



General background

- **How did medical exam include license assessment related to improving the medical education quality?**

The exam shall evaluate the actual abilities. (Competency)

For those abilities can evaluate based on practical test and multi-media questions on ICT system.

The changes of the national license exam are leading changes in the educational era.

- **How medical exam on ICT related to the quality of health services?**

The exam on ICT leads the enhanced education environment.

According to those enhancements, medical educational organizations can produce well-trained medical staffs.

It gives positive effect to achieve the quality of health services.



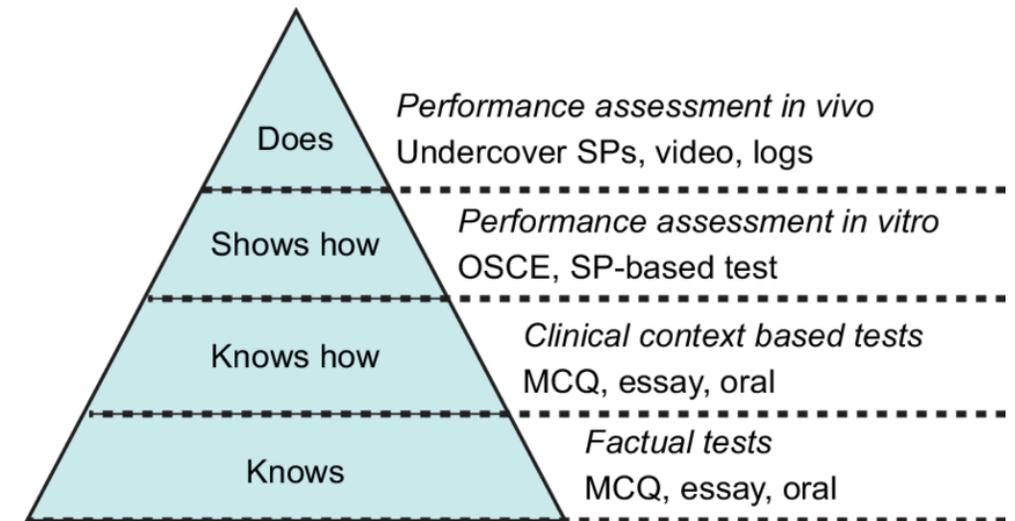
General background

- **Domain: By the Accreditation Council for Graduate Medical Education (ACGME)**

- ✓ Medical knowledge
- ✓ Patient care
- ✓ Professionalism
- ✓ Communication and interpersonal skills
- ✓ Practice-based learning and improvement
- ✓ Systems-based practice

- **Targeting: What can we change on the domains and on the pyramid?**

- ✓ Medical knowledge
- ✓ Support practice-based learning and improvement



SP=simulated patients
OSCE=objective structured clinical examination
MCQ=multiple-choice questions

*Wass et al.'s adaptation of Miller's framework for clinical assessment Source: Reprinted with permission from Wass V, Van der Vleuten C, Shatzer J, Jones R. Assessment of clinical competence. Lancet 2001;357(9260):945-9.



Technical background

PBT



CBT, IBT



UBT, SBT





Technical background

- **Optimized for Future-Oriented question developments**

Improve quality of questions by extending question types and using multi-media sources of sound, video, high resolution image, and simulation mode.

Types of multimedia questions

• **Stack MODE**

• **Photo Reading**

• **Examination Video + Stethoscope Sound**

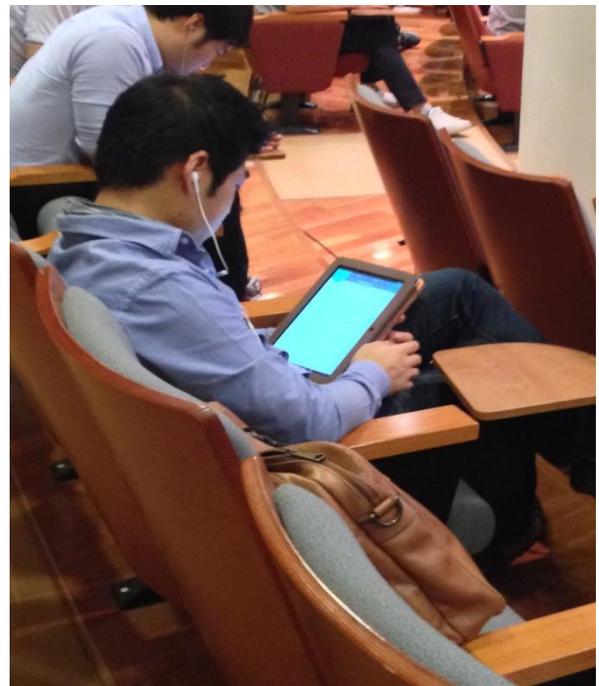
• **Standard Split Clinical Photo MODE**

> **Short-Answer Question**



Changes, Impact in medical education era.

- Y2011**
- Starting the project
- Y2012**
- UBT vs CBT/IBT
- Y2013**
- Developing UBT for national exam
- Y2014**
- UBT replaced SBT
- Y2015**
- Giving effect to medical education sector
- Y2016**
- Expanded to medical education era
- Y2017**
- Implementing national license exam (EMT)
- Y2018~**
- (Under discussion) 23 kinds of national medical license exam will be modified



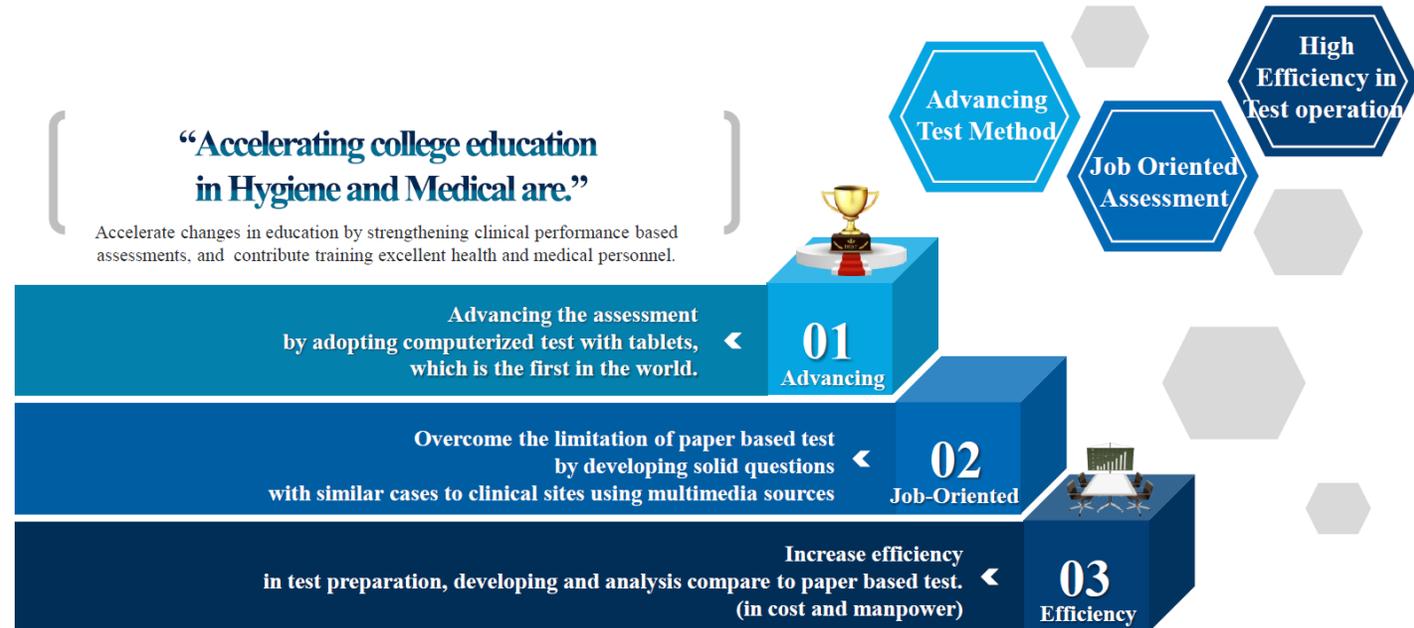


Why?

- Korea health personnel licensing examination institute (KHPLEI)**

Back ground of implementing computerized test(SBT)

- ✓ Accelerate changes in the education by strengthening clinical performance based on assessments, and contribute training excellent health and medical personnel.
- ✓ Achieve its goal to reduce budget by increase cost-efficiency in steps for exam preparation, question developing result analysis.





Impacts

- Spread of technology in Korea medical assessments field.**

After adopting SBT to KHPLI, tablet PC based assessments are spreading to education field (Other national medical license exam, private license exam, private/association certification, medical university/college exam)



[News(MBC broad cast): 2014.12]
http://innnews.imbc.com/replay/2014/nw1200/article/3568977_18424.html



[Bank(MG community credit cooperatives):
Recruit test on job comprehensive test, 1,234 examinees, 2016-06-18]



[Hankuk University of Foreign Studies]



National Licensing Examination

Computerized Examination in Korea Health Personnel Licensing Examination Institute under Korea Ministry of Health. Last July 2014, announcing the introduction of SBT in Emergency Medical Technician Licensing Examination (from 2017) and Medical Licensing Examination (from 2020).

Association & Private License

Introducing and expanding UBT/SBT in Medical Specialist Examination and Medical Resident Examination for Korean Dental Hospital Association, Korean Dental Association, The Korean Orthopedic Association, The Korean Society of Emergency Medicine, The Korean Society of Radiology, etc. since 2014.

University & Educational institution

Launching UBT S/W & H/W package for university.
The following universities introduce and are implementing (as of March 2016): Inje University College of Medicine, Yonsei University College of Dentistry, Catholic University of Daegu College of Medicine, Kyungpook National University School of Medicine, Kyung Hee University School of Medicine, Kyungpook National University School of Dentistry, Daedong College Division of Nursing, Hallym Polytechnic University, Changwon National University, etc.

Educational industry

Establishing business ecosystem and strengthening partnership between H/W and contents.



Impacts detail

- The changes: the specialty board exam.**

In 2016,

Second exam: orthopedic surgery, emergency medicine, laboratory medicine

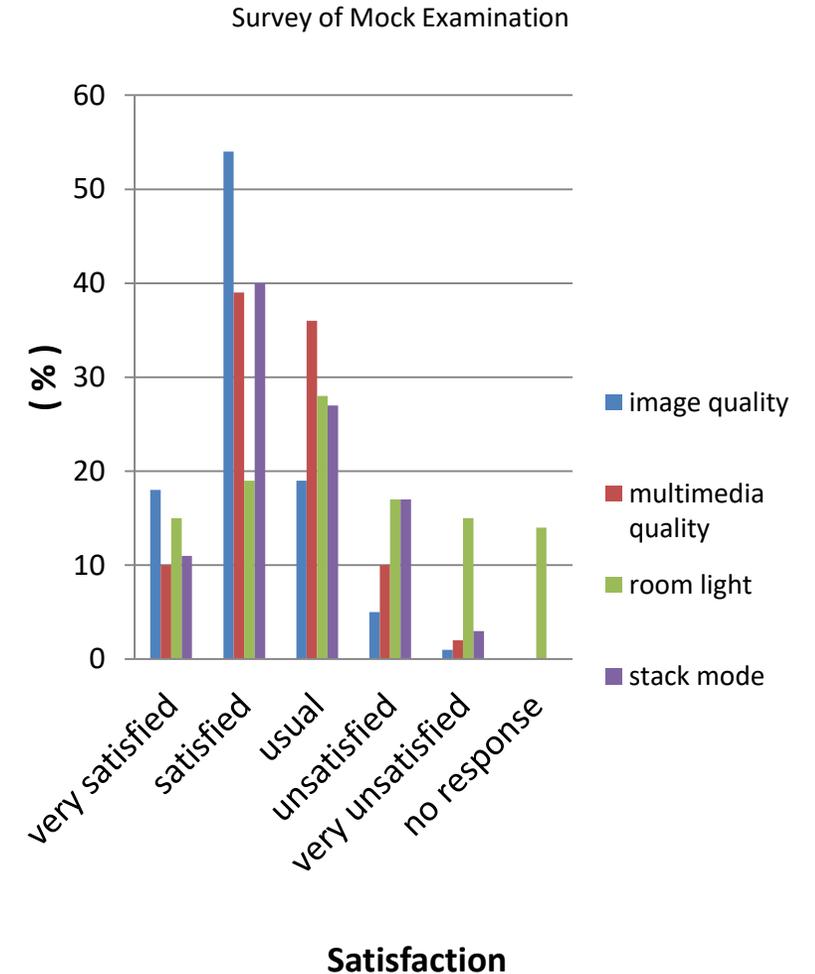
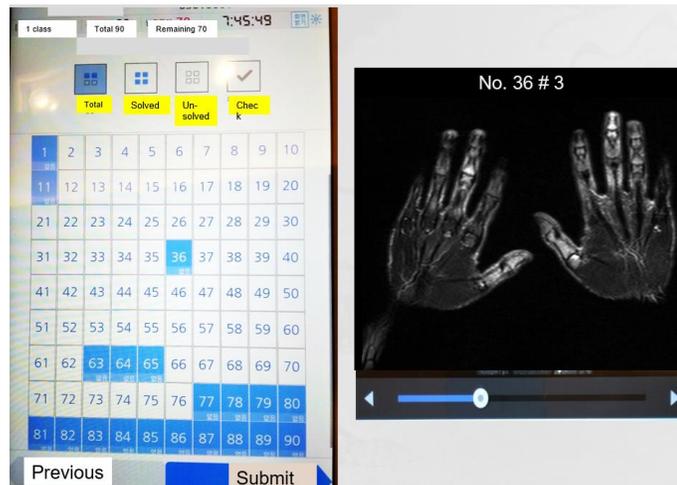
In 2017

First exam: radiology, neurosurgery, thoracic & cardiovascular surgery

Second exam: radiology, OS, EM, LM

- Reference: Radiology Board Certification Examination in Korea**

Mock examination for stack mode question in Aug, 2016





Issues and problems

- **Technical problems.**

- ✓ Ensuring Integrity
- ✓ Stability

- **Issues on the human-computer interface.**

- ✓ Inconvenience UX/UI
- ✓ Differences (PBT vs Computerized test)

- **CBT/IBT vs UBT/SBT**

- ✓ Computer vs Smart devices

- **Policy problems.**

- ✓ Time to solve
- ✓ Implementation process

- **Development of new type of question.**

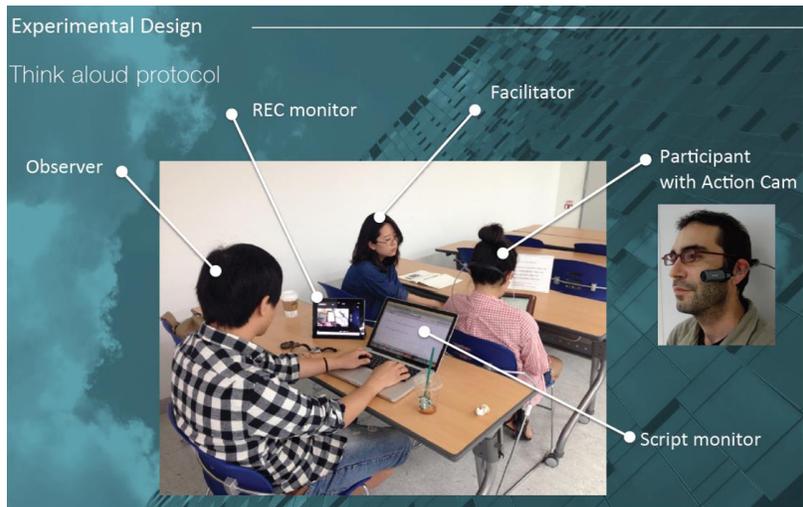
- ✓ Capacity building
- ✓ Need experience

- **Costs**

- ✓ Space
- ✓ Infrastructure



Solutions



NSDevil

SK telecom

IDTC International Design Trend Center



ORIGINAL ARTICLE

Usefulness of ubiquitous-based testing for evaluations in medical education

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의학교육 평가도구로서의 유비쿼터스바람검사의 유용성

경희대학교 의학전문대학원 ¹의학교육 및 의인문학학교, ²내과학교실, ³예방의학교실
⁴정신과, ⁵영상의학과, ⁶응급의학과

Purpose: The purpose of this study was to evaluate the suitability (convenience, objectiveness, and satisfactoriness) of ubiquitous-based testing (UBT) as a medical education evaluation tool.
Methods: UBT was administered using a smart pad in our medical school in May 2012. A questionnaire was given twice. The pre-UBT questionnaire examined possession of a tablet computer, utilization of smart devices, the convenience of UBT, and the usefulness of a medical educational assessment tool. The post-UBT questionnaire evaluated the satisfaction, convenience, and preference of UBT and the usefulness of a medical educational assessment tool, as in the pre-UBT test. The scores were measured on a 4-point scale. 1 is 'strongly disagree' and 4 is 'strongly agree'.
Results: One hundred three students (male, 85.7%) participated in the UBT. The mean age was 28.2±2.4 years. In the pre-UBT questionnaire practice, students responded affirmatively to the items about the suitability of smart devices, clinical skill assessment, and achievement of educational objectives. The responses to the items on the convenience and satisfaction with the UBT were positive in the post-UBT. The factors that affected the post-UBT questionnaire were as follows: knowledge assessment (p<0.001) and achievement of educational objectives (p<0.05) were significant, based on gender, and satisfaction with the UBT (p<0.002) was significant, based on possession of a tablet computer. The relationship between the ranks of this UBT and the average ranks of the three previous questions was statistically significant (p<0.001).
Conclusion: Convenience, objectiveness, knowledge assessment, and completion were useful items in the UBT.

Key Words: Assessment, Computer-based testing, Education, Evaluation, Ubiquitous

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Multimedia-based Cardiac Auscultation Items on USMLE Step 1 and Step 2 CK

- USMLE 2007-08
 - more difficult, less discriminating, and required more time
- USMLE 2007-08 Vs. 2009-11
 - Step 2 CK
 - ✓ Multimedia items; 58 scores
 - ✓ item difficulties; 0.66→0.77, item-total(biserial) correlations increased slightly, and mean response times decreased slightly, Logistic regression analyses controlling for trends in total test performance(p<0.001)
 - Step 1
 - ✓ Heart sound items; 28 scores
 - ✓ item difficulties; 0.61→0.69(p<0.001)

■ Performance on multimedia items has improved significantly
 The overall pattern of results is consistent with improvement in examinees' auscultation skills, at least using MCQ-based assessment.

(NBME, 2012)



Solutions



* Storage of tablets
** Korea Health Personnel License Exam Board under MOHW



* Preparation
** Exam field in ordinary schools in S.Korea

Rapidly growing and enhancing by Public-Academic-Private.



* Capacity building program by government and private sector included university
** Korea Health Personnel License Exam Board under MOHW



* Implementation
** Exam field in ordinary schools in S.Korea

Ubiquitous-based Test (UBT™)
UBT is a test method that drastically improves the way of ordinary testing by using ubiquitous devices such as Tablet, Smart, and other advanced smart devices.





Appendix I.

- Korea – The medical assessment is being changed, and it gives impact on medical education, other industry.



South Korea

대한민국 : SKTelecom, Korea Health Personnel License exam board, Ministry of Education, Samsung electronic Logitech academy and so on.



Appendix II.

- Mongolia, Vietnam



Global activities on the medical assessment part

• Vietnam: PBT and (CBT vs UBT)



• Mongolia: PBT and CBT to UBT

Лицензийн шалгалтыг цаг хугацаа, орон зайнаас үл хамааран авдаг болно.

Эмч, эмнэлгийн мэргэжилтнүүд Мэргэжлийн үйл ажиллагаа эрхлэх зөвшөөрөл авч байж иргэдэд эрүүл мэндийн тусламж, үйлчилгээ үзүүлэх эрхтэй болдог. Дэлхийн олон оронд энэхүү зөвшөөрлийн шалгалтыг UBT буюу смарт төхөөрөмжид суурилсан шалгалтын програм хангамж ашиглан орон зай, цаг хугацаанаас үл хамааран авдаг болоод байна.

Манай орны хувьд ч шалгалт авах үйл ажиллагааг олон улсын түвшинд хүргэн, эмч мэргэжилтнүүдэд чирэгдэлгүй болгох нөхцөл боломжуудийг судлан, нэвтрүүлсээр байгаа билээ.

Эрүүл мэндийн хөгжлийн төв, БНСУ-ын эрүүл мэндийн мэргэжлийн үйл ажиллагаа эрхлэх зөвшөөрлийн шалгалтын програм хангамж хөгжүүлэгч NSDevil байгууллагын хамтын ажиллагааны хүрээнд шалгалт авахад зориулан тусгай програм хангамж суулгасан 30 таблетийг дагалдах хэрэгслийн хамт ЭМХТ-д хандивллаа. Тоног төхөөрөмжүүдийг NSDevil байгууллагын Монгол дахь төлөөлөгчийн газар болох "Mexim consulting" ХХК-ны захирал Ц.Баяр ЭМХТ-ийн ерөнхий захирал Д.Ганцэцэгт гардуулан өглөө.

Энэ үеэр Д.Ганцэцэг захирал "Эдгээр төхөөрөмжүүдийг туршилтаар үйл ажиллагаандаа ашиглан цаашдаа олон улсын түвшинд хүрсэн давшилтат технологийг нэвтрүүлэн шалгалтыг орон зай, цаг хугацаанаас үл хамааран авдаг болох нөхцлийг бүрдүүлэх зорилго тавин ажиллана." хэмээн цохон тэмдэглээ.

Уг төхөөрөмжийг БНСУ-ын томоохон анагаах ухааны боловсрол олгодог их, дээд сургуулиуд сургалт, шалгалтандаа ашиглахаас гадна эмч, мэргэжилтнүүдийн Мэргэжлийн үйл ажиллагаа эрхлэх зөвшөөрлийн шалгалтыг авдаг юм байна.

Төхөөрөмж дээр суурилуулсан програм хангамжаар зүрхний цохилт, уушгийн чимээ болон ЭХО, MRI зэрэг зураг, дүрсийг харах, өвчний түүх үүсгэн асуулт бэлтгэх зэргээр нэмэлт мэдээлэл, хичээлүүд оруулан ашиглах өргөн боломжтой юм. Тиймээс эдгээр таблетуудыг шалгалт авахад төдийгүй эмч, эмнэлгийн мэргэжилтнүүдийн мэргэжил дээшлүүлэх, чадавхижуулах сургалтанд ашиглахад ч үр дүнтэй юм.





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Special thanks to Changwon National University / Don Mariano Marcos Memorial State University / Pasundan University / Korea National Open University / Tribhuvan University / Kathmandu University / HUE University / Cheju Halla University / Inje University school of medicine / Yeonsei University school of dentistry / Georgia University / Umfologi college / Mongolian University of Science and Technology / German-Mongolian Institute of Technology / Ministry of Education and Training in Vietnam / Hai Duong CEC / Dept. City school division of Quezon / Dept. City school division of Marikina / University of Indonesia / University of Islam negri Jakarta / Daegu Catholic University / Daedong University / DFI Foundation / 23th Foreign Language School / Korea National Health Personnel License Examination Board, Ministry of Healthcare and welfare / National Research Foundation of Korea, Ministry of Education / SK Telecom / Samsung Eletronic Logistics Academy / PT.PEP / CosmicLion / Kyungbuk National University / Kyungheui University school of medicine / Dongkuk University school of medicine / TunTun English / ReadingTown USA / Tosel committee / HB Brain Institute / And all of organizations in EEO BULT network.
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