A Solution to Laboratory Applications During the COVID-19 Pandemic Period:

YÖK Virtual Laboratory Project (YÖK SanLab)

Prof. Dr. Naci Gündoğan
the Council of Higher Education (YÖK)
Council of Higher Education (YÖK)

- is autonomous and constitutional body, responsible for
  - Planning
  - Governing
  - Auditing
  of whole Higher Education System in Turkey
- consists of 21 members
Council of Higher Education

14 Members appointed by the President of Turkey for a period of 4 years

7 Members elected by Inter-University Board for a period of 4 years

Executive Board
9 Members elected among the members of the Board
HE in Turkey at a Glance

Turkish Higher Education System (2020)

- Number of HEIs: 209
- Number of Students: 8,076,615
  - Male: 4,189,480
  - Female: 3,887,135
- Number of Faculty Members: 86,176
- Number of Academic Staff: 174,494
  - Male: 95,807
  - Female: 78,687

Second Largest Country within EHEA
in terms of Student Numbers
HE in Turkey at a Glance

The Number of Programs in Turkish Higher Education System

In Total 58.092
YÖK started the ‘Digital Transformation Project’ to support universities with limited infrastructure and expertise to transition to distance learning.

- Learning and Teaching in Higher Education in the Digital Age
- Digital Literacy
On 11.06.2020, “Virtual Laboratory Project” was launched at the meeting organized by YÖK and TÜBİTAK senior executives.

24 academicians from 11 universities and 12 experts from TÜBİTAK work in the project.

32 meetings have been held in 6 and half months.

As the studies continue, it is aimed to complete 14 experiments in Chemistry and 10 in Physics by the end of February 2021.
Laboratory Courses:
- General Chemistry
- General Physics
  in
- Science Faculties
- Engineering Faculties
- Vocational Schools
Prof. Dr. Cem Sevik
Eskişehir Teknik University

Prof. Dr. Alphan Sennaroğlu
Koç University

Prof. Dr. Alper Kiraz
Koç University

Prof. Dr. Emre Gür
Atatürk University

Doç. Dr. Cemal Parlak
Ege University

Dr. Nazmi Yılmaz
Koç University

Prof. Dr. Mustafa Şenyel
Eskişehir Teknik University

Dr. Özgür Girgin
İstanbul Teknik University
DISTANCE EDUCATION TEAM

Prof. Dr. Cengiz Hakan Aydın
Anadolu University

Doç. Dr. Evrim Genç Kumtepe
Anadolu University

Doç. Dr. Yasin Özarslan
Yaşar University

Doç. Dr. Özlem Ozan Özarslan
Yaşar University

Doç. Dr. Hasan Çalışkan
Anadolu University

Doç. Dr. İrfan Sural
Osmangazi University

Abdullah Saykılı
Anadolu University
UNIVERSITIES WITHIN THE PROJECT

• Ardahan University
• Artvin Çoruh University
• Bingöl University
• Bitlis Eren University
• Bursa Teknik University
• Erzurum Teknik University
• Eskişehir Teknik University
• Gümüşhane University
• Hakkari University
• Hitit University
• Iğdır University
• Konya Teknik University
• Munzur University
• Muş Alparslan University
• Siirt University
• Şırnak University
• Tokat Gaziosmanpaşa University
• Yozgat Bozok University

YÖK Virtual Laboratories are employed by 15 thousands students at 18 universities.
- Trainings were provided to the operators in 18 universities.
- Trainings were provided to the faculty members (211 academicians).
In the universities where 2020 YÖK Virtual Laboratory would be implemented, trainings were provided to:

- the operators
- the faculty members
VIRTUAL LABORATORY IMPLEMENTATION

- Teaching
- Experiment
- Evaluation
Each experiment includes lecture video and Pdf file. Students watch the video before starting the experiment.

Before the laboratory study, a questionnaire with yes/no questions is implemented to evaluate the student’s competence and knowledge.

At the end of the experiment, the student is asked “open-ended” questions. After answering these questions, the student uploads them into the system. The folders of the students having answered the questions are sent to the faculty staff who is responsible for the course.
Free Learning
Students are free at Virtual-Labs. They recognise their mistakes and have opportunity to repeat the experiment.

Simultaneous Learning
While students are conducting the experiments, there is flow of audial/textual/anymatic information.

First watch-Than Apply
Students conduct experiments step by step on their own.

Evaluation
Students are evaluated through open-ended questions following the experiments.
Mechanics

Experiment 1: Measurement and Measurement Error (Simple Pendulum)
Experiment 2: Linear Motion
Experiment 3: Inclined Plane
Experiment 4: Projectile Motion
Experiment 5: Friction
Experiment 6: Collisions
Experiment 7: Centrifugal Force and Acceleration
Experiment 8: Torque, Parallel and Non-Parallel Forces
Experiment 9: Simple and Coupled Pendulum
Experiment 10: Hook’s Law and Simple Harmonic Motion
Electricity and Magnetism

Experiment 1: Ohm’s Law – Voltage and Current Measurements
Experiment 2: Electric Field Lines
Experiment 3: Capacitances
Experiment 4: Kirchhoff’s Law
Experiment 5: Wheatstone Bridge
Experiment 6: Lorentz Force
Experiment 7: RC and RL Circuits
Experiment 8: Serial Alternating Current Circuits
Experiment 9: Transformers
Experiment 10: Magnetic Field Sources
Experiment 1: An Introduction: Working with Laboratory Equipment and Laboratory Safety Rules

Experiment 2: Identification of Chemical Substances by Their Properties

Experiment 3: Purification of Compounds by Crystallization and Distillation

Experiment 4: Stochiometric Calculations

Experiment 5: Titration of a Strong Base with a Strong Acid

Experiment 6: Determination of the Solubility of a Salt

Experiment 7: Determination of Ferrous Ion in Acidic Solutions with Permanganate Titrant

Experiment 8: Buffer Solutions, Buffer Capacity and Buffer Range

Experiment 9: Investigation of Gas Diffusion Phenomena

Experiment 10: Preparation of Soap

Experiment 11: Molecular Weight Determination from Freezing Point Depression (Cryoscopy)

Experiment 12: Catalysts for H₂ production

Experiment 13: Termochemistry: Determination of the Heat Reaction
APPLICATION OF STUDENT SYSTEM

YÖK Sanal Laboratuvarları

Bu site Üniversitelerin Fizik ve Kimya laboratuvar derslerinin sanal olarak çevrimiçi gerçekleştirilmelerini sağlamak için hazırlanmıştır.

E-DEVLET İLE GİRİŞ YAP

Bu site genel kullanım için hazırlanmamıştır. Bu uygulamayı kullanacakların üniversitelerde idari, akademik yetkili veya öğrenci statüsünde bulunması ve uygulamada tanımlanmış görevleri olması, önceden bu görevler konusunda bilgilendirilmiş olmaları veya uygulamaya davet edilmeleri gerekmektedir.
YÖK VIRTUAL LABORATORY APPLICATION EXAMPLES
Genel Kimya Laboratuvarında Kullanılan Malzemeler

Bunchen Beki
Basit Damıtma

56 °C

6 mL
Thank You for Attention!

Prof. Dr. Naci Gündoğan

Executive Board Member
Council of Higher Education

nacigundogan@yok.gov.tr