

DITMEP

Digital Tools for Manufacturing training and Education Programmes

Project number: 2020-1-DE02-KA226-VET-008289

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Project overview

In the context of current COVID-19 crisis Education and training systems are facing new challenges regarding online learning, for guaranteeing quality and inclusive digital capabilities. Modernisation and digital transformation of education is a main need at European level, and in particular for vocational education and training schemes in manufacturing sectors, based on face-to-face classes and workshops linked to industry.

In particular, **DITMEP** project will focus on risk prevention modules, within the manufacturing of composites training schemes. This sector is of high interest for different industrial sectors at EU level, thus aiming to reinforce skills training for the EU industry.

DITMEP project aims to improve manufacturing training, in particular Risk prevention courses, generating digital capabilities on the methodology (through e-learning, gamification and augmented reality experiences) for educators and trainees. This will support and help the transformation of manufacturing in this current COVID-19 situation.

The main objective of **DITMEP** was to provide an e-learning platform containing a complete modular training course in risk prevention. In addition, various playful learning approaches should be developed and an augmented reality application should be implemented. Finally, all content should be available in the languages of each consortium member (German, Spanish, Portuguese) in addition to English.

The **DITMEP** project receives funding under the [ERASMUS + programme](#) of the European Union.

Results of the project

In the field of occupational safety training, we have developed a modular training course on the Moodle platform, which consists of 2 blocks with a total of 8 units:

Block 1: General risks

- Unit 1: Basic concepts on safety and health
- Unit 2: General risks and their prevention
- Unit 3: Prevention and safety against COVID 19

Block 2: Specific risks in composite manufacturing

- Unit 4: Risks associated with workplaces and work surfaces
- Unit 5: Risks associated with work equipment
- Unit 6: Risks linked to the use of chemical products
- Unit 7: Personal protection elements (PPEs) and safety clothing
- Unit 8: Signposting a polyester workshop

The full training course is available in English, Spanish, German and Portuguese. The theoretical content can be studied directly on the Moodle platform or downloaded to local storage. The theoretical content on the Moodle platform is kept interactive, so that questions can be answered while reading.

ALS ERLEDIGT KENNZEICHNEN

EINLEITUNG 1 / 10

EINHEIT 3 **EINLEITUNG**

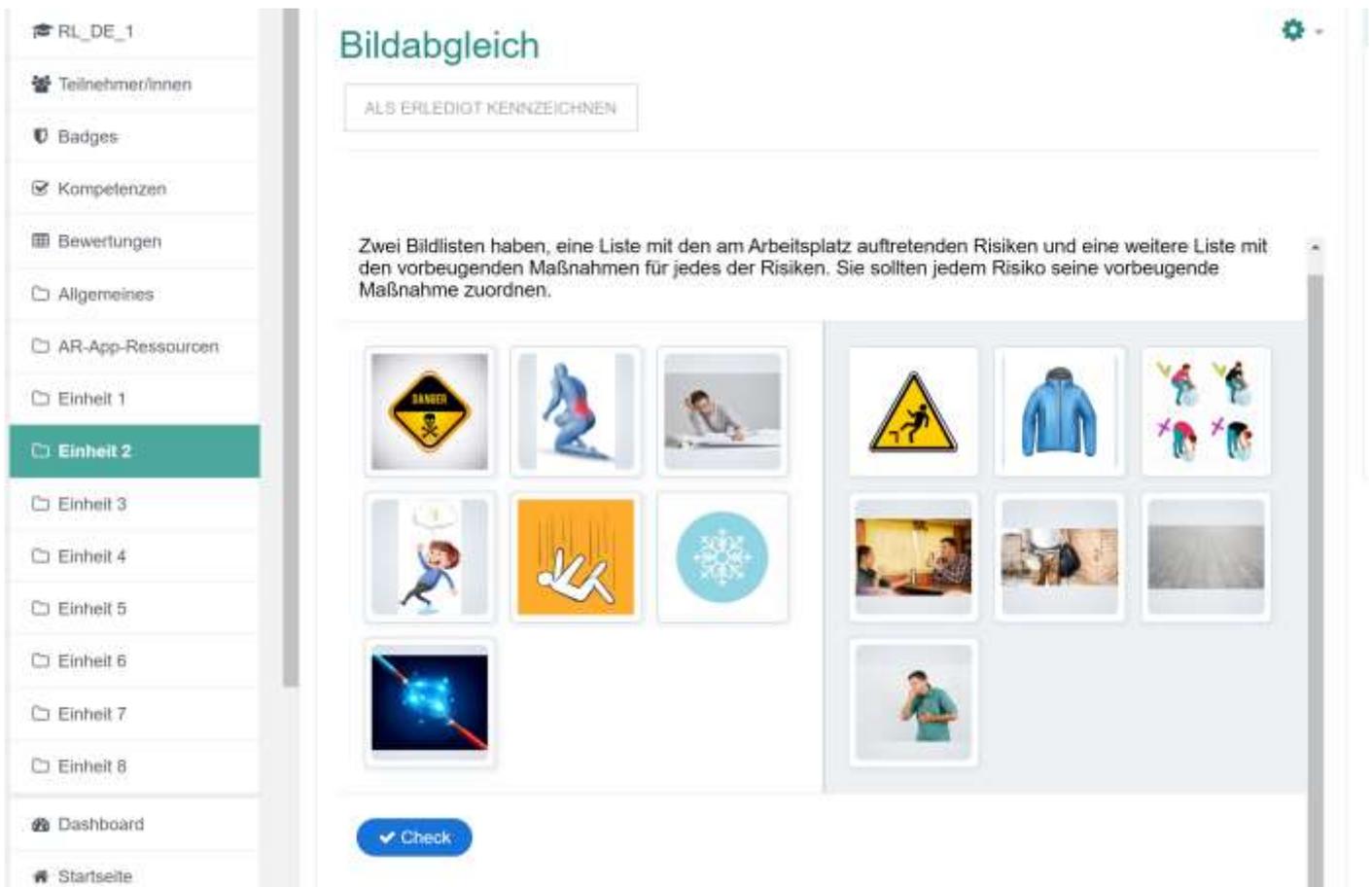
- ▼ EINLEITUNG ○
- ENLEITUNG
- ▶ RISIKO EINER L... ○
- ▶ VORBEUGENDE... ○
- ▶ BENUTZUNG EI... ○
- ▶ VORBEUGENDE... ○
- ▶ PROTOKOLLE F... ○
- ▶ COVID-19 UND ... ○
- ▶ ÜBUNG 1 ○
- ▶ ÜBUNG 2 ○

Zusammenfassung und Einsenden

Im Dezember 2019 wurde bei einer Gruppe von Menschen in Wuhan, China, eine atypische Lungenentzündung gemeldet. Ende desselben Monats litten bereits hundert Menschen an demselben Problem und Anfang 2020 traten die ersten Todesfälle durch diese bisher unbekannte Krankheit auf. Angesichts der unaufhaltsamen Zahl von Infektionen und der schnellen Übertragung hat die Weltgesundheitsorganisation (**WHO**) am 11. März 2020 eine Pandemiesituation aufgrund des SARS-CoV-2-Virus, besser bekannt als Covid-19, ausgerufen. Von diesem Moment an verfolgten die verschiedenen Länder verschiedene Strategien, um die Ausbreitung der Krankheit und den Zusammenbruch des Gesundheitssystems zu verhindern. In Deutschland wurde beispielsweise von März 2020 bis zum Juni 2020 ein Alarmzustand ausgerufen und ein sog. Lockdown beschlossen. Im Bildungsbereich wurde z.B. der Präsenzbetrieb untersagt. Dies stellte die Lehrer vor die Herausforderung, den jahrzehntlang durchgeführten Präsenzunterricht durch Online-Unterricht zu ersetzen. In bestimmten Unterrichtsformen, insbesondere in der beruflichen Bildung, die sich durch eine eminent praktische Komponente auszeichnet, war die Anpassung natürlich komplizierter. In einigen Fällen war es sogar unmöglich, da Aktivitäten wie die in Abbildung 1 zu Hause nicht durchzuführen sind.

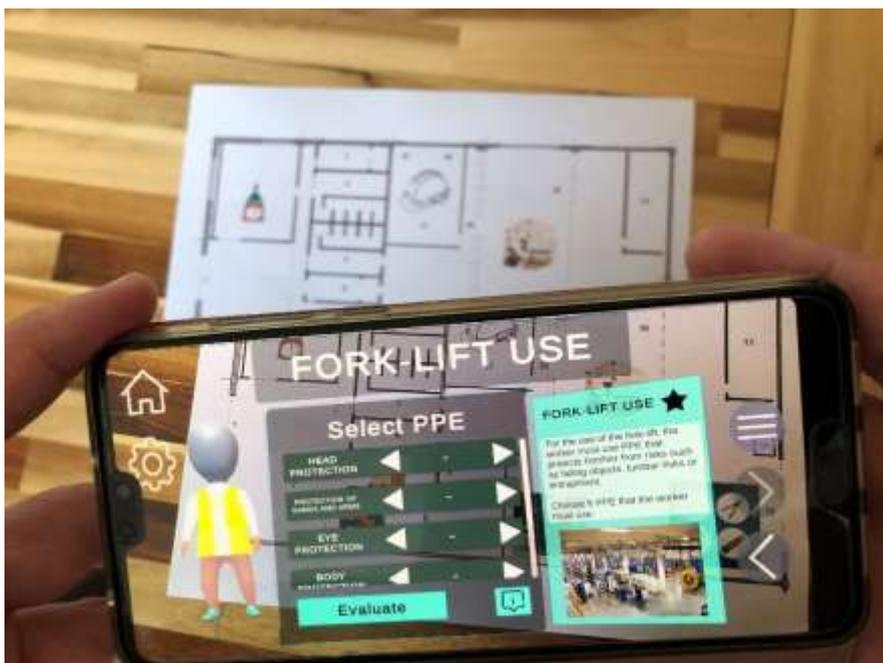


In addition to the theoretical content, there are various games and/or questions for each module, which can be used to test and deepen what has been learned.



In addition, each unit has an area where the teacher can upload further teaching material.

An augmented reality app was developed for units 7 and 8, which is available on Google PlayStore. In the "Personal Protective Equipment" area, the students have to choose the correct protective equipment in a fiber composite workshop, which must be worn in a specific area (e.g. in the warehouse or in the mixing area).



In the "Signage" section, select the appropriate signs that must be displayed at the entrance to a specific area.



In both scenarios, the app includes detailed explanations of all choices, so students can also learn the different pieces of personal protective equipment and the different signs through the app.

Both the entire online course on the Moodle platform and the augmented reality app are available in English, German, Spanish and Portuguese.

The augmented reality app requires at least the Android 12 operating system. Then the app is available via the following QR code.



If the end device has Android 11 or an earlier version, the app can be downloaded using the following QR code and must then be installed manually.



The entire online training course is available from the following link:

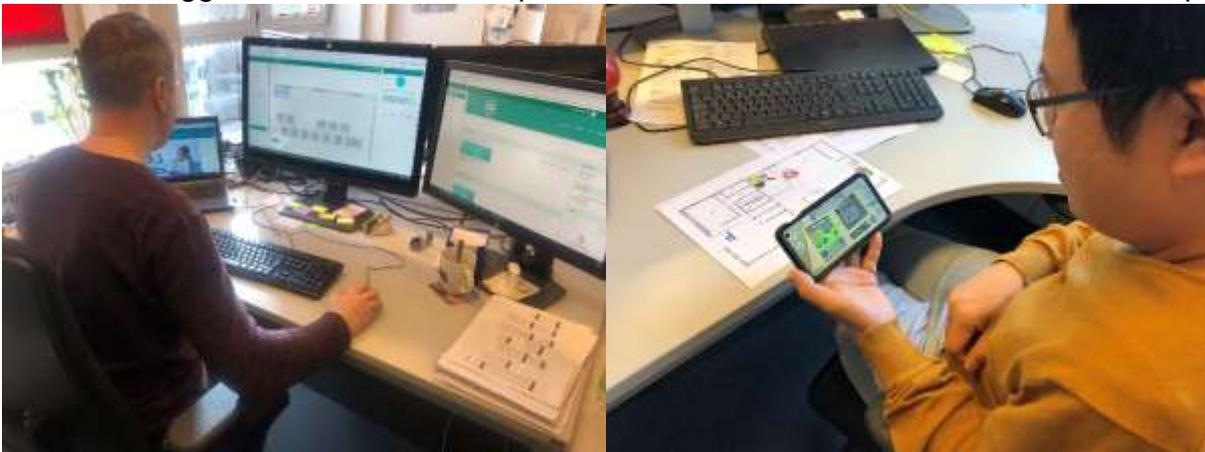
Pilot tests

After completion of the online learning platform and the augmented reality app, these were tested by some project partners as part of so-called pilot tests:

- CETMAR carried out the pilot test with students from the Axiola Training Center, which offers courses in wood, composite materials, electrical and mechanical installations, sails, pneumatics and fishing nets. The content was integrated into the existing courses. Students provided extensive feedback on the Moodle platform and AR app.



- RSC conducted the pilot test with 12 people. 2 people took on the role of a trainer and 10 people took on the role of a student. The participants came from the renewable energy sector. After the participants were familiar with the Moodle platform and the app, the participants could use both for several days. At the end of the week, experiences were exchanged and some suggestions for improvement and wishes were expressed.



- ISQ carried out the pilot test in two steps. First, a meeting was held with the trainers and some trainees to introduce the Moodle platform, the AR app and the many ways in which the learning units can be integrated into the existing courses. In the second step, the trainers integrated the materials into their planned course and played them through with their students.



Project meetings

Fourth transnational project meeting

Our fourth and last transnational project meeting as part of the **DITMEP** project took place on March 30th and 31st, 2023 in Hamburg at our project partner RSC. A month before the end of the project, all outstanding issues could be discussed here. Above all, this included how and in what way the results of our project will be made accessible to the public. Furthermore, the results of the first pilot tests were discussed and the responsible project partners explained how the feedback was integrated into the online training course and the app.

On the second day, the open points that still had to be completed by the end of the project were discussed. This includes above all administrative things such as project budget analysis, management and reporting. We ended the meeting with one of the most important points for European funded projects, the dissemination and exploitation of the results.



Final event und multiplier events

Final event in Husum, April 21, 2023

On April 21, 2023, the final conference took place at our project coordinator RSC in Husum. We were able to welcome more than 50 participants. After a short welcome by the managing director Franz-Josef Claes of Renewable Skills & Consultant GmbH, the project and its results were presented. In addition, Nils Ifsen from SkyWind GmbH from the area of rotor blade production for wind turbines and Erk Andresen from the area of safety training for wind turbines reported on their experiences from the pilot tests and also outlined the interest and benefits for their respective areas. The conference participants actively participated in the subsequent discussion and evaluation of our project, as the development results aroused great interest. At the end of the conference, the participants had the opportunity to visit a wind farm under construction and thus get to know an area for which the augmented reality app in particular, but also the training material, can be adapted.



Multiplier Events

A total of 3 multiplier events were carried out as part of the project. The first event took place in Spain on March 22, 2023 and we welcomed 31 participants. The second event took place in Portugal and the third and last multiplier event took place on April 14, 2023 in Kiel in the science center. We were able to welcome a total of 32 participants. The project in general and the training platform and the augmented reality app in particular were presented at all events.



Conclusions and Outlook

The experience of developing the project allowed to draw several conclusions:

- Since the individual project partners offer training at different levels, it was not easy to find a common learning level
- The start of the project during the corona pandemic, which made face-to-face meetings impossible in the first six months, led to certain teething problems
- The pilot experiences with the various project partners have shown that the training course has aroused great interest

In this sense, the possibility of continuing the work carried out both with the partners' own funds and with possible public support is considered. In this sense, the strategic approach for the future is based on the following points:

- Tracking the impact of using the DITMEP training course and AR app
- Possible expansion and adaptation of the AR app for other areas in which the topics of "personal protective equipment" and "signage" play a central role
- Assess the possible update of tools to track hardware and software progress in AR.

Dissemination and Exploitation of project results

All results are published on our project website www.ditmep.eu and are available for the next 5 years. If you have any questions or would like to have more information, you can still contact us at info@ditmep.eu. In addition, you can of course also contact the individual consortium members directly.

Project Consortium

Universities and training centres from three countries come together, to improve manufacturing learning, in particular Risk Prevention courses, generating digital capabilities on the methodology (through e-learning, gamification and augmented reality experiences) for educators and trainees.

Project Leader:

Renewable Skills & Consultant GmbH



Project partners



Web: www.ditmep.eu | Mail: info@ditmep.eu | LinkedIn: [DITMEP Erasmus+ Project](#)