



Pilot Training

Teaching Learning & Evaluation Methods

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Virtual and Augmented Reality (V&AR) in Design for Manufacture
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Pilot Training

Project Phase: IO 4 Evaluation and transferability guide, final guide book, digital materials and reports

- ✓ The activities to be held under the project include short term staff training and long term teaching activities.
- ✓ One of these activities include an international staff training courses will be held for total 10 participants from partners countries .
- ✓ The trainers who will participate in the short-term training activity that will used for the applications to be developed in the scope of the project in the pilot training activity.

Pilot Training

As stated in the project, 75 students are planned to participate these trainings from Turkey. Each course consist of 15 beneficiaries (revised 20 for minimum evaluation number).

Planned groups:

1. Vocational school Machine department students,
2. Vocational School Automotive department students,
3. Mechanical Engineering students,
4. Manufacturing Engineering, dual diploma students (revised as Electrical department),
5. Group Bosch (or Fiat) company workshop technicians.

Pilot Training- Fine Tuning (Feb. 2019 - Oct 2019)

- a. Training of first trainees group,
 - b. Evaluation of training groups in terms of trainees,
 - c. Focus on learners' evaluations and inputs,
 - d. Re-design of curriculum / materials,
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- ✓ The training path will be revised and re-designed according to the evaluation results.

 - ✓ The project intranet will be generated for facilities sharing and viewing documents and milestones.

 - ✓ All partners will be supplied with login details to access the intranet.

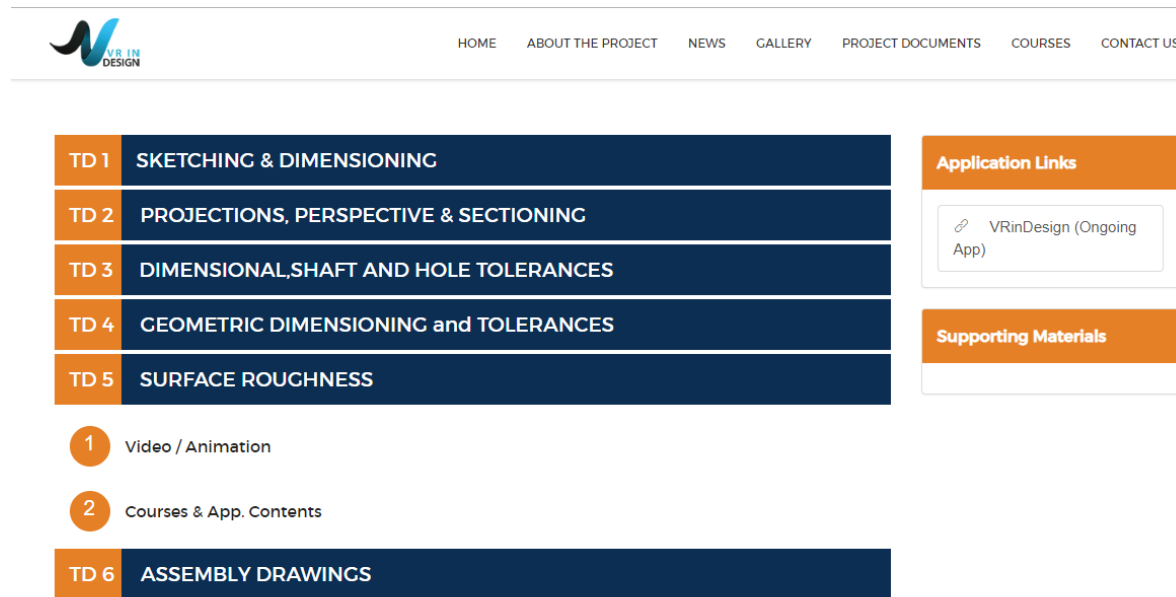
Pilot Training

- ✓ A guide book will be prepared for learners in Turkey and Europe.
- ✓ This book will contain curricula, training methods, time and supported materials.
- ✓ Digital materials will be also added this material. It will provide an efficient and productive education for learners.
- ✓ Interim & final reports will be prepared by UU with contribution by all the partners.

Teaching Learning Methods

Teaching Learning Methods

All users should be familiar with the content and use of the web page especially functions of Courses page. <http://vrindesign.org/>



The screenshot displays the VR IN DESIGN website interface. At the top left is the logo, and a navigation menu includes HOME, ABOUT THE PROJECT, NEWS, GALLERY, PROJECT DOCUMENTS, COURSES, and CONTACT US. The main content area features a vertical list of course topics (TD 1 to TD 5) on the left, a section for 'Application Links' on the right containing a link for 'VRinDesign (Ongoing App)', and a 'Supporting Materials' section below it. A numbered list (1, 2) is positioned between the course topics and the application links section.

TD 1	SKETCHING & DIMENSIONING
TD 2	PROJECTIONS, PERSPECTIVE & SECTIONING
TD 3	DIMENSIONAL, SHAFT AND HOLE TOLERANCES
TD 4	GEOMETRIC DIMENSIONING and TOLERANCES
TD 5	SURFACE ROUGHNESS

1 Video / Animation

2 Courses & App. Contents

TD 6	ASSEMBLY DRAWINGS
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Application Links

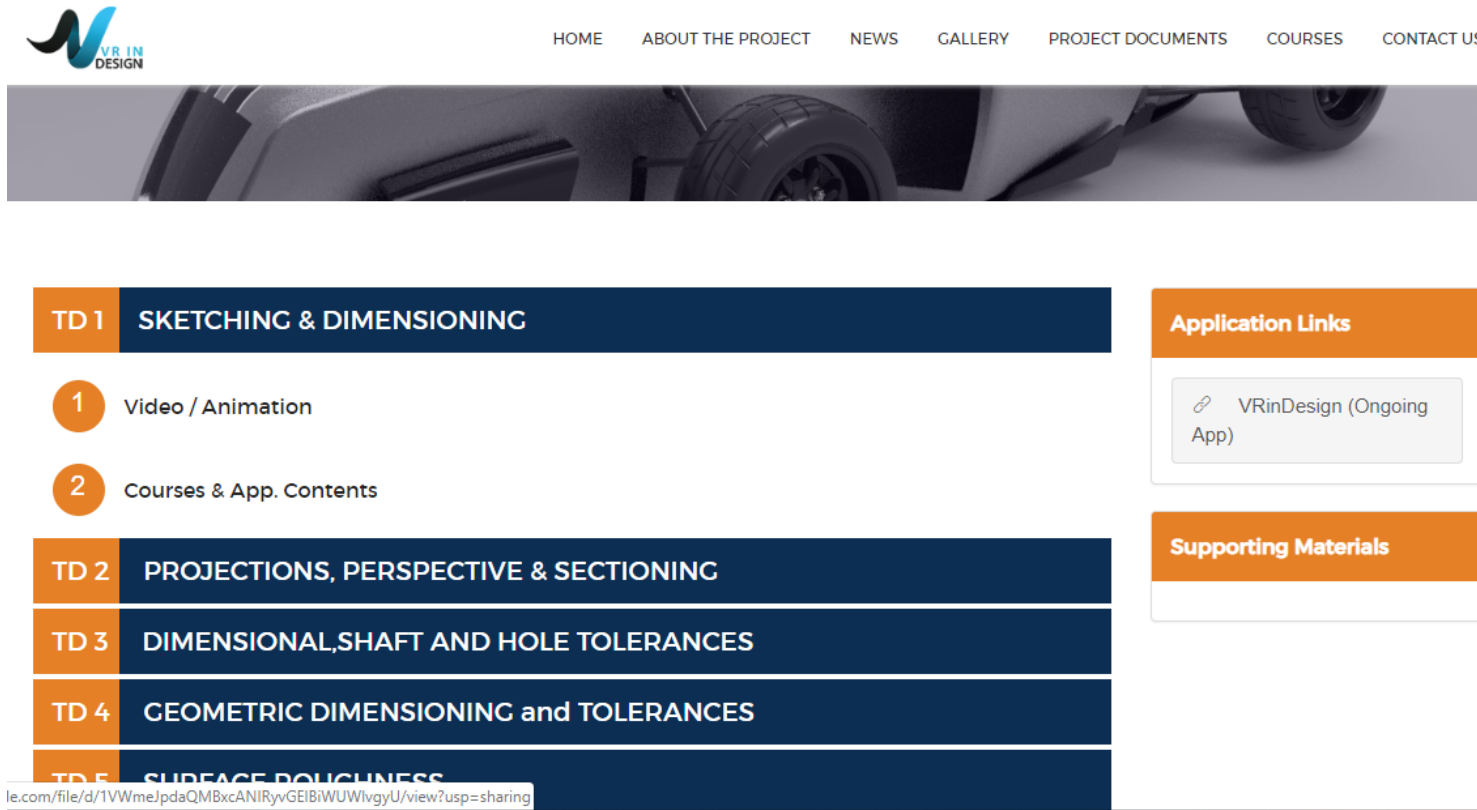
- [VRinDesign \(Ongoing App\)](#)

Supporting Materials

As it seen above; ongoing AR apk uploaded under apk links. It will be added VR apk too. It will be uploaded handbook, user manuals, etc, under supporting materials section. Also other supported materials will be uploaded there and continuously updated.

Teaching Learning Methods

All course [contents](#), user guide sections and Teaching/Learning methods for developed materials have been already uploaded to the project web site



The screenshot shows the VR IN DESIGN website. The navigation menu includes: HOME, ABOUT THE PROJECT, NEWS, GALLERY, PROJECT DOCUMENTS, COURSES, and CONTACT US. Below the menu is a banner image of a car wheel. The main content area features a list of teaching documents (TD 1 to TD 5) and two side panels: 'Application Links' and 'Supporting Materials'.

VR IN DESIGN

HOME ABOUT THE PROJECT NEWS GALLERY PROJECT DOCUMENTS COURSES CONTACT US

TD 1 SKETCHING & DIMENSIONING

- 1 Video / Animation
- 2 Courses & App. Contents

TD 2 PROJECTIONS, PERSPECTIVE & SECTIONING

TD 3 DIMENSIONAL, SHAFT AND HOLE TOLERANCES

TD 4 GEOMETRIC DIMENSIONING and TOLERANCES

TD 5 SURFACE ROUGHNESS

Application Links

- [VRinDesign \(Ongoing App\)](#)

Supporting Materials

le.com/file/d/1VWmeJpdaQMBxcANIRyvGEIBiWUWlvgyU/view?usp=sharing

Teaching Methods for Trainers

These applications and animations will be used as supporting materials during theoretical lecture to teach the course content.

Suggested methods are:

- Use general PowerPoint slides to teach theoretical content,
- Use/show videos or animations where the related subject presentation to visualization to enhance trainees understanding of subjects,
- These techniques may be use directly on web page or web links may be added lecturer's slides

Teaching Methods for Trainers

- Learners can use their own mobile device to use AR/VR apps to create interactive scenarios for the subjects in 3D environment,



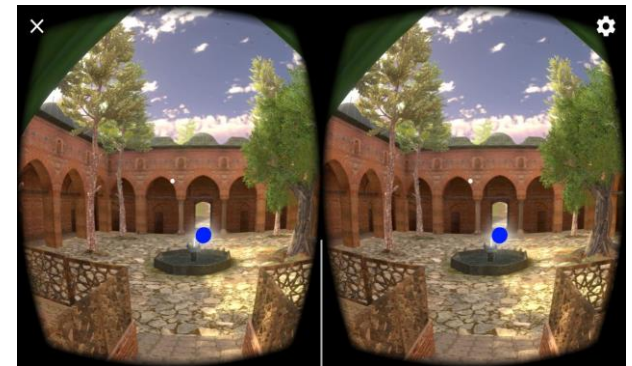
- Or use AR apps via projections to show to visualise complex contents in 3D interactively to the learners,

Teaching Methods for Trainers

- Learners or trainers can use VR apps via HTC vive with the learners to understand related subject where relevant hardware and computers are available,



- Also VR apps to practice with using VR glasses, cardboard headset and mobilephone



Learning Methods for Individual Users

- Firstly users check and read user manual / handbook to understand how to use contents given on the website including, AR/VR Apps, Animations, documents,
- Users watch related videos or animations/ visualisations and understand basis of the subjects,
- Learners use their AR apps to practice these subjects in 3D environment interactively,
- Users has options to use their own mobile devices to see related Animations, VR apps to practice these subjects in 3D environment with and without VR glasses,

Evaluation Methods

Evaluation Methods

Evaluation Methods

Pre-Experimental One Group Pre-test-Post-test Design
has been suggested to evaluate
the influence of a variable of pilot training outcomes.

One group pre-test post-test design

- Compare same subjects before and after treatment
- No randomization, No control group

Group of Participants Assigned to Only One Group

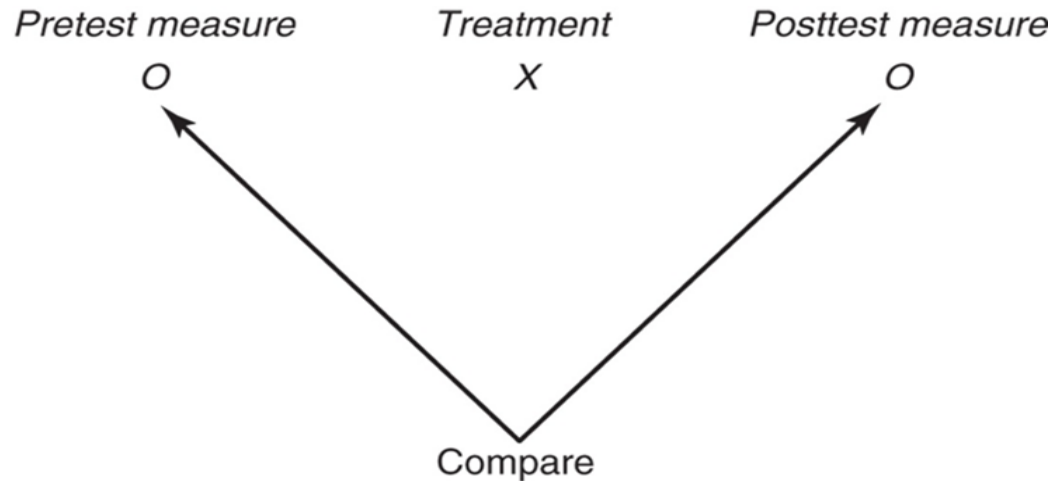
Pretest

Treatment

Post-Test

- ✓ Observations are made before and after the IV has been administered to the group
- ✓ better than one shot case study
- ✓ statistics: parametric t-test for correlated samples; nonparametric sign test
- ✓ May be carried out in an intact or existing class
- ✓ Many other variables (apart from the independent variable of interest) could play a role in influencing any findings
- ✓ Good as or recommended as a pilot study

One group pre-test post-test design



Example

O = students reading and understanding of technical drawings measured at beginning of the course,

X = new reading curriculum employed throughout course,

O = students' reading and understanding of technical drawings measured at the end of the course,

One group pre-test post-test design

- ✓ We will organize 20 students for each test group.
- ✓ Course hours will be minimum 12 hours,
- ✓ We are planning to have either 2*6 or 3*4 or 4*3 or similar sessions, depending on the training requirements of the participating companies and institutions (for example companies may prefer 1 or 2 days to complete their staff training)
- ✓ 2 or 3 interviews will be done with minimum 3 students
- ✓ Derya Emreli, a Research Assistant from the Uludağ University will organize the data collection of pre-post test surveys and the data generated in March 2019.
- ✓ Evaluations will be completed in May.

Thanks