A Case Study on Use of ICT for ODL in KNOU

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Outline

- Motivation
- ICT history and background
- ICT for KNOU ODL
- Demonstration
- Remarks
Innovative Use of ICT for Open and Distance Learning
Motivation

- Variety of Educational Demand
- Change of Paradigm in Distance Education
- Increase of Access to W.W.W.
- Enlargement of Educational Space
- Explore Various Levels in a Teaching – Learning System
- Standardization of m-contents
ICT Background in Korea

- National Basic Information System (mid-1980s)
- Virtual University Trial Project (1998)
- Cyber University Consortium (2001)
- m-Learning (2008)
- U-Learning
Progress of Adapting ICT in Education in Korea

- **Initial Infra. Stage**
  - 1996 ~ 2000
  - National Teaching-Learning Center · EDUNET

- **ICT Utilization Stage**
  - 2001 ~ 2003
  - Education Resources Sharing System

- **e-Learning Stage**
  - 2004 ~ 2005
  - HRD for knowledge based society
  - e-Learning Project

- **u-Learning Stage**
  - 2006 ~
  - u-Korea Lifelong Learning Society
  - m-Learning Project
  - Personal Mobile Device Tablet PC

- **Strategic Point**
  - 1PC per 25 Students
  - 1 PC per 7 Students
  - 1 PC per 5.5 Students
  - 2006 ~
<table>
<thead>
<tr>
<th>Year</th>
<th>Events</th>
</tr>
</thead>
</table>
| 1998 | - Starting e-Learning operating program  
          - Starting Korea Virtual Campus (KVC) |
| 2001 | - Establishment of e-Learning center  
          - Start of Graduate School  
          - Program (4 Departments) |
| 2002 | - Building of e-Learning hub site ‘E-Campus’  
          - Chairman Univ. of KVC |
| 2008 | - Building of m-Learning hub site ‘U-Campus’  
          - Chairman Univ. of KVC |
What is e-Learning?

e-Learning is **Just in Time Learning** with those components:

- Right Contents
- Right People
- Right time
- Right Place
Components of e-Learning

Technology
- LMS
- ASP/ESP
- Multimedia
- Training delivery methods
- Operation
- System
- Reference
- Service

Learners

Contents
- Row data
- Original Draft

Innovative Use of ICT for Open and Distance Learning
Characteristics of e-Learning

- personalized
- Assessment
- Interactive
- Effective (cost)
- Standard
- Motivation
Construction of e-Learning

- Video clip
- Text
- Audio clip
- Flash
- Imported Document
- GVA Author
- HTML

Data Formation Based on DTD

Student Contents
- Construction of Contents based on Time Line
- Management of object based contents
- Personalized Contents
- Reusable and Just in Time Assembly
e-Learning: Learner’s Capabilities

Cognitive Capability

Relational Capability

Emotional Capability

Adaptability

Technology Literacy

Effective Learning Capability

Source: Kwon et al. (2006). u-Learning Roadmap.KERIS
Innovative Use of ICT for Open and Distance Learning

Learning

whenever

wherever

everyone

fun

Study ? Learning ? Edutainment?
Future e-Learning

Learner oriented education

Active Interactivity education

Continuing & Lifelong Education

Media based distance education

⇒ Just in Time ⇒ Just For Me

Innovative Use of ICT for Open and Distance Learning
Syllabus

Target Learner
- Introductory Course for the students majoring in statistics
- Non-statistician who needs to learn the basic concept of Introductory Statistics

Objectives
- To understand basic concepts of statistics
- To analyze real data in daily life
- To learn how to use a statistical package

Contents
- 10 Chapters accordance with the textbook
- 20 frames for each chapter (excluding video files, Java applets, and episodes of statistics)
Composition of Contents

Tutorial mode e-Learning contents

- Online Lecture
- Dynamic Flash
- Story of Statistics
- JAVA Practice
- CATS
- S-Link
- e-Book
- Online Test
Main Window of Statistics Contents.

Dynamic Flash
8.2 Simple Linear Regression Analysis

The **regression analysis** is a statistical method to find a mathematical model which represents the relation of the variables. The model is estimated by using the sample observations. It is used to explain the relation of the variables and to predict a value of the dependent variable.

If there are two variables which are linearly related and one of them is considered as the independent variable, it is called as the simple linear regression model. We usually denote the independent variable by \( X \), the dependent variable by \( Y \) and the observation of the two variables by \( (x_i, y_i) \). If there are more than one independent variable and the relation between the dependent variable and the independent variables are linear, it is called the multiple linear regression model.

### 8.2.1 Simple Linear Regression Model

The **simple linear regression analysis** is a mathematical model which includes single independent variable as follows:

\[
Y = \alpha + \beta X
\]

This model has a linear regression equation of the independent variable \( X \) with two unknown parameters, intercept \( \alpha \) and slope \( \beta \), which should be estimated. The \( \alpha \) and \( \beta \) are called the regression coefficients and Figure 8-5 shows their meaning.
Online test for evaluation

1. Which one of the following is a correct interpretation of the scatter plot between the cosmetic price and its sales? (2005)

   a. There is no significant relation between the price and its sales.
   b. There is a negative correlation and the sales is decreasing if the price is higher.
   c. There is a positive correlation and the sales is increasing if the price is higher.
   d. Two types of data are mixed and there is a positive correlation.

2. The Size (unit Pyong) of a house and its price (unit 10,000won) have the following regression equation.
On-line Lecture

1. Correlation Analysis

We can start off by defining a word, “Correlation Analysis.” It is to analyze the relationship between two variables statistically when they are correlated to one another, i.e., they are depended each other.

Then, let’s talk about the procedure of the correlation analysis. 1. After witnessing the scatter plot of the two variables, 2. with that, we can come up with a single measure, the correlation coefficient, which represents the strength of the relationship. 3. then we do a hypothesis test for the correlation coefficient.

Let us think about examples which can be the objects of the correlation analysis.
### Java Practice

**Correlation Coefficient r**

<table>
<thead>
<tr>
<th>$X_i$</th>
<th>$Y_i$</th>
</tr>
</thead>
<tbody>
<tr>
<td>16.949</td>
<td>52.713</td>
</tr>
<tr>
<td>31.355</td>
<td>37.209</td>
</tr>
<tr>
<td>87.796</td>
<td>41.085</td>
</tr>
<tr>
<td>87.288</td>
<td>58.914</td>
</tr>
<tr>
<td>51.694</td>
<td>31.007</td>
</tr>
<tr>
<td>84.406</td>
<td>62.790</td>
</tr>
<tr>
<td>84.745</td>
<td>74.418</td>
</tr>
</tbody>
</table>

$r = 0.647$
Story of Statistics

Script

Let's share an interesting statistical story together.

When we think about the die, the regular hexahedron comes across our mind.

This is the frequently used die, which has a pretty deep historical background.

It was said that there was a die as the current shape.

- History of Dice
  - Egypt: Dice as the current shape were used in the Egyptian dynasty times, about B.C. 3400
  - Caesar: "The die is rolled" by Julius Caesar as he crossed the Rubicon river in the time of Rome.
  - China: Dice were used on the game called "ssangyuk" in the Su and Tang dynasty.
  - Silla Dynasty: "14 faces-die" excavated at the lake called AnAPJi in Kyungju city.

- Construction of the "14 faces-die"
  - On the regular hexahedron of which side is in length of five, cut the triangle horn with 8/2 long side corner.
  - This die is consisted of eight triangle planes and the six square rectangles.
  - Then there are eight equilateral triangle sides and six regular square rectangle sides in length from the original plane of a die.

- Probability of Each face on "14 faces Die"
  - Assumptions
    1. Assuming a sphere circumscribing the die is rolling along with the 14 sided die rolls.
    2. When a sphere is stopped, assume that the lower point is always at the same distance from any surface of the sphere.
e-Stat S/W s-Link
Innovative Use of ICT for Open and Distance Learning

UNSIAP e-Library
Advanced Learning

- New Information Comm. Technology
  - m-Learning
  - u-Learning
  - t-Learning, etc.
m-Learning
**Definition of m-Learning**

m-learning is e-learning with the freedom to change **location** while learning [*ISO/IEC JTC1/SC36/WG1*]

m-learning is e-learning through **mobile computational devices** [*Anna Trifonova*]

m-learning is learning that takes place via such wireless devices as cell phones, personal digital assistants (PDAs), or laptop computers [*Glossary of ASTD’s Learning Circuits*]
m-Learning

Mobile Communication Market in the World

A Prospect of Mobile Communication Market in the World

From Mobile@Ovum, 2004
m-Learning Environment

- PDA in school bus
- Mobile computer in museum
- LMS (Learning Content)
- PC-www at home
- Cellular phone in playground
Characteristics of m-Learning Environment

- Limitation of mobile device hardware and software
- Varied network bandwidth of one session
- Frequent unpredictable disconnection
Content Development

- File size
  - Suitable for PDA or Mobile
  - Flash program
  - Well-divided content units
Content Design

- **Design strategies**
  - Learning content should be designed for
    - *Short knowledge acquisition*
    - *Learn basic concepts*
    - *Repeat practices*
    - *PDA or wide screen MP*
    - *Content sequencing models*
Content Development

Innovative Use of ICT for Open and Distance Learning
LMS for m-Learning with PDA

- Inter-content sequencing model

Start → add → subtract → multiply → divide → Finish
• **Intra-content sequencing models**

```
LMS for m-Learning with PDA

add → Intro add → p & p → n & n → p & n → test → sub

div → Intro div → p & p → n & n → p & n → test → Finish
```
LMS for m-Learning with PDA

- Learner Information
- Content
- Assessment
LMS for m-Learning with PDA

- Learner Information
- Content
- Assessment
LMS for m-Learning with PDA
LMS for m-Learning with PDA

Innovative Use of ICT for Open and Distance Learning
Demo of m-Learning with PDA
m-Learning at KNOU

The socializing powers of mobility and wirelessness could expand the drive into collaboration.
m-Learning at KNOU
M-Learning at KNOU

University Announcement

Department Grade Semester

List of Courses

Academic Affairs Announcement

Mobile Learning Class

List of Courses:
1. 국어
2. 세계의 역사
3. 민간과 과학
4. 민간과 사회
5. 대학영어
6. 컴퓨터의 이해
7. 12345
Mobile Campus in Hand!!!

• Using new information sharing device Mobile Phone make renovation to U-Campus
• Academic affairs
• Service for KT 3G SHOW user

Solution promote the renovation to the new paradigm of KNOU U-CAMPUS

On-Line schooling Provide the supplementary materials
   ➔ Academic Calendar, On-Line lecture, Academic Information Community

Mobile Groupware Supply for Administrative Faculty Members
   ➔ Real time service for Faculty Members for Managing Academic Affairs

Mobile Community for Alumnai Network Community
   ➔ Job searching and exchange information
System Configuration for Mobile Learning

Provide Composite Solution of On and Off line Direct Connection between the LMS for KNOU U-Campus and KT Mobile Solution

- KT
  - Contents Server
  - Mobile Server
  - Database Management

- KT WCDMA Networks

- KNOU Academic Affairs DB
- KNOU Homepage
- Pop Up Campus
- Professor/Student
- Students Mobile Phone
- Student PC

Innovative Use of ICT for Open and Distance Learning
Support for the student’s Mobile Learning for degree

- **LMS**: Provide the useful academic information for compensate the limit of off line campus activity by Mobile phone

- **CMS**: Mobile Lecture: Provide the Web courses and Multimedia lecture by wireless Mobile phone and connect to the on line courses as individual learning speed.

- **Provide learning community for the real time sharing of the learning resources for credit**
USIM Based Campus solution

- Academic ID
- Transport Card
- Cash Card

- Student Daily Check
- Uni Entrance Check
- UNI Member Check

- Bus Card
- Subway
- Internet Shopping

- Restaurant
- Library

- Issue the ID
- Parking
m-Learning Service

Start with ID Number

Menu Orientation

Menu of Download
Hot number connection & Download

m-Learning Service

Pop up U-KNOU Download Window

Download waiting Window

USER Registration

Innovative Use of ICT for Open and Distance Learning
m-Learning Service Menu

- Campus Information Window
- Academic Information Window
- M-Learning Class Window
  - VOD/AOD Courses
  - e-Contents Service
m-Learning Class Menu

Student Identification

List of Courses
 Innovative Use of ICT for Open and Distance Learning
m-Learning
Introductory Statistics
**Spec for m-Learning**

- **Input Type:** mp4v
- **Dimensions:** 240*192, 176*144
- **Frame Rate:** 10.00 Frame/sec
- **Sample Rate:** 8000 sample/sec
- **Sample per bits:** 16bit/sample
- **Play Channel:** 1 channel
- **Bitrates:** 128 Kbit/sec
Demonstration
- **e-Learning**

  ✤ **New Paradigm for “LET”**

  ✤ **Definition**
  - an online education through the computer networks, providing educational services by taking advantage of ICT.

  ✤ **Advantages**
  - *Whenever and wherever you want to learn, you can do it!*
  - Reduction of educational costs
  - Repeated learning
  - One-to-one bi-directional education
m-Learning

Definition

- e-learning through mobile computational devices
  
  [Anna Trifonova]

m-Learning Environment

- Learning while moving
- Overcome some limitations
 Remarks

- Content development for m-Learning

- What we needed...
  - To overcome the limitation of PDA and communication networks
  - To minimize data traffic and communication sessions between LMS and PDA

- How we could do...
  - Segmentation of learning content
  - Content sequencing models
Technology from classroom to lecture hall
Thank you!