

MOBILE E-BOOK FOR OBJECT-ORIENTED DYNAMICALLY LINKED STATISTICAL PACKAGE K-PLOT FOR 5-9 GRADERS

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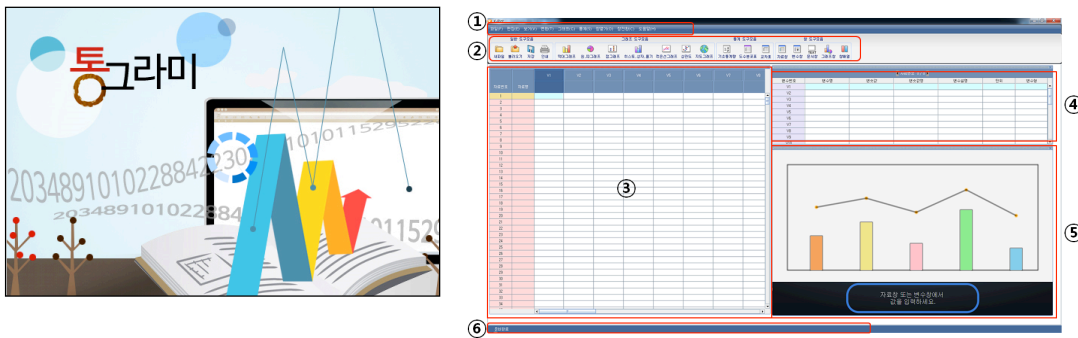
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Modern statistics is used in many fields, while many of those users face difficulties in understanding statistical concepts. On the other hand, elementary school curriculum covers stem and leaf plot, pie chart, charts for proportional data as well as descriptive statistics including the mean. We find that an “intuitive” statistical package focused on 5–8 graders for statistical education will help future statistics users understand statistical concept at earlier stages of their lives. The mobile e-Book was developed for students’ easy access and they can have a class without limit of place and time, we call just on time and just for learner.

■ BACKGROUND

Elementary school curriculum includes several statistical concepts and many graphical methods. However statistical concepts are difficult to understand and many of those graphs and numerical summaries are obtained by hand. To help students and teachers study statistics we develop an intuitive statistics education package called K-Plots which has an easy operation and good examples for Korean students.

This software covers numerical and graphical statistics that appear in 5-9 graders’ textbooks. The graphs provided are dynamically linked to the data so that every graph is linked to every datum. The graphs of K-Plot are dynamic graphs and morphing technology is used where applicable. Masking is also possible between data and graphs. K-Plots is developed by Java to prepare for mobile environment such as Android system. Fig.1 and Fig.2 are title window and the 1st window of k-plot.



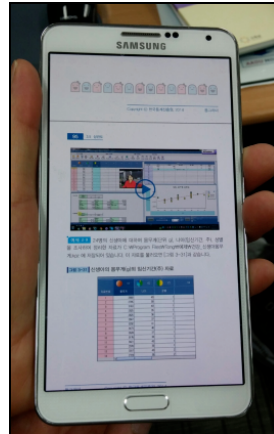
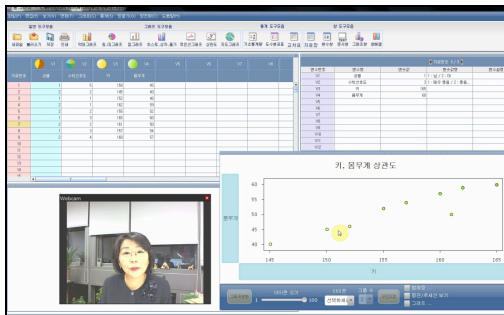
The recent paper book market size is 1065 billion USD at 2011 and estimated average annual growth rate of paper book market is -2.3% but e-Book market size is 55 billion USD at 2011 and estimated average annual growth rate is 30.3%. It shows rapid growth in e-Book market in 2011. The price of e-Book is 9% cheaper than paper book in UK, 11% cheaper in US, 21% cheaper in France and 23% cheaper in Germany.

The rate of digitalization from paper book to e-Book is (100,000 cases) 5% in electronic dictionary, digital thesis, journal, database publication, educational interactive electronic book is 95%. From 2014 to 2016 there was a development and sharing of 100 free e-Books through donation of copy righted University textbook. There are development plan of IST (Interactive Smart Textbook) in 2016.

DESIGN

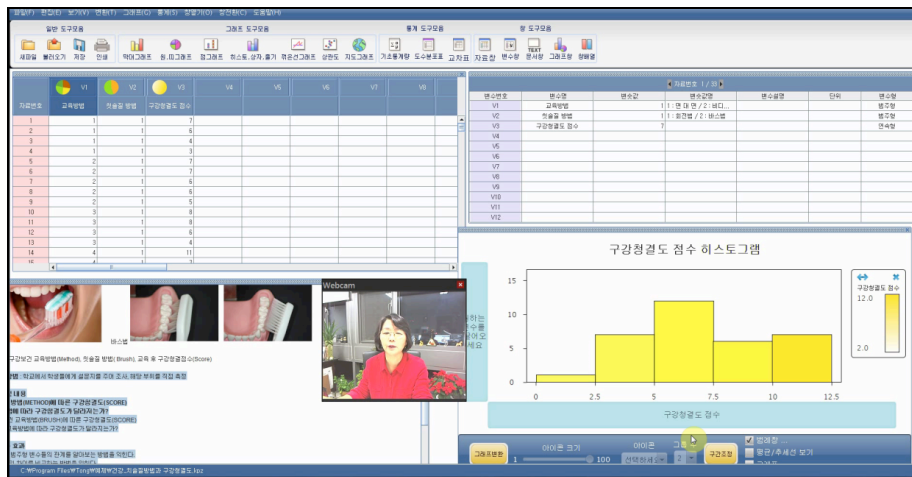
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For the learner's easy access and understanding without limit of place and time we produce the e-Book manual with video lecture using computer screen taping.



OUTCOMES

For tutoring this K-plot statistical package we develop the e-Book of PC version and mobile version too. This mobile e-Book is good for searching the terminology, watching video, tutoring how to use K-plot and how to interpret the outcome. This mobile e-Book will be good for schooling during learner moving place.



IMPLICATIONS FOR PRACTICE

This Mobile e-Book and K-Plot software will be delivered to the whole elementary school with free of charge in Korea and it will be available for to any other country's learner after translation of all contents. It will be used for Math class, History, Korean Language, Science class.

CONCLUSION

We could have a potentiality to develop original software and resources for mobile e-Book which contribute to the Korean student learn the statistical concept and data management and interpretation of output results by themselves. Those kinds of new technology make easily

accessible for little students to learn statistical package and understand the output from K-Plot by learner oriented data handling.

REFERENCES

- Byun H., Choi, W. (2002). Trend and developing process of e-Book , *Study on elementary education*, 15(2), 177-193.
- Gihun R., Hyojung J. (2012). KNOU e-Book prototype production, IDE KNOU Report.
- Kang, H., & Sim, S. (2003). Regression and Correlation Analysis via Dynamic Graphs, *Communications of the Korean Statistical Society*, 10(3), 695–705.
- Keycurriculum (2012). A McGraw-Hill Company, <http://www.keycurriculum.com/>.
- Korea Creative Content Agency (2012). Progress of Digital textbook, Recent trend and future agenda.
- Korea e-Book consortium (2005). Now and future of e-Book industry; e-Book market with ubiquitous.
- Kwanhoon J., Sunghoon A., Jung M. N. (2012). A study on the production agenda of digital textbook, KERIS.
- Lee, C., Kang, H., & Sim, S. (2012). An Implementation of the Sample Size and the Power for Testing Mean and Proportions, *Journal of the Koream Data & Information Science Society*, 23(1), 53-61.
- Lee, J. J., Kang, G., & Han, K. S. (2002). Computer Aided Teaching for Statistics in Internet Age, *Computational Statistics*, 17, 355-365.
- Lee, T. R. (2009). e-Library Correlation and Regression, United Nations Statistical Institute for Asia and the Pacific(UNSIAP), ISBN 978-89-20-92968-7.
- Lee T. R. et al (2010). ICT Transforming Education: A Regional Guide, M-learning for distance education 2010, UNESCO Bangkok, ISBN 978-92-9223-325-9.
- Ministry of Public Administration and security (2011). Guideline of Access of mobile application.
- R Core Team (2012). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. ISBN 3-900051-07-0, URL <http://www.R-project.org/>.
- Tan, L. C., Mujumdar S., Xin, C., Lee, T. R., Burnett, B., Tan, D. T. H., Yuen, A., & Chaudhuri, A. (2011). ICT for Higher Education : case studies in Asia and pacific, UNESCO Bangkok 2011, ISBN: 978-92- 9223-384-6.