die partizipative Lehre

---

Online Kurse (iMoox), div. Lernplattformen

Nein.

Nein, kenne ich nicht.

Figure 21 : Evaluation - best practices

*Number of responses: 11 from 27*

In the question, the participants were asked Figure 21 about "good practices" in distance learning as seen by them. 16 participants did not answer this question. It can be assumed that they are not aware of any methods.

Additionally, with the 11 entries submitted, it can be seen that very few are also aware of a method worth mentioning.

Only 1 entry refers to the learning platform iMooX, referring to Figure 21.

D-  
n

What were the lessons you learned following the implementation of distance / online training, before and after the COVID-19 pandemic, in relation to the delivery processes, the role of trainers and the new skills needed?

??

Gut für starke Schüler

vor der Pandemie habe ich noch nicht gelehrt

Beobachtete steigende Akzeptanz der Online Lehre, Lehrende zunehmend in der Moderationsrolle, Förderung der digital skills und der Kenntnisse über die Plattformen erforderlich

---

Es ist schwer, die Lernenden zum Onlineunterricht zu motivieren. Die Gefahr des "Abtauchens" einzelner Personen ist groß. Durch ständige Kontrolle der Lernenden und von Feedback - Übermittlungen ist es möglich, dass man die Lernenden motivieren kann.

Onlineschulung ist nicht mit Präsenzunterricht zu vergleichen.

Aufgrund der Covid Pandemie war bei Lehrern und Schülern eine sehr hohe Lernkurve und Bereitschaft in Bezug digitalen Unterricht möglich

Die Struktur ist wichtig.

Das sie technisch überfordert waren. Mit online Unterricht

Digitalisierung größtenteils nicht vorhanden, häufig technische Schwierigkeiten im Online - Unterricht, sowohl bei Schülern als auch Lehrern. Massive Defizite in der EDV, sowohl was die Ausstattung an Schulen als auch die Administration anbelangt

Lehrende als Mentor\*innen

Motivation der Lernenden sinkt mit Dauer stark ab

ein strukturiertes Vorgehen ist wichtig; SchülerInnen so gut es geht in den Unterricht mit einzubinden; gezielte Planung der Unterrichtseinheiten ist notwendig; ohne richtiges Equipment ist die Qualität der Online-Schulungen / E-Learnings sehr schwierig

Figure 22 : Evaluation - Teaching of the Online Training

Number of responses: 14 from 27

In answering the question in Figure 22 the participants shared their experiences regarding the implementation of distance learning during the Covid 19 pandemic.

According to the respondents, the basic prerequisite for functioning online teaching is good equipment and a functional learning platform or tool. The ability of teachers and learners to master the use of these tools is also essential.

The lessons must be well structured and the teachers are increasingly given the role of moderator or mentor.

Distance learning is very suitable for good students, but there is a risk that individual students may "drop out". The motivation of the learners decreases over time, so it is a special challenge for the teaching staff to motivate the students.

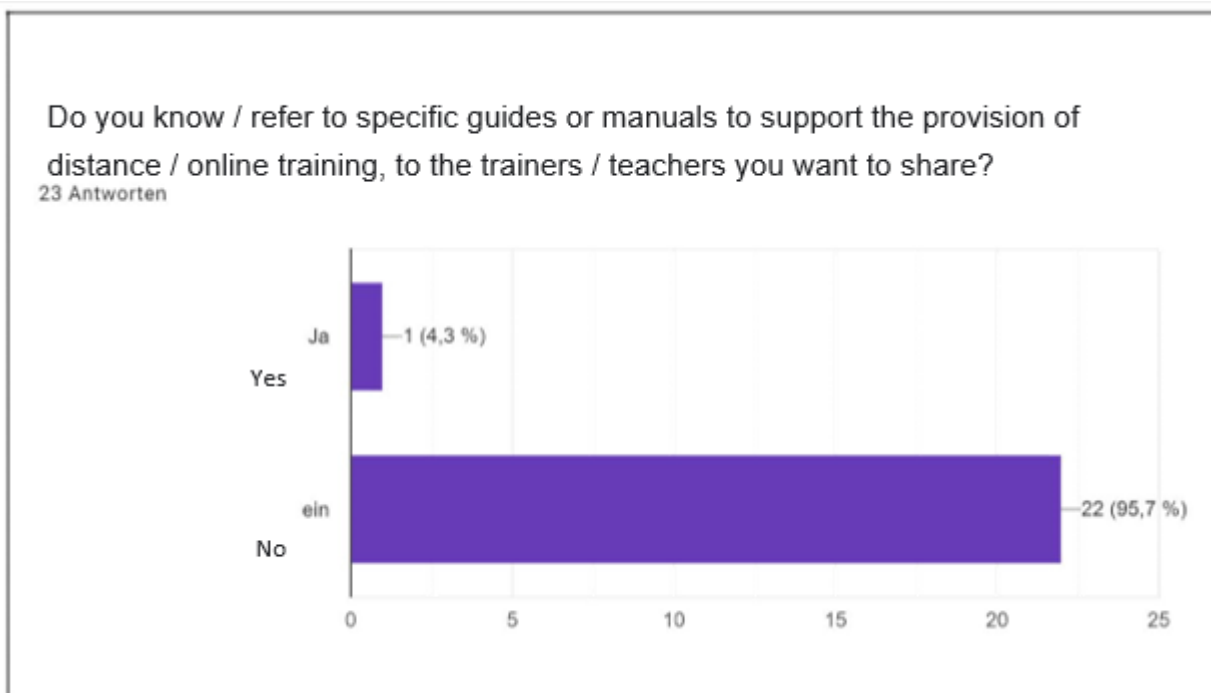


Figure 23 : Evaluation - Guides / Manuals

Number of responses: 23 from 27

In Figure 23 it can be seen that the majority of the participants are not aware of any manuals or guides that can assist in teaching via distance learning. Only one person positively answered this question. The need for action in this area of documentation is clearly evident.



Figure 24 : Evaluation - Guides / Manuals (Description)

Number of responses: 3 from 27

The person who positively answered this question thankfully shared a link to the distance learning guide they were familiar with. This is available under the link in Figure 24.



Figure 25 : Evaluation - personal data

Number of responses: 27 from 27

The final part of the survey is the request for consent to process personal data. As shown in Figure 25 the consent was given by all participants.

### 2.3 Competence gap [desk research + information collected through questionnaires, Section I, VII-XII + Results from Focus Groups]

The first part of this survey contains general questions about the person. In addition to first and last names, the e-mail address was also requested.

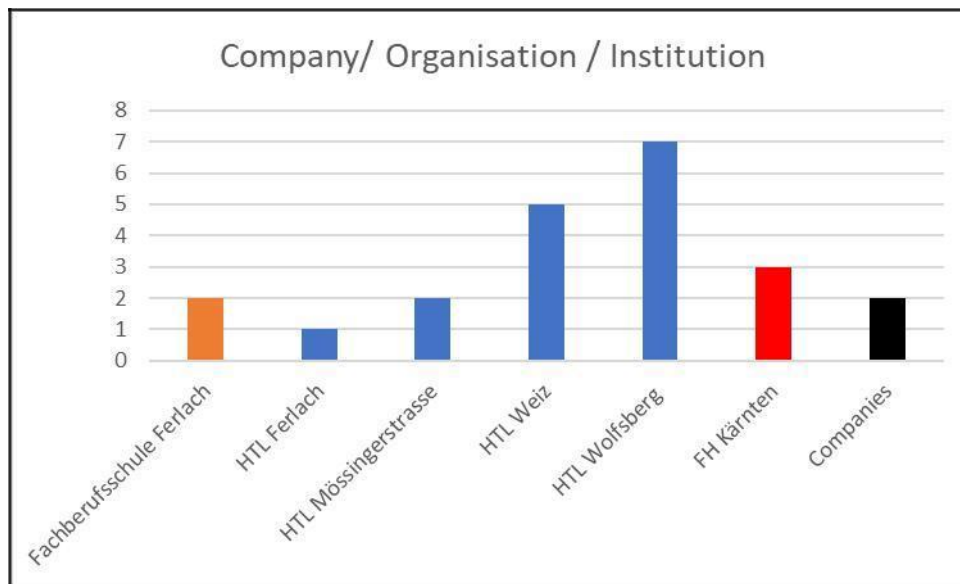


Figure 26 : Evaluation - Company / Organization / Association / Institution

*Number of responses: 22 from 27*

The Figure 26 shows the distribution of the participants of the survey with reference to their affiliation. The color coding divides the diagram into the different types, starting with the color orange for vocational schools. The blue bar belongs to the HTL's (Higher Secondary Technical Colleges) and the red one to the Universities of applied sciences. The black bar concludes with the companies. Figure 26 shows very clearly that the survey was completed by a very large number of people who work at a higher technical teaching institution. Likewise, three people from the Carinthian University of Applied Sciences took part. In order to be able to present a picture of the companies' situation, two persons from companies were also invited to take part in the survey.

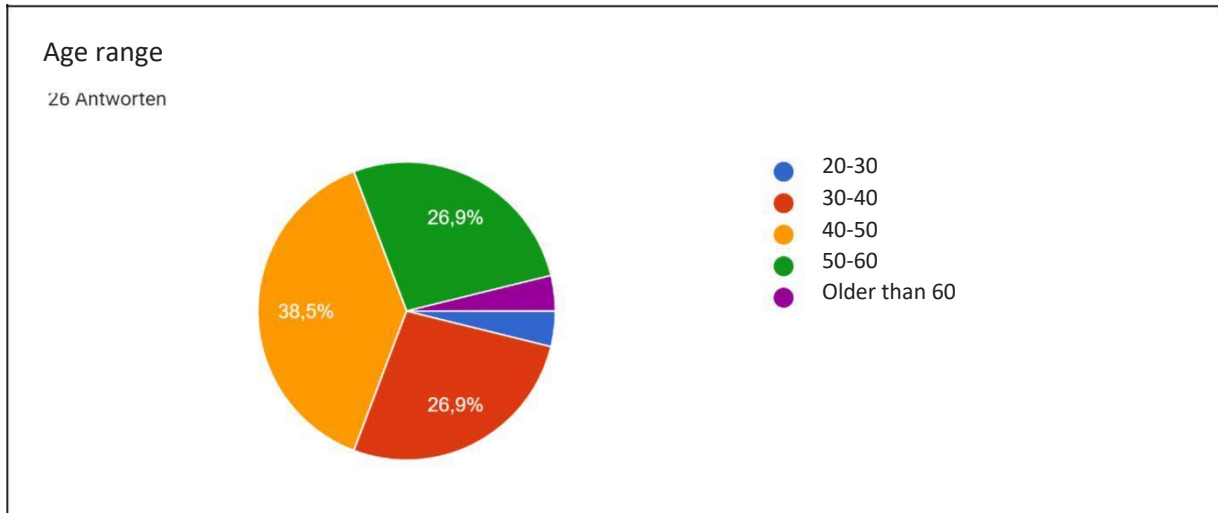


Figure 27 : Evaluation - age group

Number of responses: 26 from 27

Figure 27 clearly shows that the largest percentage of respondents are in the 30-40 age range, followed by the 40-50 and 50-60 age groups. As these three age groups mentioned earlier are very evenly represented in the survey, it can be entitled to be demographically representative.

#### 4.3 AREA 1 - Educational institutions and educational differences

Area 1 addresses issues related to educational institutions as well as educational differences.

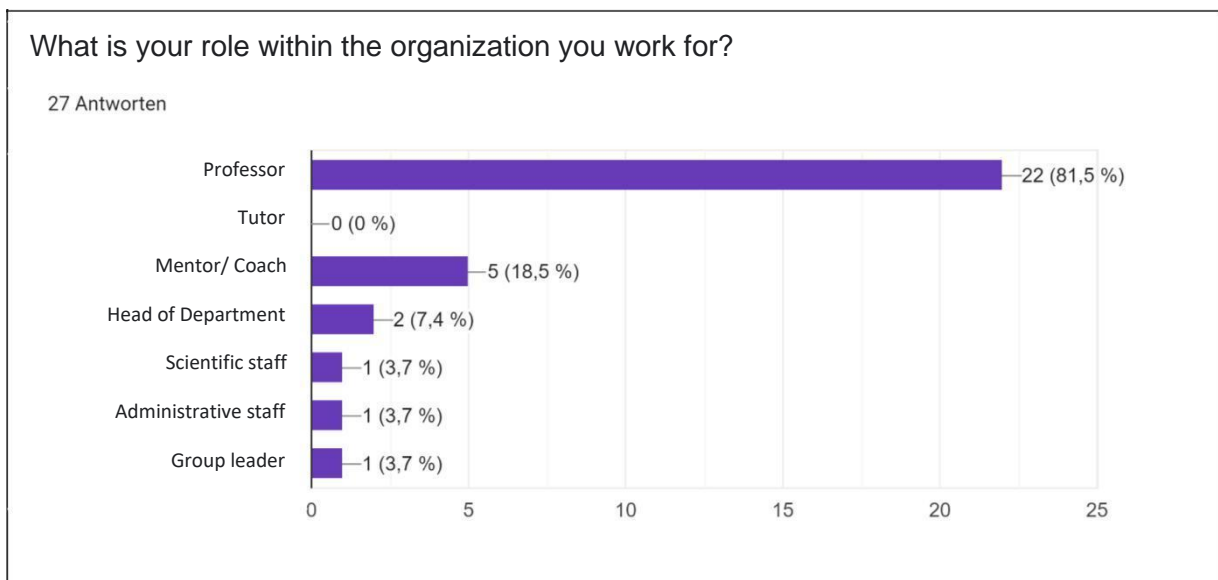


Figure 28 : Evaluation - Role in the company / organization / institution

Number of responses: 27 from 27

The overwhelming number of respondents practice the profession of being a teacher/professor with a percentage of 81.5%. Figure 28 shows that 18.5% mentors/coaches also completed this survey.



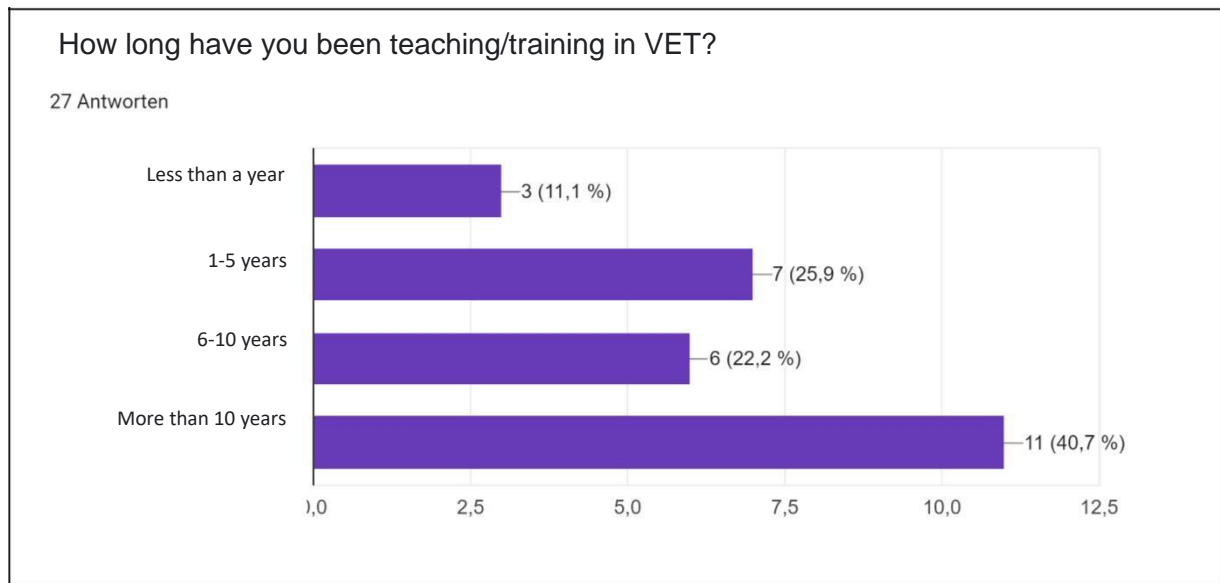


Figure 29 : Evaluation - work experience in vocational training

Number of responses: 27 from 27

The analysis of the question about professional experience (see Figure 29) shows a very good experience structure. This distribution of years suggests that this survey will form a very objective picture about the subject.

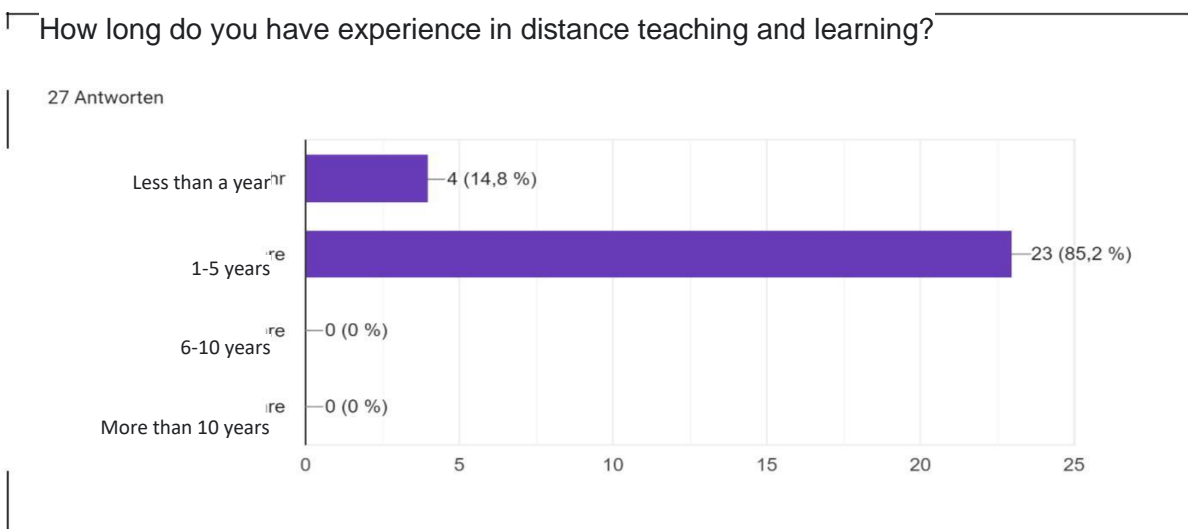


Figure 30 : Evaluation - Experiences Distance Learning

Number of responses: 27 from 27

The COVID-19 crisis, affecting students and teachers from March 2020 on, has had a very strong impact on the topic of distance learning. This can be seen very clearly as the range of experience mostly lies between 1 and 5 years in Figure 30.

Please state your knowledge and skills in the following technologies and tools

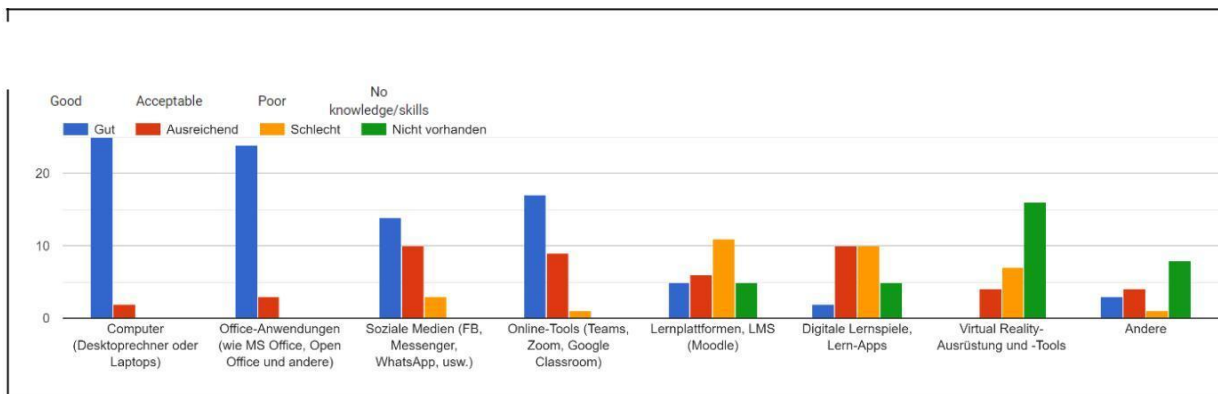


Figure 31: Evaluation - Knowledge and skills

Number of responses: 27 from 27

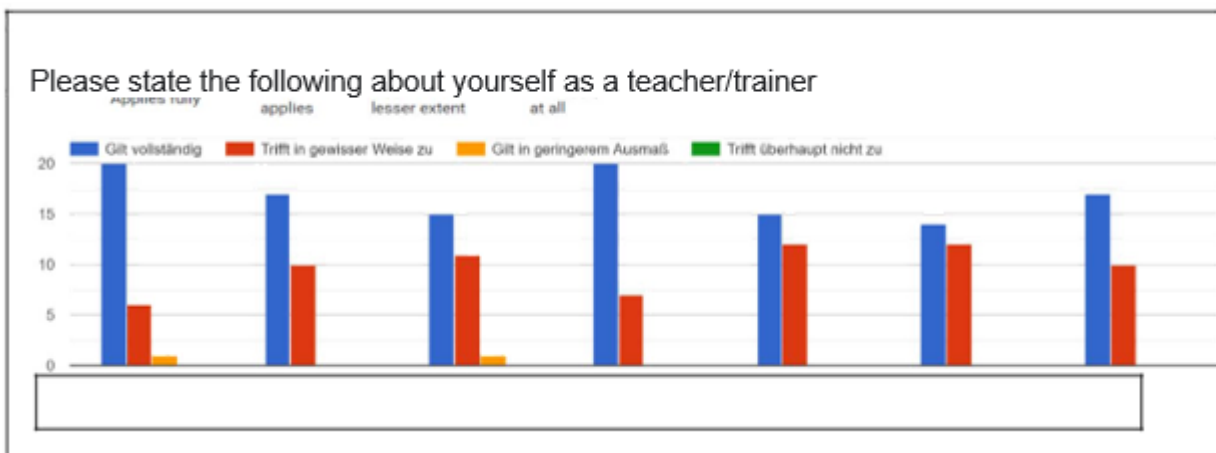


Figure 32 : Evaluation - Knowledge and Skills (Details)

Figure 32 shows the different knowledge and skills of the people interviewed. It is clear that people are very good with computers and office applications. When it comes to social media and online tools, the knowledge level decreases drastically. The answers show a very large gap in the use of learning platforms, digital learning games as well as virtual reality.

1	I encourage my students to work together/help each other to achieve a work task
2	I am able to inspire my students on specific topics
3	I support my students in exploring and applying innovative approaches for solving problems and to achieve work tasks
4	I support my students in implementing their ideas
5	I am able to motivate my students
6	I use methods that promote the problem-solving
7	I support and enable my students to define priorities
<i>Number of responses: 27 from 27</i>	

Figure 32 shows very clearly that all respondents overwhelmingly motivate, support and encourage learners.

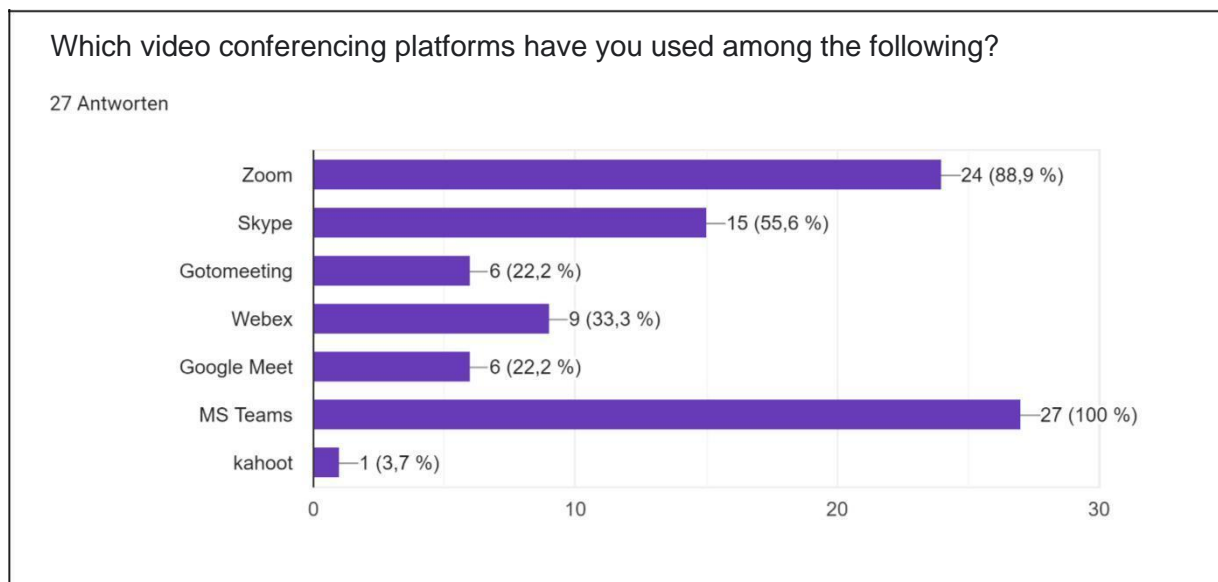


Figure 33 : Evaluation - platforms for video conferencing

*Number of responses: 27 from 27*

The results of Figure 33 represent the use of conferencing platforms and show very clearly that MS Teams and Zoom are the most used tools. Google Meet and GoTo Meeting bring up the rear with only 6 mentions each.

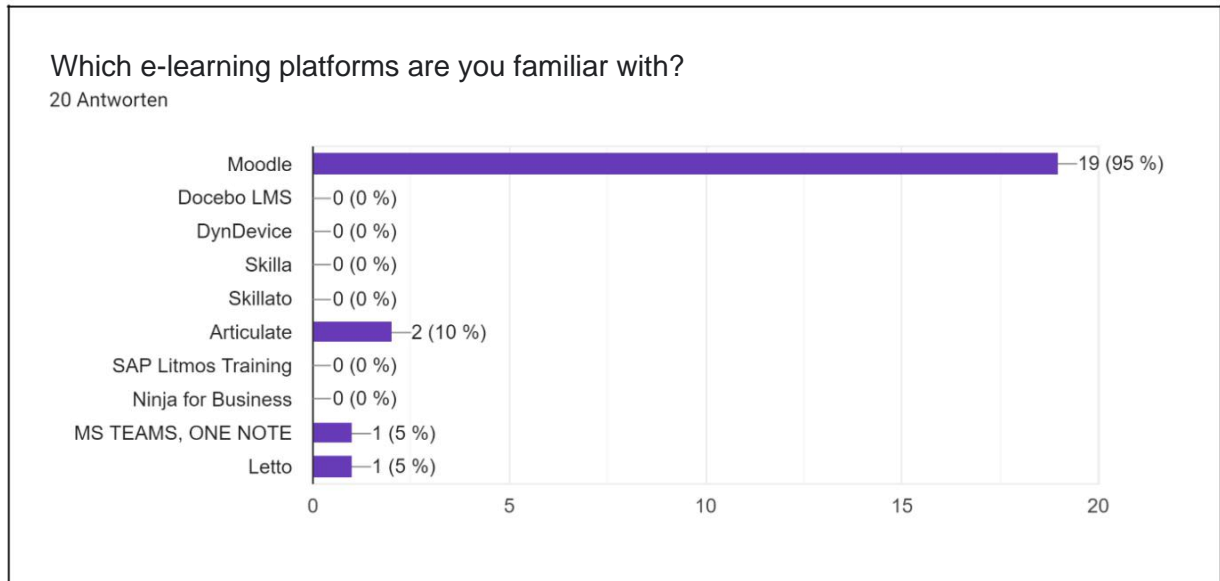


Figure 34 : Evaluation - Platforms for e-learning

Number of responses: 20 from 27

From Figure 34 a clear tendency towards utilizing Moodle (95%) can be seen.

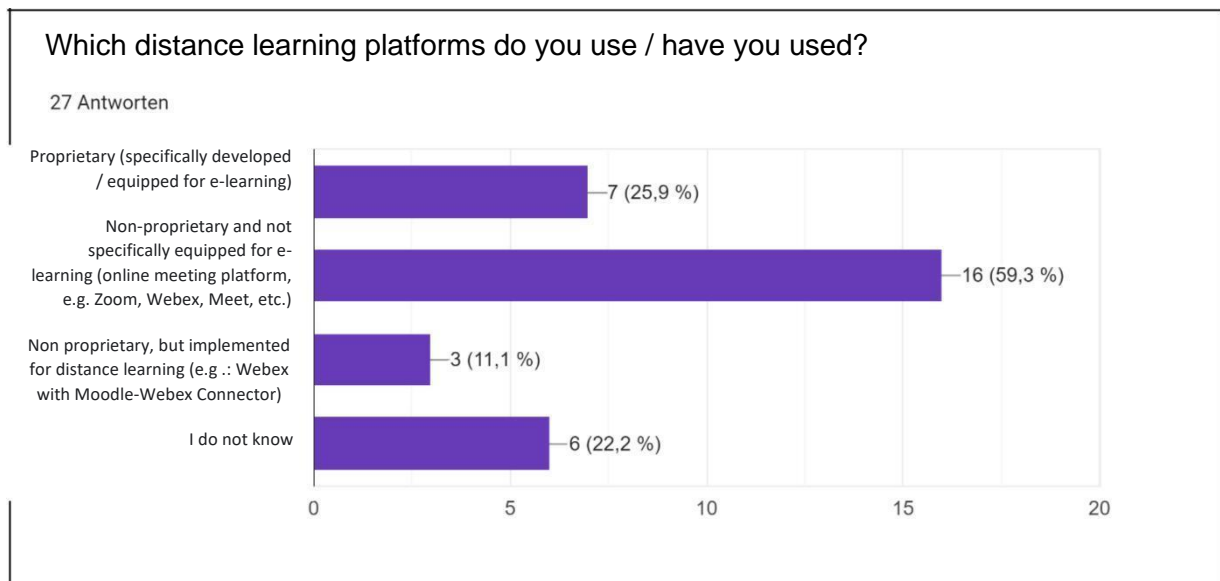


Figure 35 : Evaluation - Distance learning platforms

Number of responses: 27 from 27

For distance learning, mainly non-proprietary platforms not specifically equipped for e-learning were used (see Figure 35). Six people do not know details about the platforms they use.

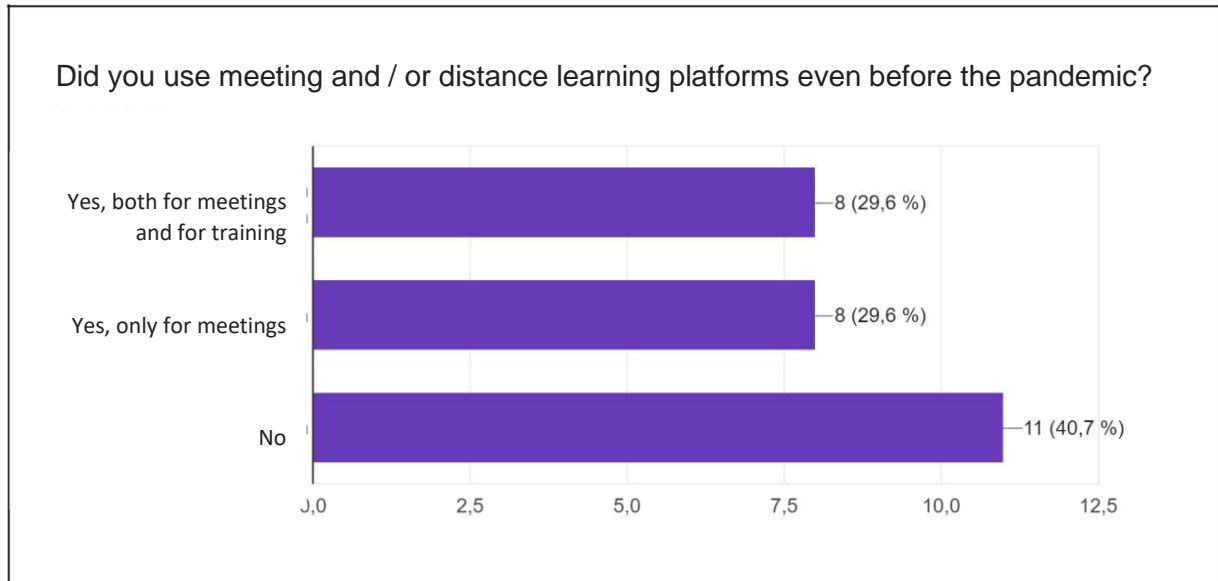


Figure 36 : Evaluation - pre-pandemic experience

Number of responses: 27 from 27

Figure 36 shows that in total (answer 1 and answer 2) more than half of the respondents had already used meeting platforms before the pandemic. However, a large proportion (40%) had no experience with meeting and distance learning platforms before the pandemic starting in 2020.

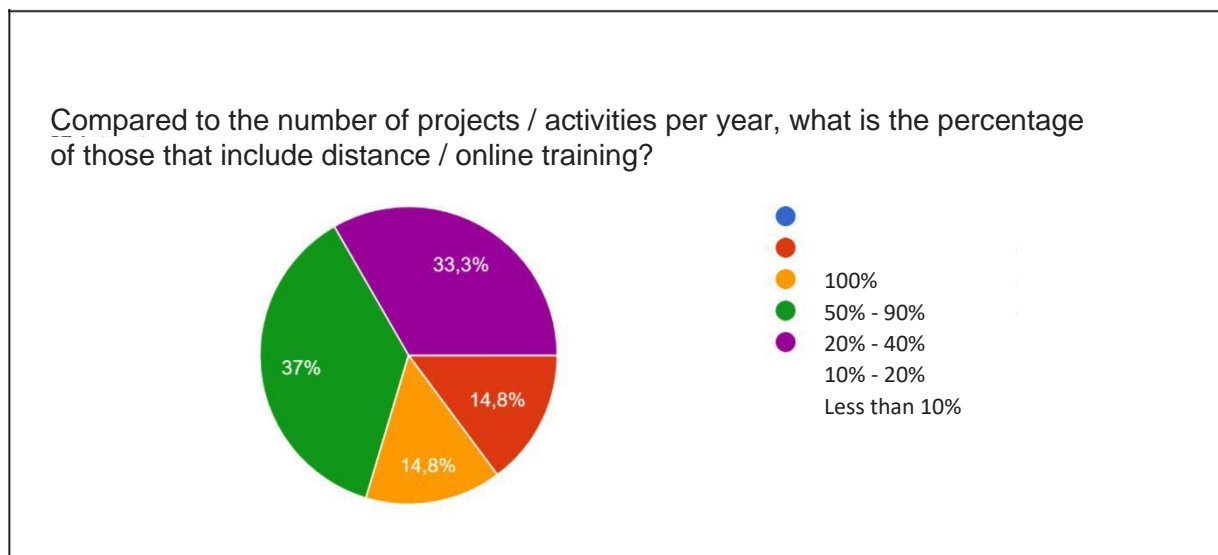


Figure 37 : Evaluation - Percentage of distance learning courses

Number of responses: 27 from 27

By analyzing the percentage of online activities (Figure 37), it can be seen very clearly that the percentage share up to a maximum of 20% is represented with a total of 70.3%. As a result, only about 30% remains for a share of more than 20%. From these values, one can conclude that the main part of teaching takes place offline.

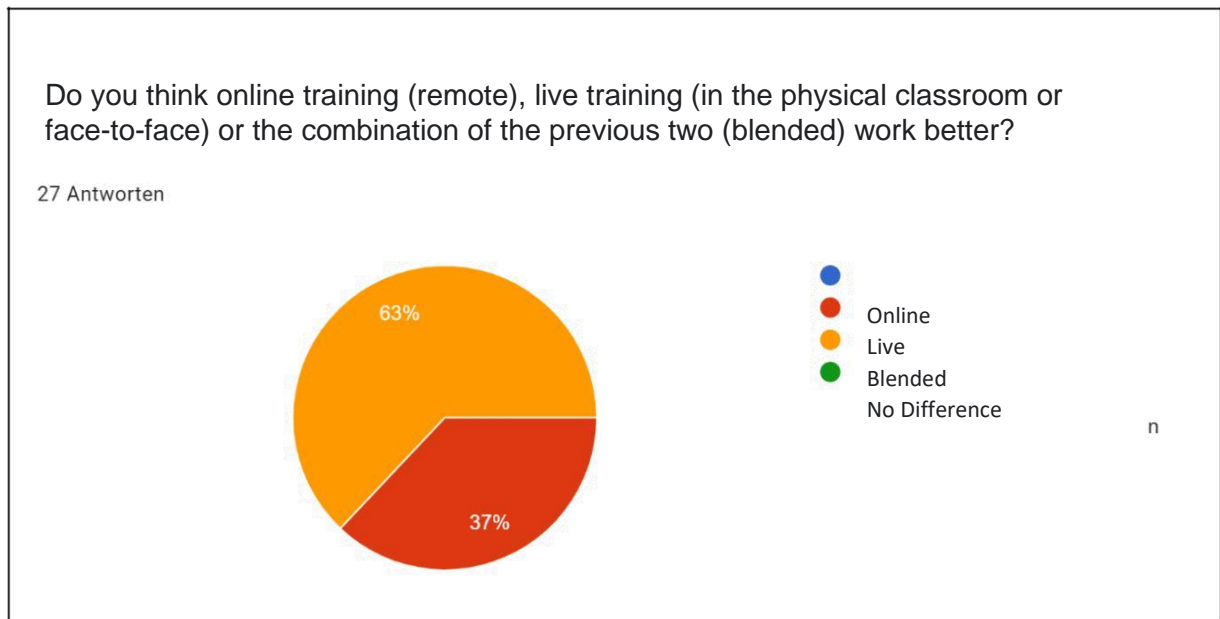
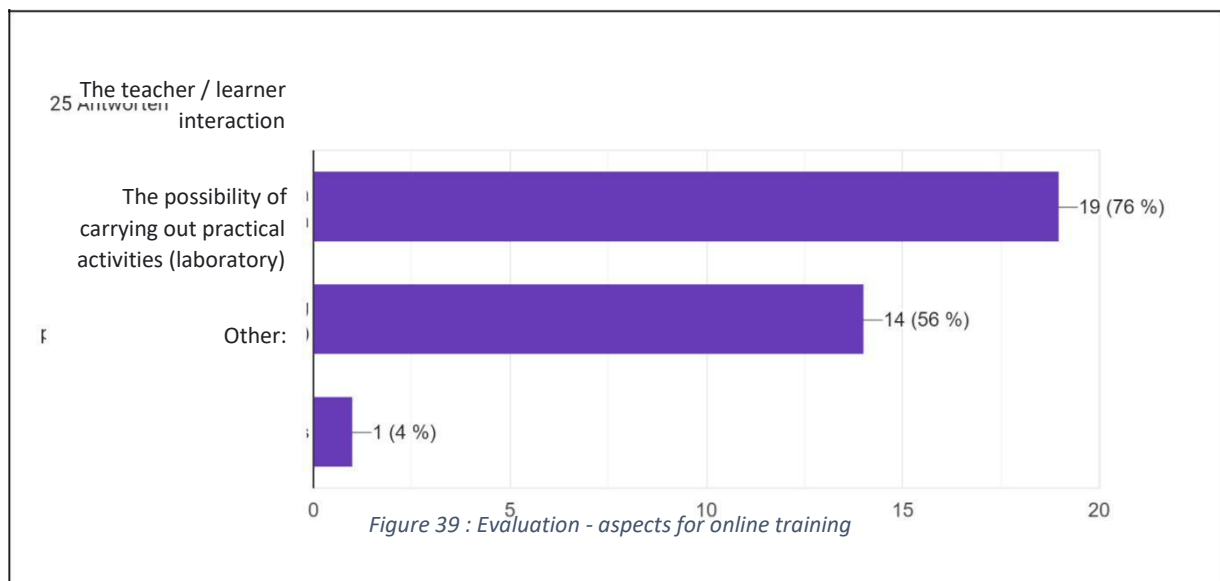


Figure 38 : Evaluation - Training methods function

Number of responses: 27 from 27

None of the respondents believes that online-only training is the most suitable form of training. About two thirds believe that blended learning works best. Likewise, a third find live instruction to be the best type of lecture, referring to Figure 38.

What aspects of live training would you like to bring to online training?



Number of responses: 25 from 27

In order to carry out good online teaching, the interaction between learners and teachers as well as the possibility of carrying out practical activities are of very high importance, according to Figure 39.

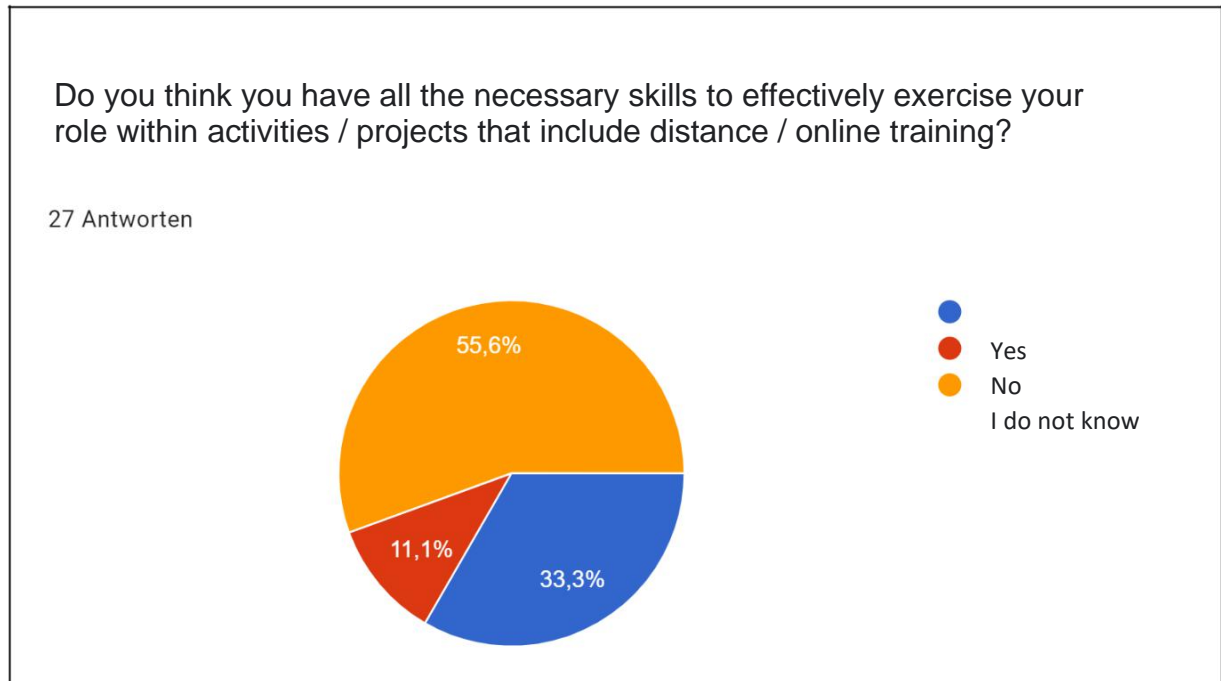


Figure 40 : Evaluation - Skills for Distance Learning

*Number of responses: 27 from 27*

Figure 40 points out that one third of the respondents have all the skills on distance education. More than half (55.6%) of the people have only partially all the skills on distance education design.

## Why?



Figure 41 : Evaluation - Skills for Distance Learning (Details)

Number of responses: 10 from 27

The free-text question to provide some detail on the skills yielded the following results (see Figure 41). It was mentioned that the topic of distance learning is very complex (interaction learners and teachers) and therefore much is still undiscovered. Also, the desire for training in this area was given as a response. Not all points are mentioned, because this exceeds the scope of this analysis.

Which of the following knowledge / skills do you feel you need to acquire / improve in the field of Distance / Online Training?

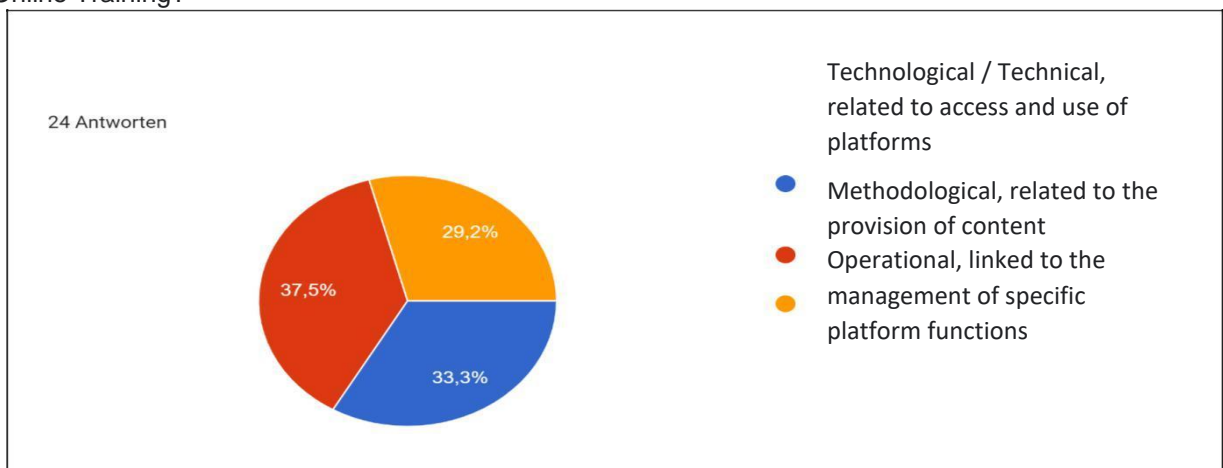
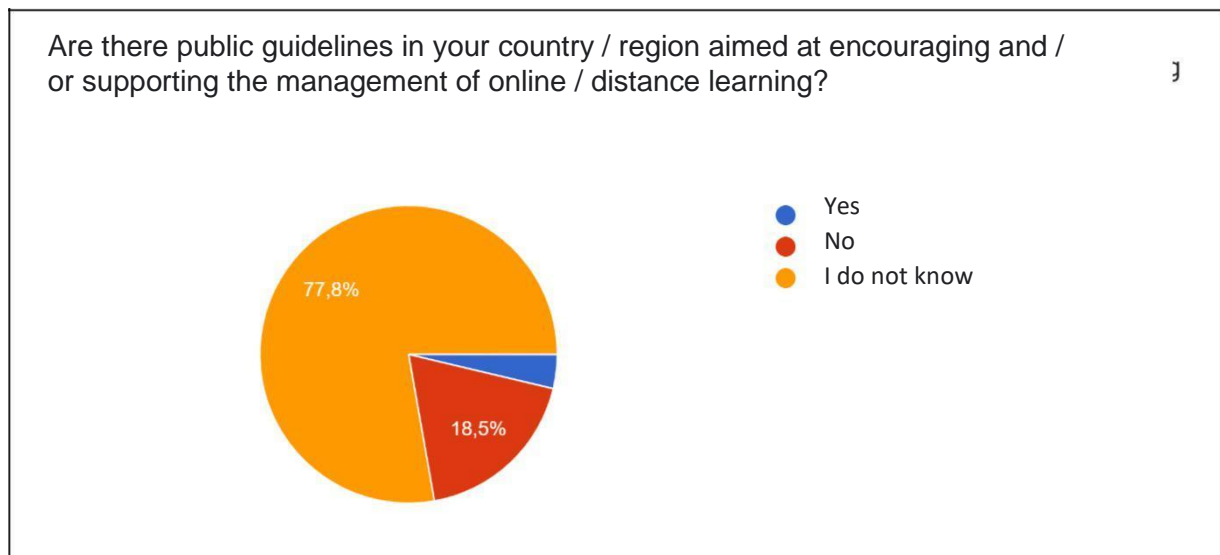


Figure 42 : Evaluation - skills in need of improvement



*Number of responses: 24 from 27*

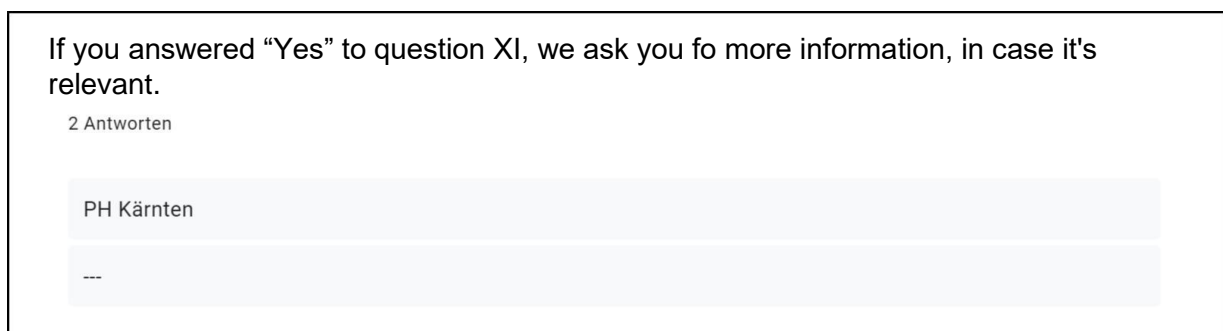
The answers to this question are divided into three equal parts. Therefore, a clear statement about the improvement of knowledge for each specific field is not possible. (see Figure 42).



*Figure 43 : Evaluation - public guidelines*

*Number of responses: 27 from 27*

Figure 43 shows very clearly that there is hardly any knowledge about the availability of guidelines in the regions or countries. Likewise, 18.5% of the respondents answered the question with no.



*Figure 44 : Evaluation - public guidelines (description)*

*Number of responses: 2 from 27*

According to Figure 44 there are guidelines for the implementation of distance learning only at the PH Carinthia, a university for teacher training in Austria.

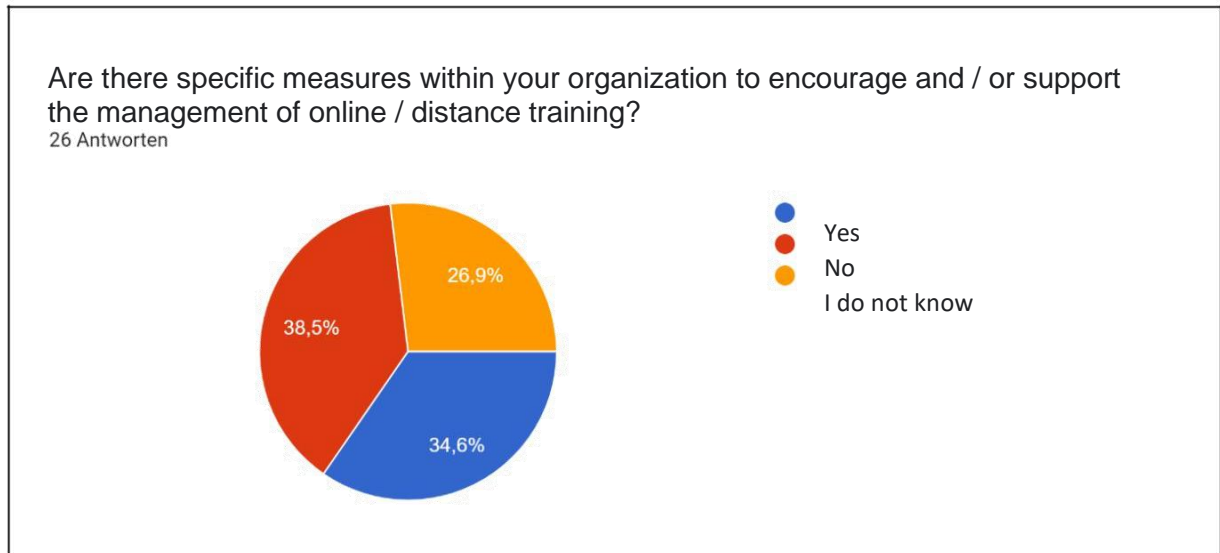


Figure 45 : Evaluation - Measures in the organization

Number of responses: 26 from 27

As can be seen from Figure 45 the answers are equally divided. The possible answers each account for about one third.

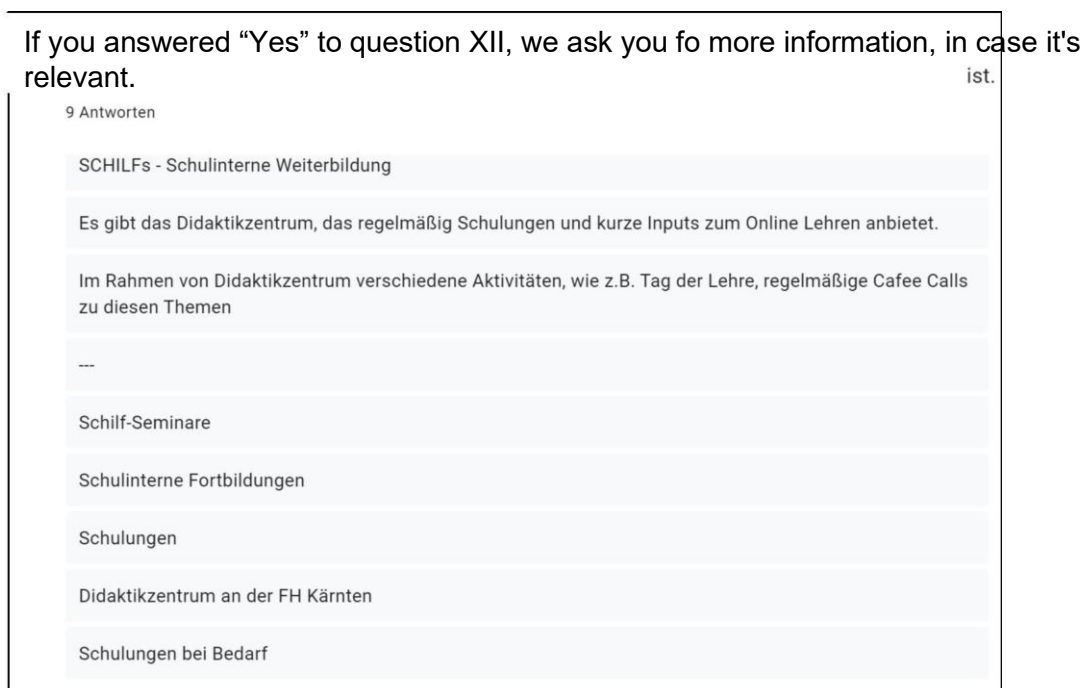


Figure 46 : Evaluation - Measures in the organization (description)

Number of responses: 9 from 27

The points mentioned in Figure 46 can be summarized as follows. The measures to promote further training in this area take place predominantly with the help of internal training of the respective organization.

#### 4.4 AREA 2 - Constraints and needs in relation to technology, types of activities and target groups

Area 2 of the survey aims to identify which features, functions, tools and resources a good distance learning platform should offer. On the one hand, the features of systems already in use are addressed, and on the other hand, desirable functionalities that are currently not yet available or only available in isolated cases.

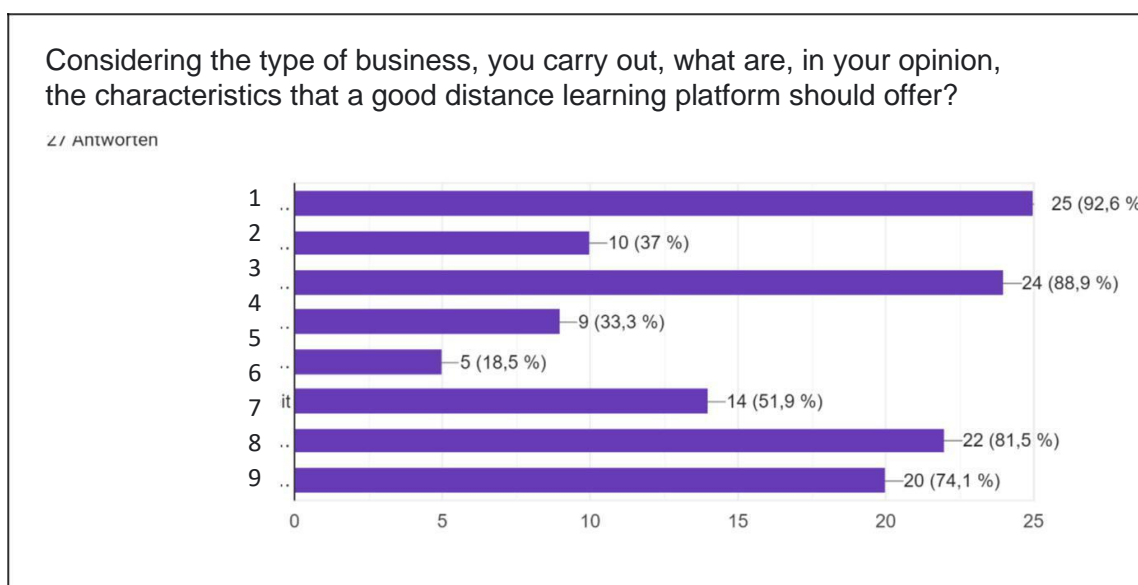


Figure 47 : Evaluation - Characteristics of a distance learning platform

Explanation	
1	Ease of use and intuitiveness (access and management of features)
2	Ability to generate reports and statistics on courses, contents, materials and learners (percentage of courses completed, tests passed, material downloaded, etc.)
3	Ability to generate interaction with users
4	Ability to interact with company systems (CRM, Calendars, touch points)
5	Ability to contain customizable portals / thematic areas
6	Free
7	Streaming (Live FAD): possibility to receive information with multimedia contents (PowerPoint presentations, enriched with Flash animations and transitions, 3D objects and video streaming, etc.)
8	Sharing: possibility of sharing information and multimedia contents
9	Other:

Number of responses: 27 from 27

Figure 47 shows the distribution of features that a digital learning platform should offer. A user-friendly interface that can be operated intuitively is a key requirement for the participants. Furthermore, the possibility of communication with the learners is essential. The provision of content via streaming and the sharing of content should also be available.

The statistical evaluation of the course was rated with lower importance. The same applies to the adaptability of the portals and the interfaces to other company systems (e.g. calendar synchronization). About half of the participants wanted to use the platform free of charge.

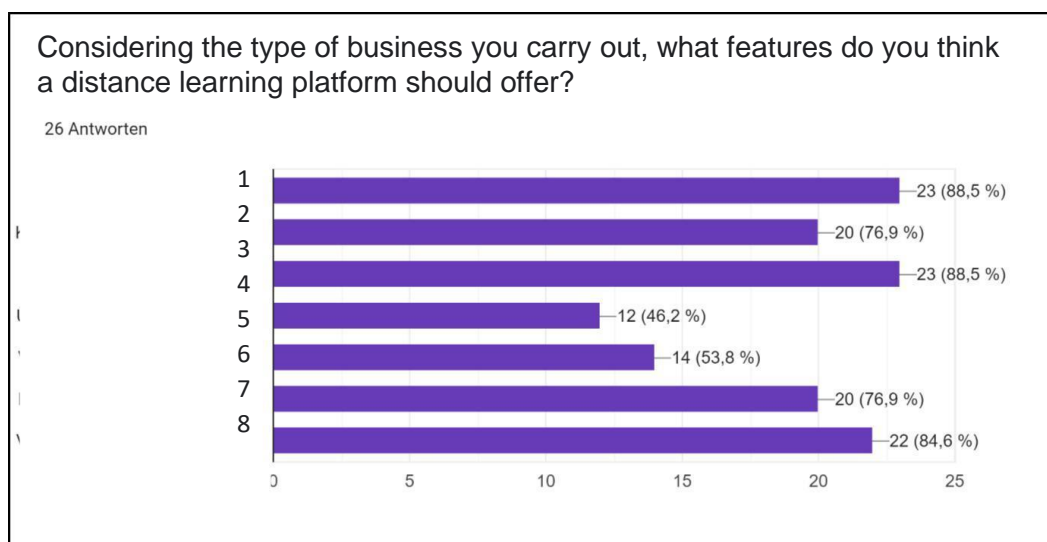


Figure 48 : Evaluation - Functions of a distance learning platform

Explanation	
1	Learning objects (e.g. videos, documents, presentations, tests, questionnaires, etc.)
2	Course management (e.g. : presentation mode with slides or documents)
3	Test or quiz for learning
4	Monitoring of training (e.g. : verification of access, permanence and use of contents by learners)
5	Live Lesson Management (e.g. : creation of integrated paths between e-learning and live lesson)
6	Discussion forum and interactive spaces (e.g. : chat)
7	Management of course documentation (e.g. : teaching and in-depth materials; other documentation, including administrative)
8	Other...

Number of responses: 26 from 27

The desired functions of a learning platform are shown in Figure 48. It can be seen that the functions to be selected were evenly desired by the participants of the survey. The main focus is on the provision of learning objects via videos, texts, presentations and the like, as well as the administration of these course materials. The checking of learning objectives by means of tests or quizzes is also an essential function.

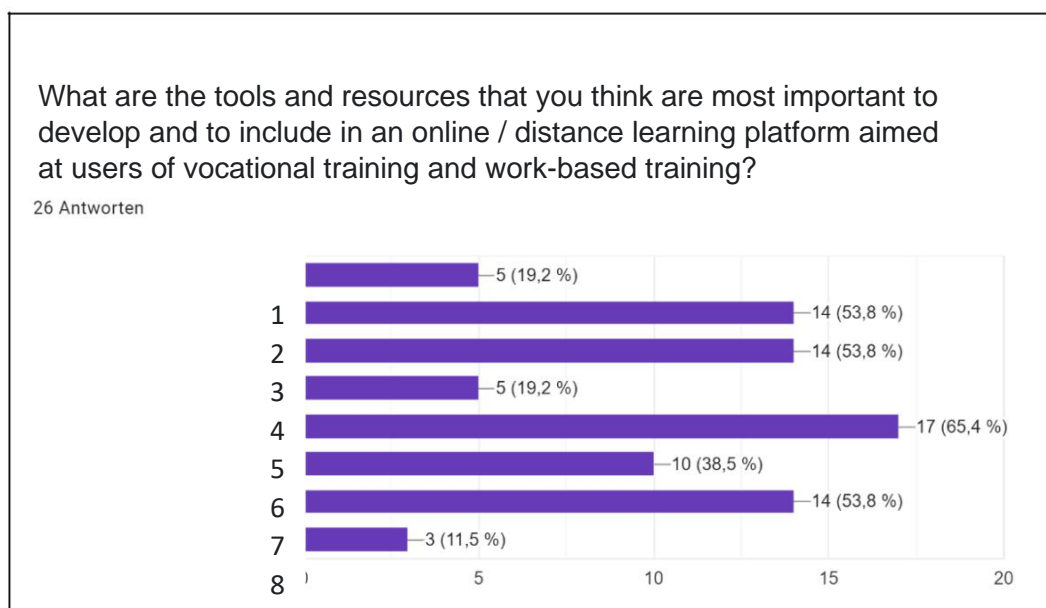


Figure 49 : Evaluation - Required resources and instruments

Explanation	
1	Simulators, virtual reality or augmented reality
2	Virtual learning environments
3	Blog and discussion forum
4	Podcasts
5	Video
6	Interaction with YouTube
7	Written resources (self-paced learning guides, learner notes)
8	I do not know

Number of responses: 26 from 27

If we look at Figure 49 the tools of a learning platform that provide videos and written resources for the transmission of content predominate. Communication between teachers and course participants is also an important functionality

Podcasts, simulation tools and virtual/augmented reality, on the contrary, are only desired by a smaller number of participants.

#### 4.5 AREA 3 - Target groups and different activities

In this section of the survey, the target groups for which the learning platforms are used and the area of instruction in which they are used were identified.

The aim is to determine where and in what form difficulties arise. Special attention was paid to teaching with learning platforms in practical classes. The question of which tools are used for this and where the difficulties lie in this form of practical work is to be clarified.

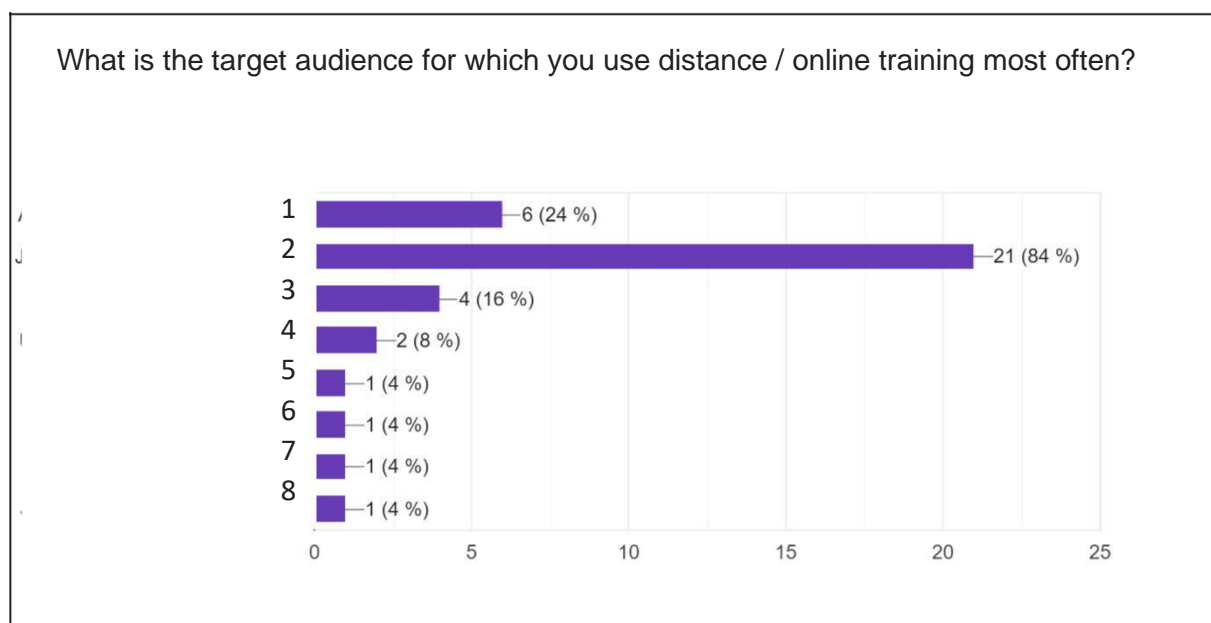


Figure 50 : Evaluation - Target Groups for Distance Learning

Explanation	
1	Unemployed young people (15-35 years), users of vocational training / work-based training courses
2	Young people (15-35 years) employed
3	Unemployed adults (over 35 years of age), users of training / retraining courses
4	Entrepreneurs or aspiring entrepreneurs
5	HTL students
6	Part-time students
7	Extra-occupational students
8	All different kind of workers/employees

Number of responses: 25 from 27

Figure 50 shows the distribution of target groups in which participants use learning platforms. The largest target group is young people in the 15-35 age group. The majority of this group is in employment. A non-negligible proportion is unemployed.

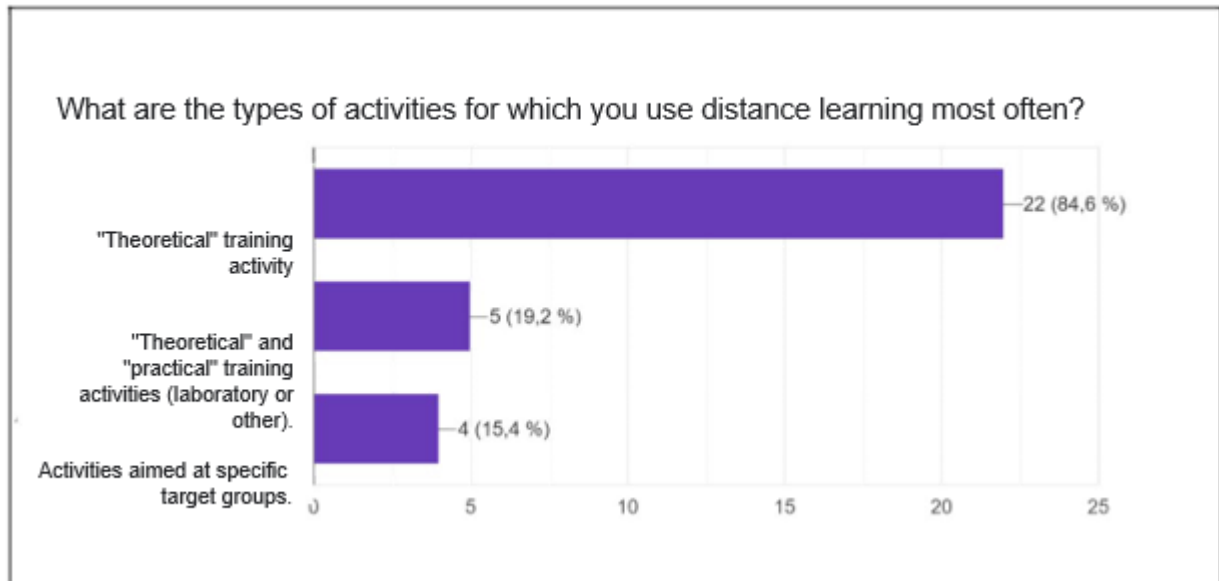
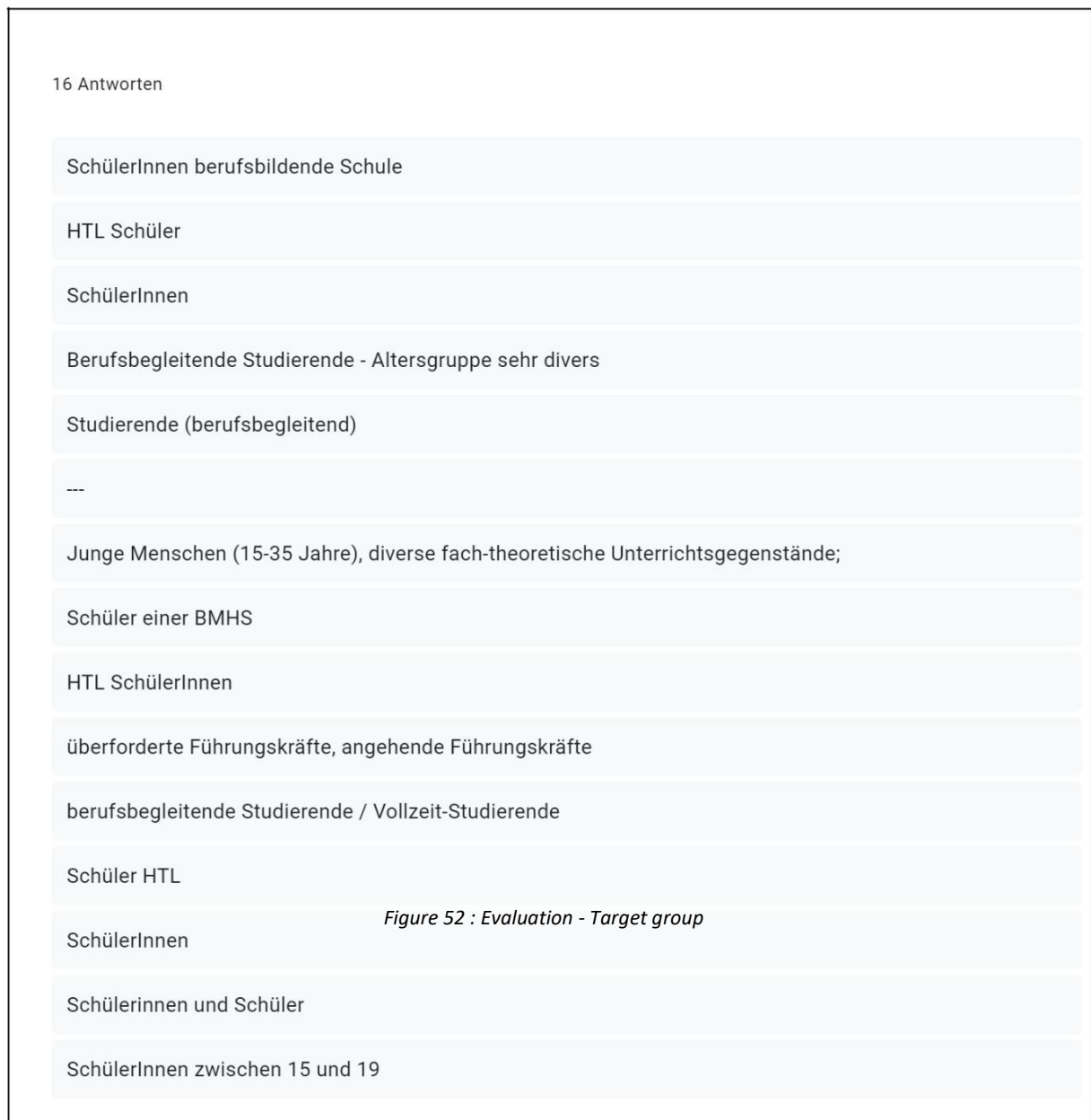


Figure 51 : Evaluation - Distance learning activities

Number of responses: 26 from 27

Looking at Figure 51 it can be seen that distance learning is mainly used for theoretical training. Only 5 participants also use it for practical training measures such as laboratory instruction.

Please specify the activity/target group



*Number of responses: 16 from 27*

The educational personnel for asked the fill out he target group of their training. In Figure 52 the entries are listed.

The most frequently mentioned target group is students at vocational schools and colleges. Students (full-time or part-time) were also mentioned several times.



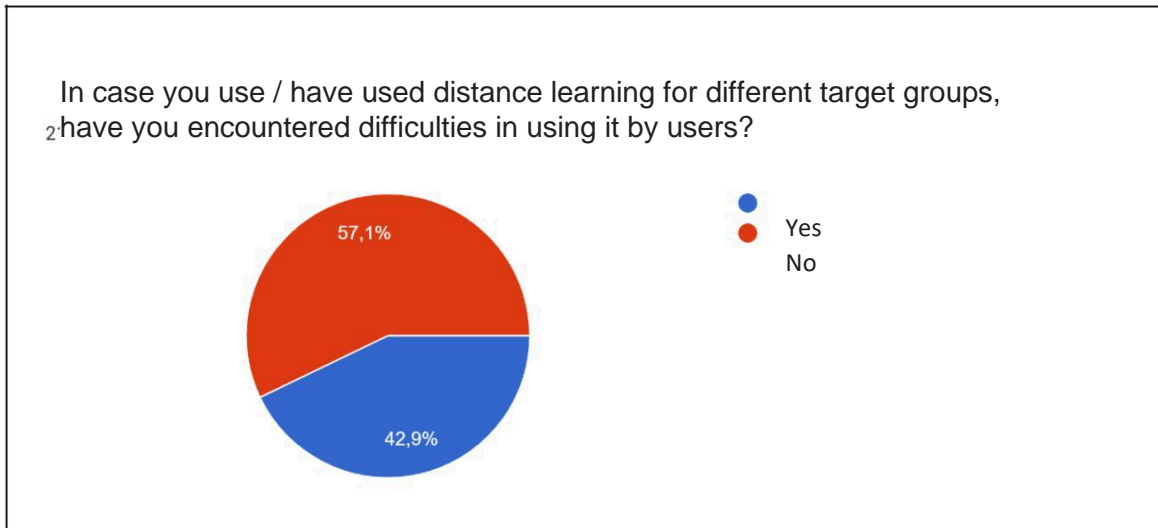


Figure 53 : Evaluation - Difficulties encountered by users

Number of responses: 21 from 27

The pie chart in Figure 53 shows how many of the participants in distance learning have encountered difficulties by the users. It can be seen that the use of learning platforms by the user did not work smoothly. 42.9% state that learners have encountered problems when using learning platforms.

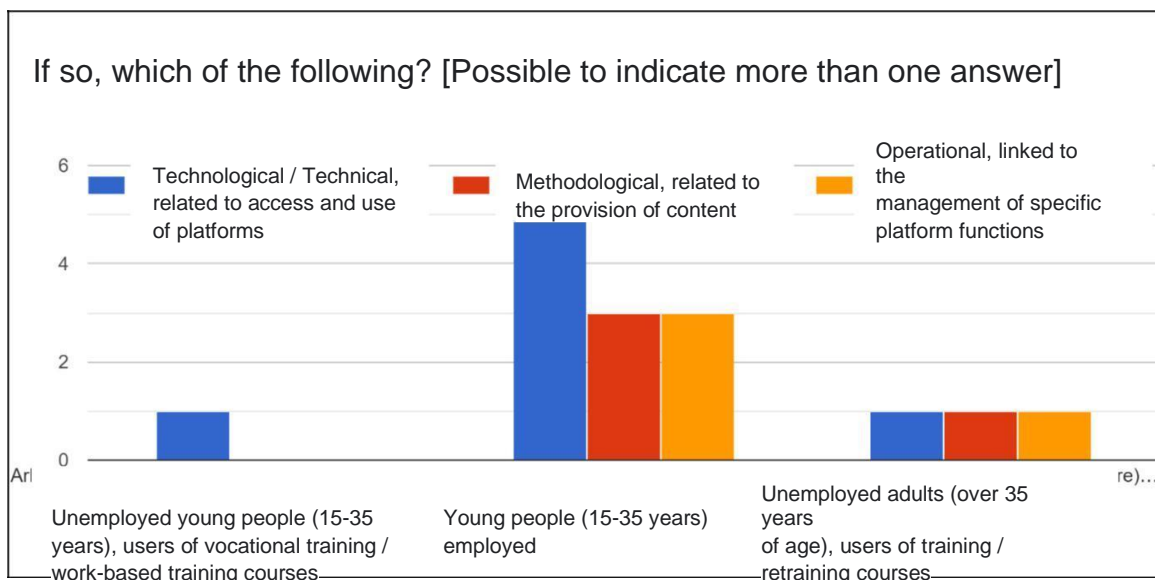


Figure 54 : Evaluation - Difficulties caused by users (details)

Number of responses: 15 from 27

In Figure 54 the difficulties encountered when using learning platforms are broken down into three categories: Technological, Methodological and Operational. For each of these categories, the number of

responses for the corresponding target group is shown. In the largest target group, young people in employment, technical or technological difficulties occur most frequently. These difficulties relate to access and use of platforms. Methodological or operational problems occur somewhat less frequently.

Due to the small size of the remaining target groups (see Figure 50), no statement can be made here.

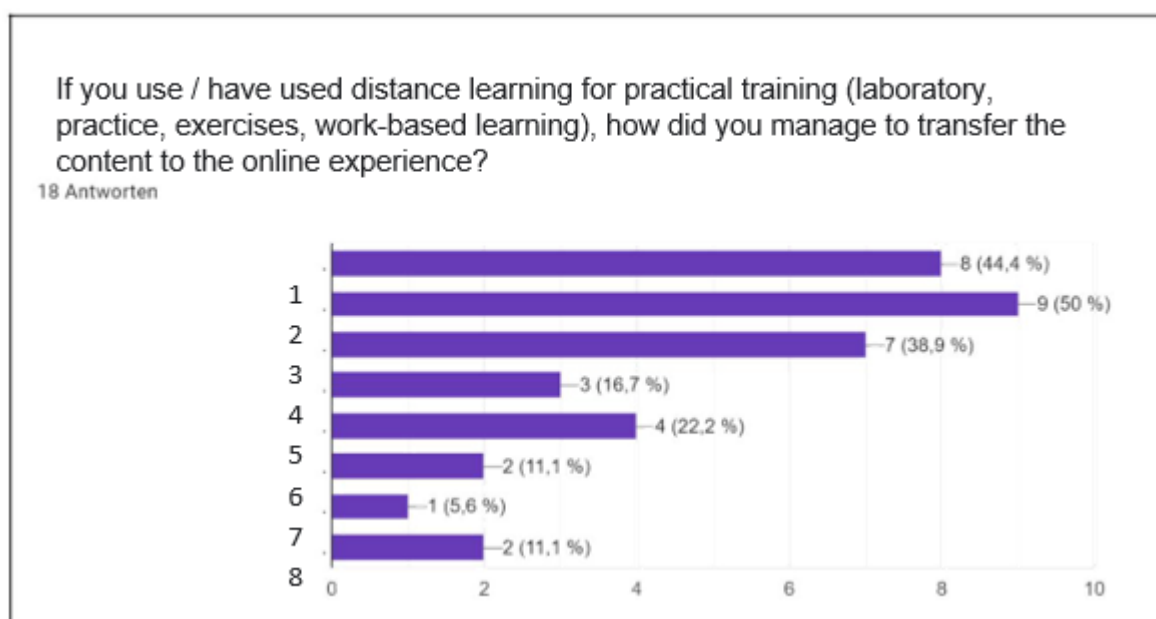


Figure 55 : Evaluation - Distance learning in practical training (contents)

#### Explanation

1	Video presentation (with or without comments)
2	Teacher's/trainer's story telling (only audio), Static presentation (text and images, commented by teacher/trainer), Video presentation (with or without comments)
3	Static presentation (text and images, commented by teacher/trainer), Video presentation (with or without comments)
4	Static presentation (text and images, commented by teacher/trainer)
5	Teacher's/trainer's story telling (only audio), Video presentation (with or without comments)
6	Teacher's/trainer's story telling (only audio), Static presentation (text and images, commented by teacher/trainer)
7	Teacher's/trainer's story telling (only audio)
8	None of the above

Number of responses: 18 from 27

Figure 55 shows a list of methods that enable participants to transfer the content of practical lessons to online lessons. Most of them use video presentations or explanations of the teachers on the audio track in addition to presentations, pictures or videos.

Only using audio, without the support of various media is carried out by very few respondents.

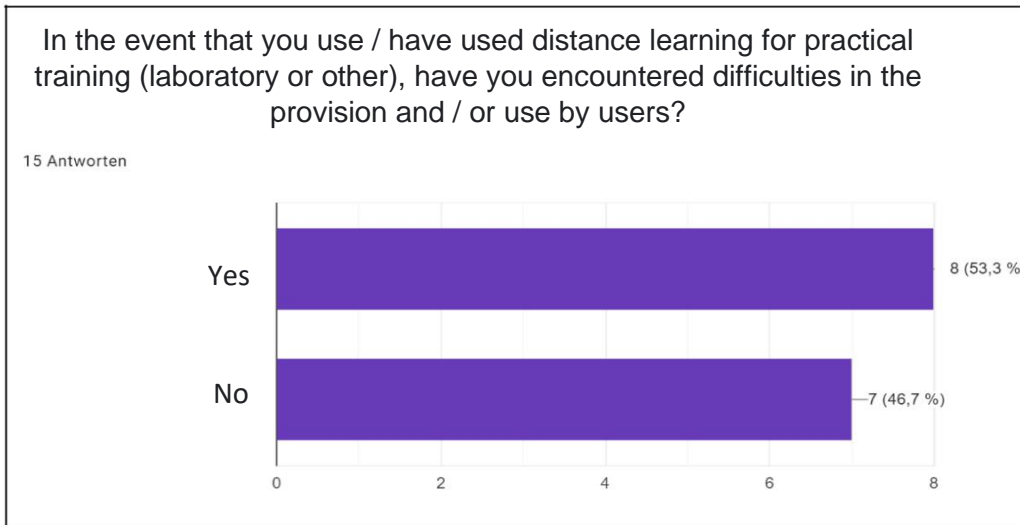


Figure 56 : Evaluation - Distance learning in practical training (Difficulties I)

Number of responses: 15 from 27

Similar to the general survey (see Figure 53), slightly less than half of the participants encountered difficulties with regard to practical training via distance learning, which you can see in Figure 56.

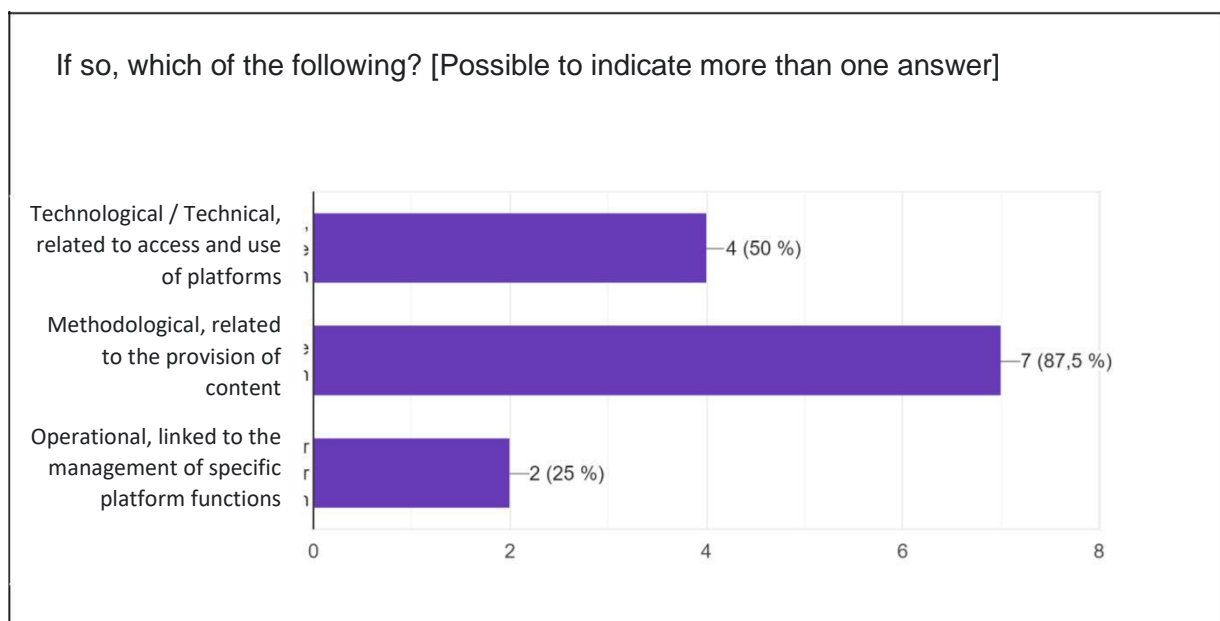


Figure 57 : Evaluation - Distance learning in practical training (Difficulties II)

Number of responses: 8 from 27

In Figure 57 it can be seen that most of the difficulties lie in the methodological area. The provision of content poses particular challenges for teachers in practical instruction. The technological difficulties take a back seat here compared to theory lessons.

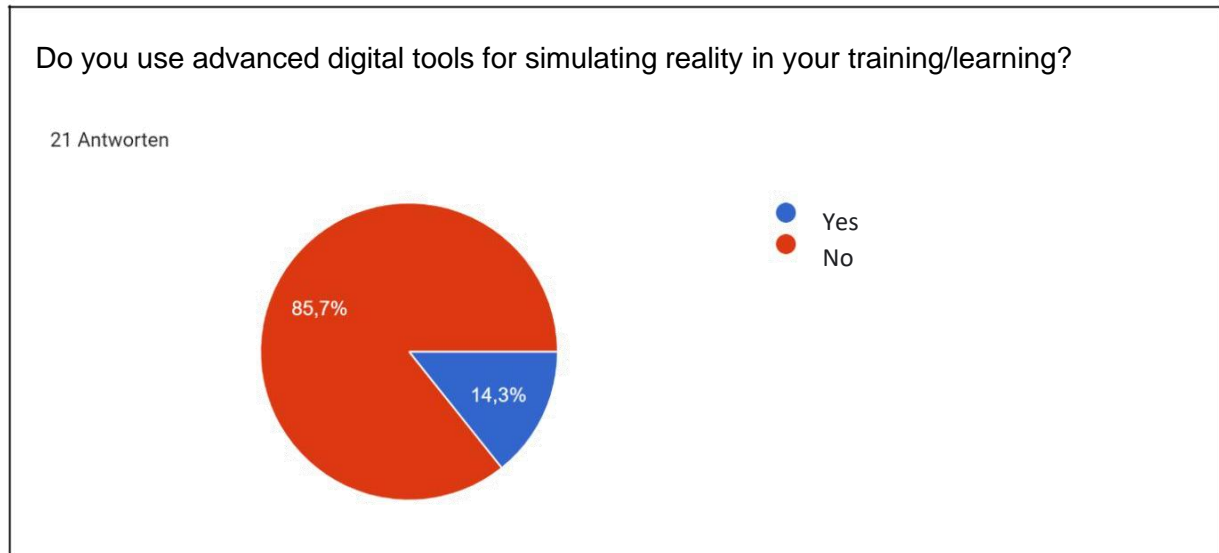


Figure 58 : Evaluation - digital simulation tools

Number of responses: 21 from 27

The question about the use of simulation tools was predominantly answered in the negative. As shown in Figure 58 only 14.3% of the participants use this feature.

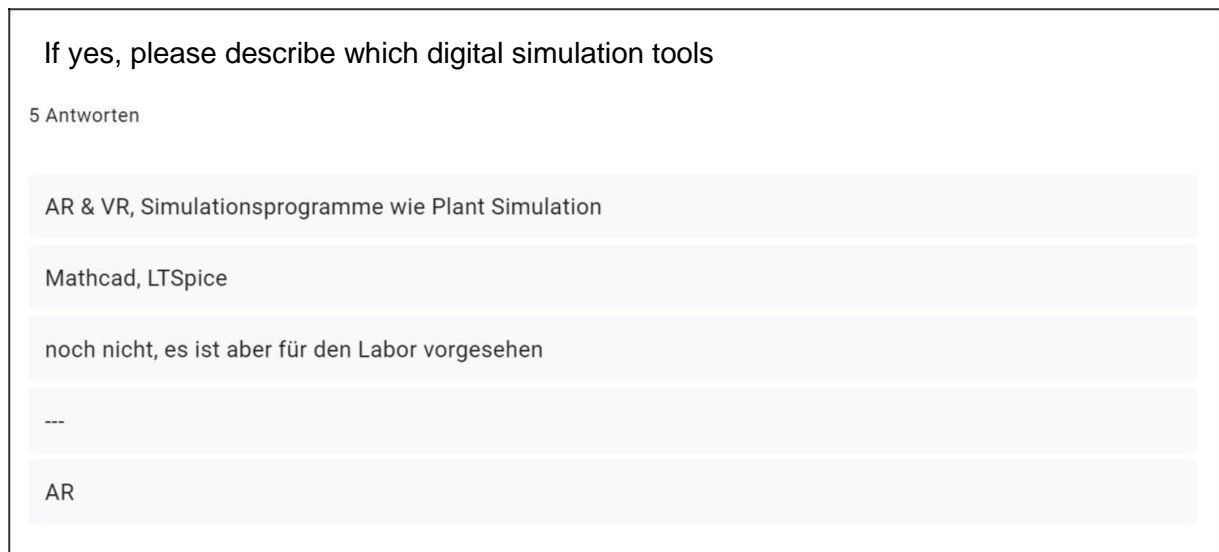


Figure 59 : Evaluation - digital simulation tools (listing)

Number of responses: 5 from 27

In Figure 59 the simulation tools are listed, which are used by the participants in the practical lessons via distance learning. These are mainly software for subject-specific teaching for the simulation of technical setups and systems, which can simulate a real laboratory setup for distance learning. Augmented reality and virtual reality were also mentioned.

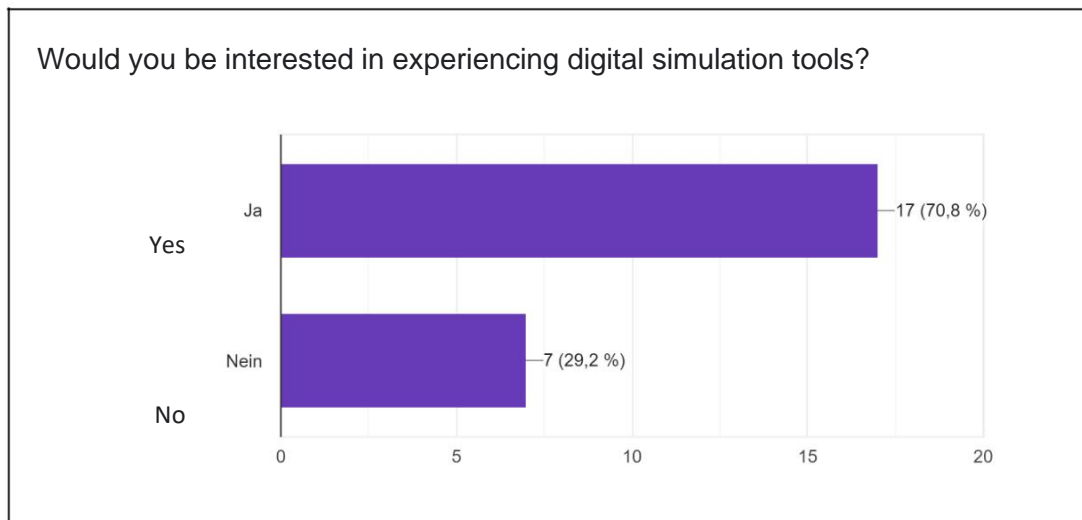


Figure 60 : Evaluation - Interest in simulation tools

Number of responses: 24 from 27

Most of the participants are interested in getting to know simulation tools (see Figure 60).

## 5. Verification of learning and effectiveness of the training path

Based on the answers of all participants of the focus group the individual marking is one of the most critical parts in terms of online / remote learning. Also, quizzes are not 100% useful and cannot evaluate the knowledge of the students. Additionally, the correction of the uploaded tasks is very time consuming. The face-to-face discussions of the mistakes are crucial for the learners and the teacher to get the best feedback. There is a big gap of knowledge when it comes to effective evaluation.

## 6. Advantages and disadvantages of distance learning

### Advantages

- Good for excellent students.
- Self-paced learning.
- Free time management.
- Eco Friendly, no emissions due to no paper, travel etc.

### Disadvantages

- Work based learning is not possible. There is no replacement to the real workshop.
- Lack of appropriate evaluation tools.
- No social interaction.
- Face-to Face feedback is missing.
- Quiet room is needed.
- High costs for infrastructure (computer, internet, wifi, touch pen...)
- Self-disciplined.
- Motivation sinks rapidly over the time.
- Time consuming to prepare the content

## 7. Conclusions and recommendations

- The infrastructure (computer, internet, quiet room...) differs from student to student and must be improved in order to increase the learning success
- During online courses the motivation sinks rapidly.
- Hard to find good content that is easy to modify.
- No proper evaluation tools are available.
- Courses should be like games.
- A mixture of online and face to face meeting is highly recommended.
- MS teams was used so far but is actually no learning platform.
- Automated exams correction could save a lot of time.
- Personalizing courses should be easier.
- Number of students makes a big difference in online teaching.
- Virtual machines would help for WBL.

- Collaboration for teachers should be easy (sharing content, exams, projects...)
- Virtual learning environment e.g. Metaverse
- The teachers are highly motivated