Korean TVET Case: Interactive and Differentiated E-Learning Using Emerging Technologies

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KOREATECH

행복한 대한민국을 여는 정부3.0
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고용노동부
OLEI 한국기술교육대학교 온라인평생교육원

INDEX

1. Online Lifelong Education Institute(OLEI), KOREATECH

Hub of Online Vocational Training for Workers

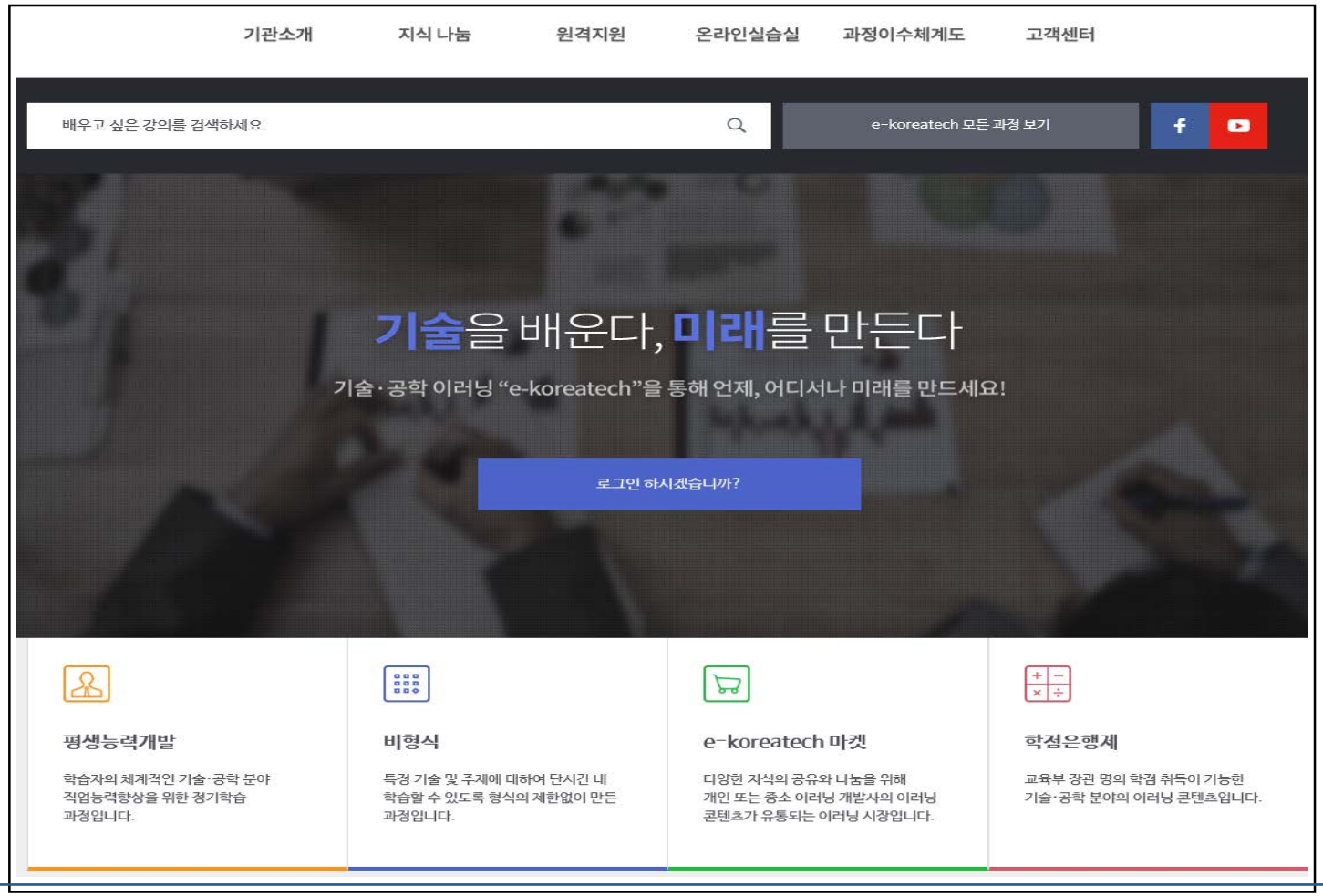
- Funded by Korean Ministry of Employment & Labor
- Has developed 238 free online courses in IT & Engineering, and provided them to current workers and job seekers
- Has contracts with 180 small & medium-size companies, offering e-learning courses tailored for each of them
- Disseminates some online learning contents to individual vocational training centers

1. Online Lifelong Education Institute(OLEI), KOREATECH

- **"e-koreatech" Portal Webite (http://www.e-koreatech.ac.kr)**
  - Launched in April, 2015
  - Areas : Mechanics, Electronics, Mechatronics, ICT, Design, Materials, Architecture, Chemistry, Job Basics & Core
  - Types : Certificate course(6-week), Non-certificate course, College credit course, E-Marketplace
  - Approx. 70,000 enrolled students & 730,000 visitors(Year 2015)
  - 25% course completion rates on average

1. Online Lifelong Education Institute(OLEI), KOREATECH

- “e-koreatech” Portal Website (http://www.e-koreatech.ac.kr)



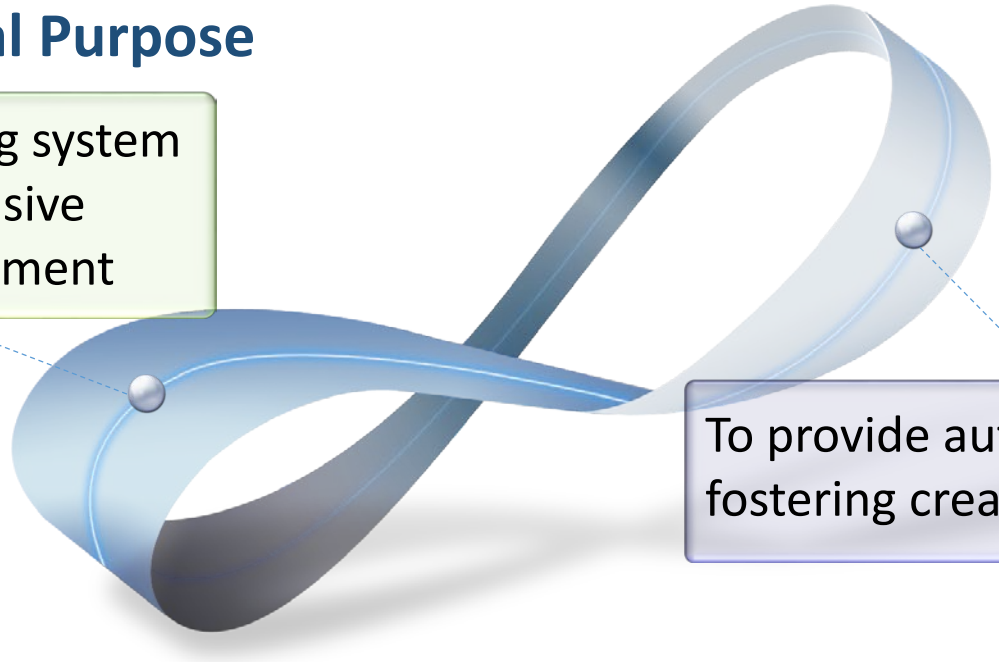
2. Virtual Training(VT)

Definition

Teaching in virtual learning environments for special needs of training – i.e., for practicing to manage special industrial equipment or hazardous work situations

Educational Purpose

To build learning system replacing expensive high-tech equipment



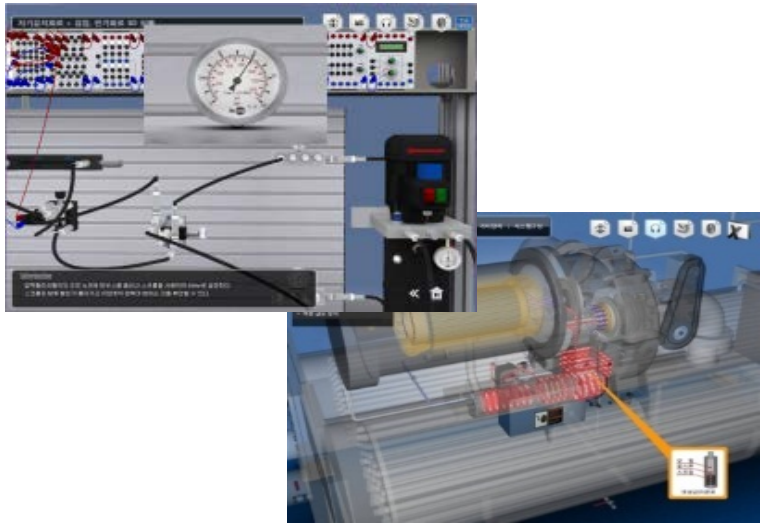
To provide authentic training for fostering creative technicians

2. Virtual Training(VT)

Benefits of VT

Real Training Environment

Virtual Training Environment



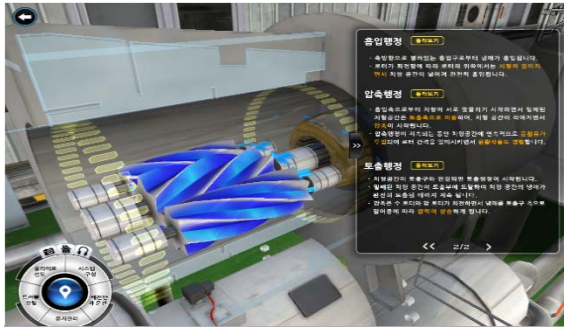
- Difficult to have costly and macro-size equipment
- Limited place to practice
- Unable to disassemble & reassemble equipment
- Difficult to train about emergent work situations

- Replace costly & macro-size real equipment
- Able to do online practices on networks
- Able to disassemble & reassemble equipment
- Able to train about dangerous work situations

2. Virtual Training(VT)

Types of VT Contents

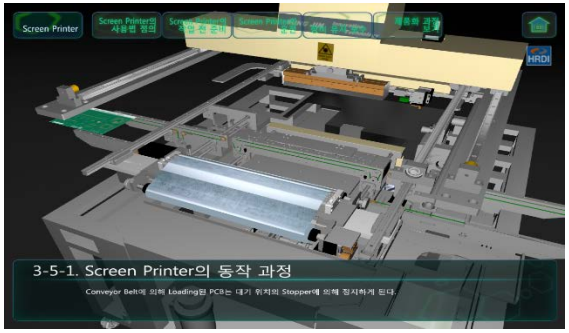
Component



- Understand the inner structure of equipment
- Disassemble the parts of equipment

- Turbo Refrigerator
- Hybrid Automobile
- Clean Diesel Automobile
- Wind Generator System

Scenario



- Operate equipment following a scenario
- Learn about the procedure of operating equipment

- Absorptive Water System
- Concrete Construction
- SMT In-Line System
- Solar Battery Manufacture Process

Practice

- Practice equipment operation to produce various results
- Change the conditions of practice for users' needs

- EHC Survo Control
- Siemens PLC
- Proportional Hydraulic Control
- Semiconductor Manufacturing

2. Virtual Training(VT)

Dissemination of VT Contents

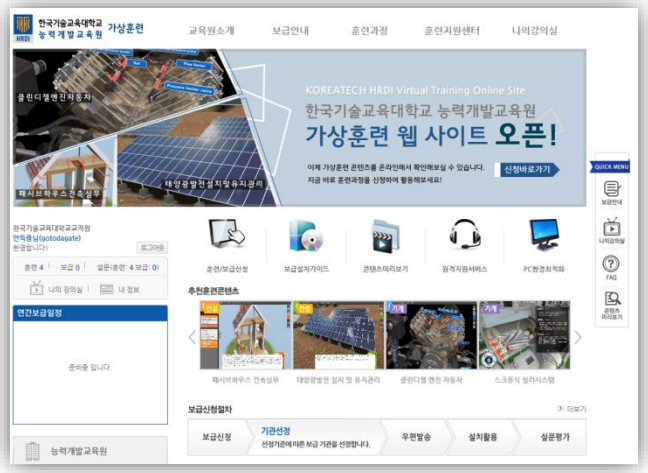
- Has developed 31 VT contents since 2007
- Has offered them to 141 public or private training centers including TVET colleges and Meister/specialized high schools
- Has taught 24,418 students at the training centers

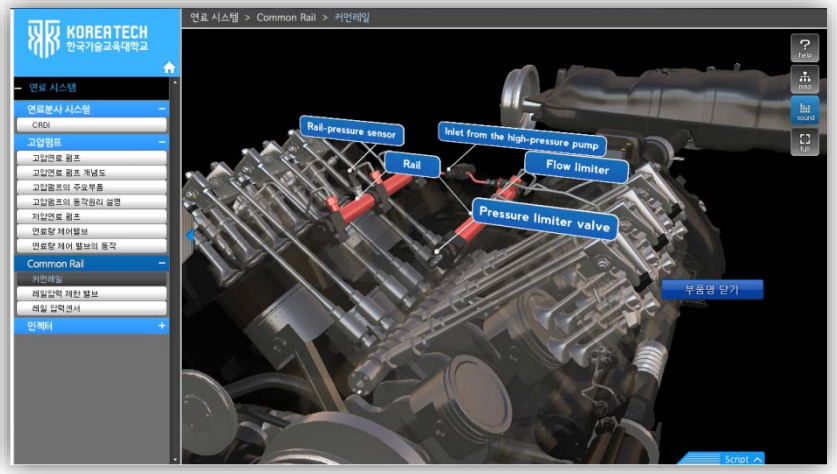
2012학년도 가상훈련 콘텐츠 기증협약식


가상훈련 콘텐츠를 활용한 실험실습교육

2. Virtual Training(VT)

Online VT Platform





- VT homepage available : http://vt.e-koreatech.ac.kr
- 8 VT courses available for online study
- 20 VT courses applicable for use with accompanied technologies

2. Virtual Training(VT)

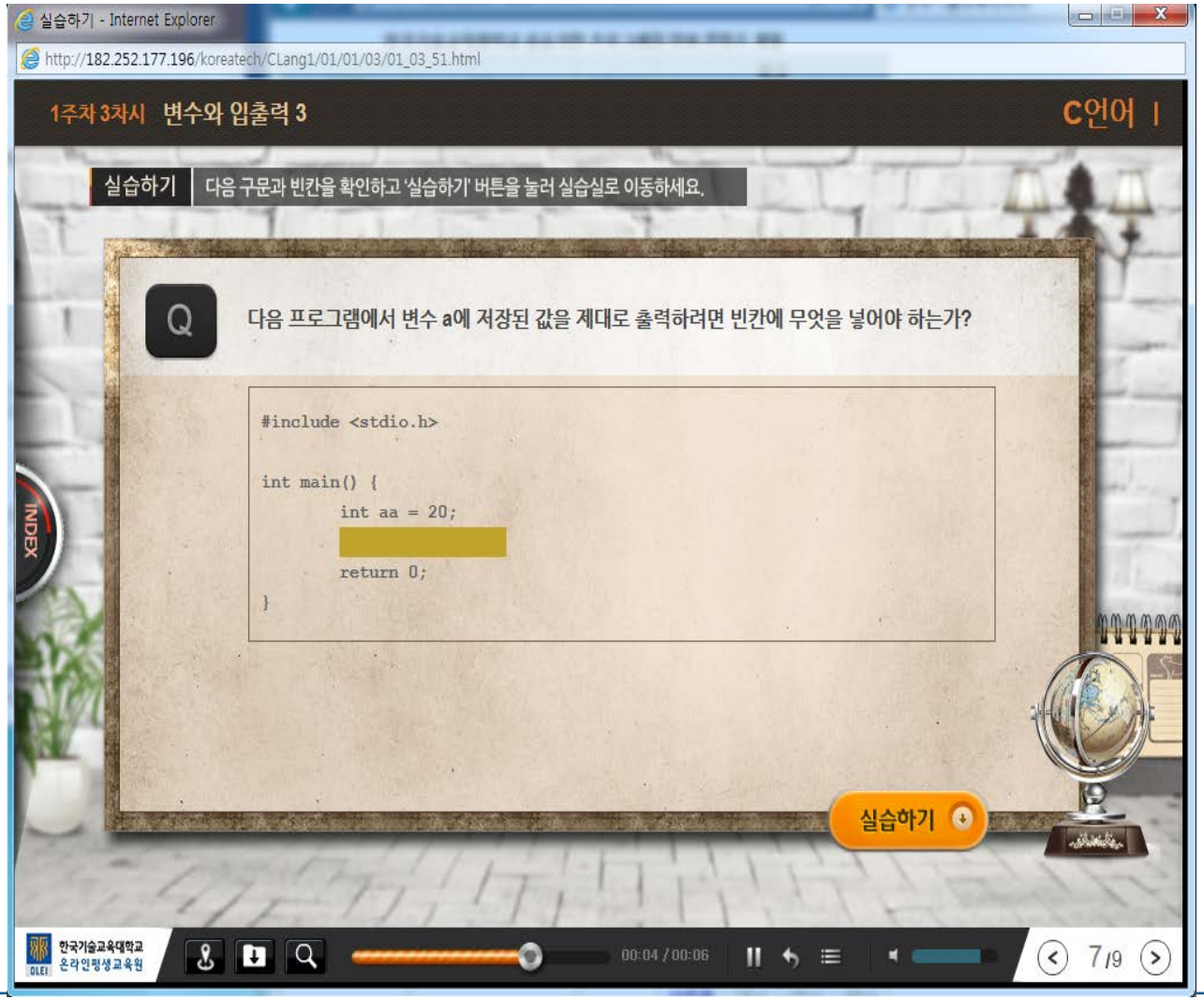
Outcomes of VT

- Reduced national vocational training costs
- Averaged out 4.45 points in user satisfaction survey

Questions	Average(points)	Year 2013	Year 2014	Year 2015
Total	**4.45**	**4.42**	**4.64**	**4.31**
Study prompts	4.69	4.82	4.77	4.48
Educational effects of contents	4.63	4.65	4.73	4.52
Adequacy of the content amount	4.19	4.05	4.38	4.14
Relevancy to real work	4.40	4.27	4.75	4.19
Differentiation from other media	4.58	4.52	4.84	4.38
User convenience	4.50	4.46	4.67	4.38
Replacement of real equipment	4.19	4.16	4.31	4.10

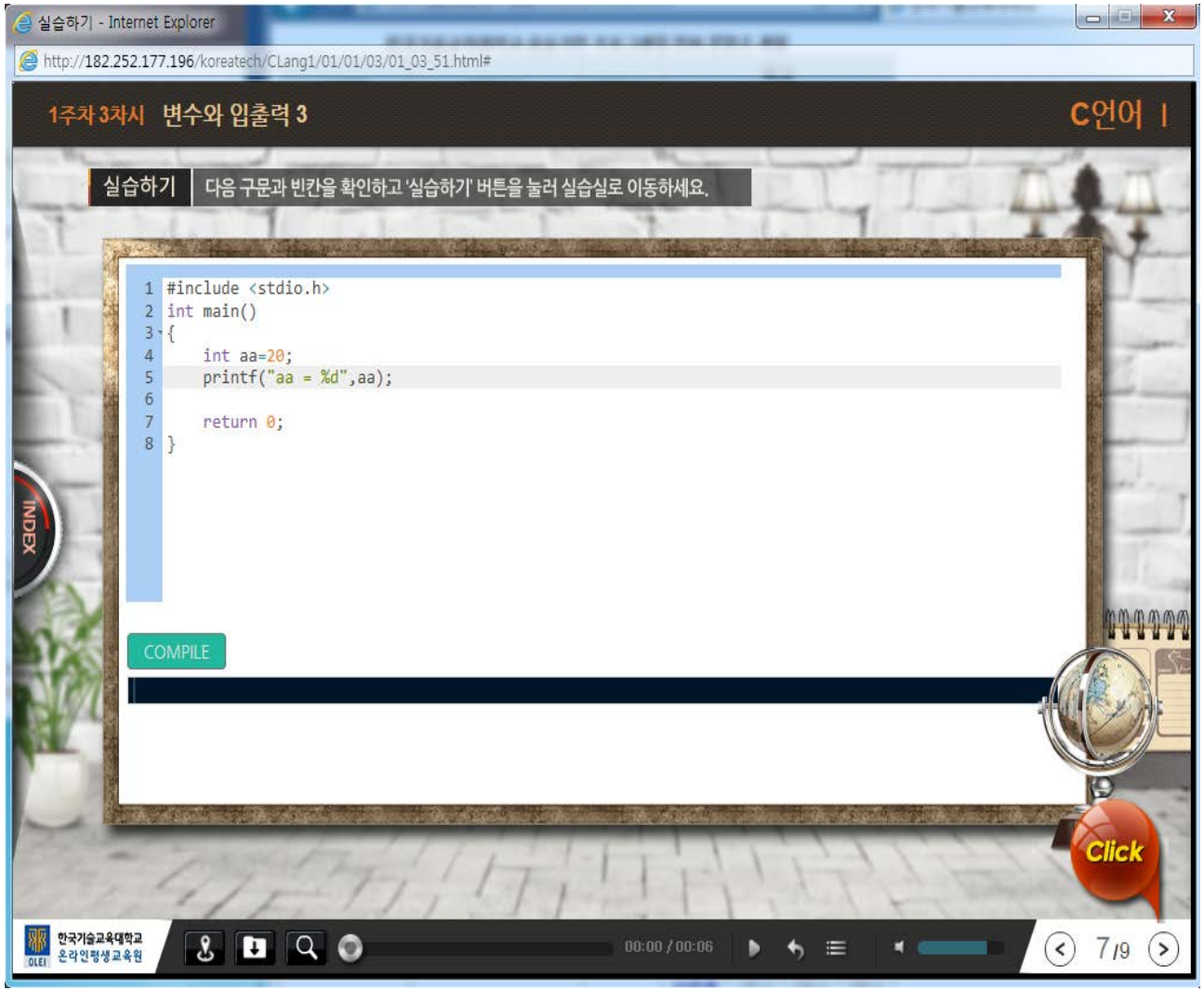
3. Online Practice Lab(OPL) for Computer Programming

- Available to C, C++, Python, Java & HTML Programming courses
- Provides practice problems pulled out of a test bank



3. Online Practice Lab(OPL) for Computer Programming

- Renders a coding editor for practicing to write program
- Runs a complier (or interpreter)
- Checks grammatical errors for two trials



3. Online Practice Lab(OPL) for Computer Programming

- Provides both the instructor's given answer on the left and the learner's input on the right

3. Online Practice Lab(OPL) for Computer Programming

- Shows both compiling results of the instructor's and learner's codes

3. Online Practice Lab(OPL) for Computer Programming

Benefits of OPL

- Renders a convenient and efficient programming environment
- Enables students to practice programming anytime they want
- Promotes instructors to design interactive web-based programming courses
- Easy to implement problem solving activities
- Allows the instructor to give immediate feedback to individual students' works

4. “Smart Training” as a New Trend

Definition of Smart Training

- Not simply deploying mobile devices
- Creative use of emerging technologies or incorporation of effective instructional strategies
- Provides differentiated learning adjusted to individual students in order to enhance the training effects
- Has students engaged in collaborative knowledge construction and diverse learning activities

4. “Smart Training” as a New Trend

2016 Smart Training Test-Bed Project

- Plays the role of test bed for implementing smart training, coordinated with Korean Skills Quality Authority(KSQA)
- Develops & Implements courses with special instructional designs focusing on:
  - Competency-based practices from novice to advanced
  - Activation of a community of practice
  - Thematic webinars for mentoring
- Research on the educational benefits and problems/difficulties
- Recommend the key points for a successful implementation

5. In the Future

Research-based Institutional Management

- Continues to play the test-bed role for innovating online TVET
- Conducts learning analytics to know about students' online learning behaviors and to predict their course dropouts
- Provides e-learning services differentiated to individual learners
- Creates more interactive online learning environments/systems, by finding effective uses of emerging technologies
- Activate online communities of practice for vocational training
- Train teachers on the basis of program evaluation

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