

Smart Mobile Application Based Portfolio; Is It Convenient For Assessment?

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Background: Portfolios are an important widely used tool for evaluating medical students' progression in clinical competence and professionalism. Smart Mobile application-based portfolio was developed because technology is now playing a crucial part in today's learning style and aids both students and instructors in the process of learning, revision, assessment and reflection. The beta-test application is available on both IOS and android phones for use by medical students rotating through ophthalmology departments.

Methods: Five attending ophthalmologists and 110 medical students rotating in the ophthalmology department from Thammasat University, Chulalongkorn University and Chumphon hospital were enrolled in this study. All participants used the application from the first to the final day of their ophthalmology clinical rotation. On the final day of their rotation, an evaluation form was completed by all participants regarding their feedback about the application.

Results: A majority of the students and attending ophthalmologists completely agree that the essential skills the students need to learn are listed in the application (54%), the medical skills listed were actually trained (59%), the attending doctor's advice is helpful for personal development (62%), the application is easy to use (60%), attending doctors and students can record what they have learned (47%), and the application touchscreen is easy to use (58%). Most of the students and attending ophthalmologists somewhat agree that the application is flexible for the students (40%), the students and attending doctors will use the application regularly (43%), and the medical skills guide and recommendation are useful in practice (42%).

Conclusion: A smart mobile application-based portfolio is feasible and convenient for assessment. However, the application still needs further development to meet the users' expectations.

Keywords: Smart Mobile, application, portfolio, Ophthalmology

EyeSEA 2020;15(2):87-92

DOI: <https://doi.org/10.36281/2020020302>

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Received : June 24, 2020

Accepted : August 5, 2020

Published : December 31, 2020

Introduction

Portfolios are used for all levels of medical education and evaluation.¹ Portfolios are also used in other situations. A Portfolio is a collection of evidence that learning has taken

place.² A Portfolio is a purposeful collection of a student's or other's efforts or achievements in one or more areas.³ Portfolios include all kinds of evidence which give the possibility to draw valid conclusions about competence.⁴ The practice of a portfolio is suitable for assessing professional competence through several areas of competences and for achieving the highest level of the Miller pyramid as an assessment tool.⁵

Electronic web portfolios have also been developed and replace old fashion paper portfolios. There are many advantages over paper based. One of the most powerful is to offer feedback which is mainly focused on the assessment of generic skills and provides quantification of progress.⁶ However, in the disruptive world, there may be new tools that are faster to use and more convenient than electronic web portfolios. We hypothesize that application-based portfolios are this tool.

Smart Mobile application based portfolio was developed based on the fact that technology is now playing a crucial part in today's learning style and aids both students and instructors in the process of learning, revision, assessment and reflection.

Material and methods

The Smart Mobile Application was designed in accordance with a competent management pattern. The skills that medical students are required to attain are collected and then demonstrate what they have learned from the following sources (A) Official program of medical student (B) Medical Competency Assessment Criteria for National License (C) the logbook of Thammasat eye center for medical students.

The participants in this study are 5 attending ophthalmologists; 3 at Thammasat University, 1 ophthalmologist at Chulalongkorn University and 1 ophthalmologist at Chumphon hospital. There are 110 medical students in these hospitals that attended in ophthalmology clinics. On the first day both ophthalmologists and students received handouts about how to download, register and use the application (figure 1-3). The application is available on both IOS and android phones. After they register and log into the application, students can view the menu that is divided into 3 categories: general ophthalmology knowledge for medical students, surgical skills that should be performed and status checked. In general knowledge, there is an Ophthalmology E-book for medical students. In surgical skills, medical students need to fill in the form and take a photo of what kind of surgery they have done and submit them to the attending ophthalmologists. After they submit the documents there will be an email alert to those attending ophthalmologists. In Status checked, a student can compare what they have learned with their colleagues. At the end of the rotation, students are required to fill in an evaluation-form (table1) and send it back to the department of ophthalmology of each institute.

Results

All of the students completed their questionnaires and sent them back to the department of ophthalmology of each institute. The majority of the students and attending ophthalmologists strongly agreed that the essential skills the students need to learn are listed in the mobile application (54%), the medical skills listed are actually

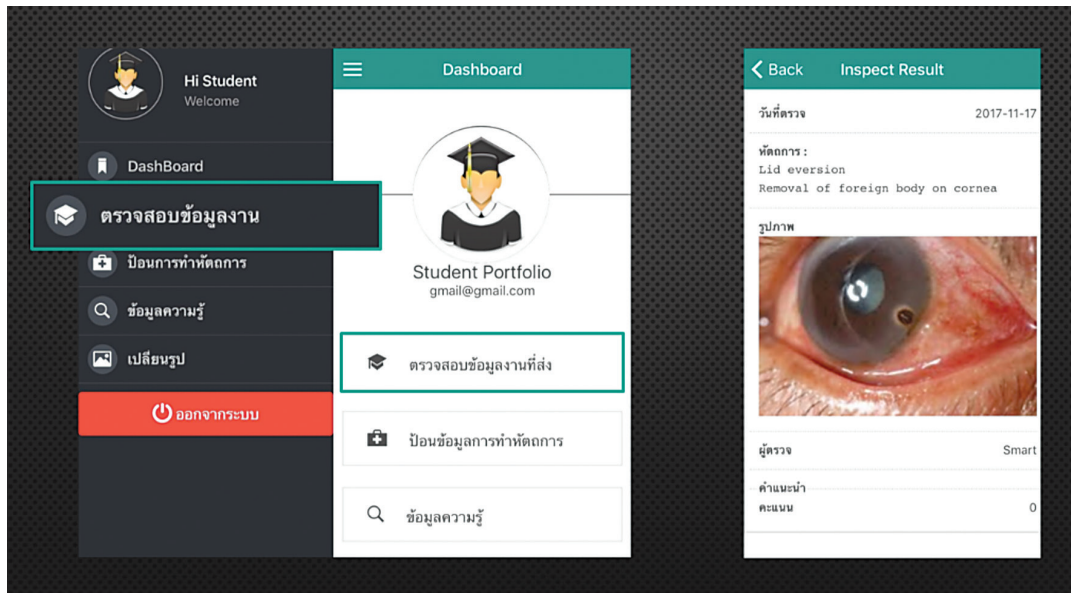


Figure 1: Features inside smart mobile application portfolios



Figure 2 and 3: Students at Thammasat university hospital learn to use the application on the first day of their rotations.

Table 1: Application Evaluation Questionnaire

แบบประเมินการใช้ Application : Smart Mobile Application Based Portfolio

คณะแพทยศาสตร์ มหาวิทยาลัยธรรมศาสตร์

ชื่อ-นามสกุล _____ วันที่ _____

	ไม่เห็นด้วย>>เห็นด้วยอย่างมาก			
	1	2	3	4
1.ทักษะที่ได้รับการฝึกฝนมีความสอดคล้องตรงตามหลักสูตรการเรียนการสอน				
2.ทักษะต่างๆได้รับการฝึกฝนในสถานการณ์จริง				
3.ข้อเสนอแนะที่ได้รับจากอาจารย์ช่วยให้นักศึกษาแพทย์สามารถพัฒนาตนเองได้				
4.แอปพลิเคชันมีความยืดหยุ่นและสามารถปรับตามความต้องการของนักศึกษาได้				
5.แอปพลิเคชันใช้งานได้ง่าย ไม่ซับซ้อน				
6.นักศึกษามีแรงจูงใจในการใช้แอปพลิเคชัน และเลือกใช้งานแอปพลิเคชันเป็นประจำ				
7. แอปพลิเคชันสามารถประเมินและสรุปผลการเรียนรู้ให้แก่นักศึกษาและอาจารย์ได้				
8.คำแนะนำและขั้นตอนในการทำหัตถการที่จัดเตรียมให้นักศึกษาในแอปพลิเคชัน ช่วยนักศึกษาในการเรียนรู้ได้ดี เข้าใจง่าย				
9.การกดใช้งานหน้าจอของแอปพลิเคชัน touchscreen ใช้ได้ดี ไม่ติดขัด				

ข้อเสนอแนะ

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Application-user evaluation form of ' Smart Mobile Application Based Portfolio '

Name-Surname				
Date of assessment				
	Disagree >> Agree			
	1	2	3	4
1. The medical skills that is required are listed and were actually trained				
2. The medical skills that you trained is also in the clinical practice				
3. An attending-ophthalmologist advice is helpful for clinical skills development				
4. The application is flexible for user-assessment and evaluation				
5. The application is not too complicated to assess				
6. You think that ' Smart Mobile Application based portfolio ' is feasible and convenient for assessment				
7. The application will report exactly result of the medical skills that were trained				
8. The medical skills that performed in the application is helpful for clinical-performance learning				
9. The touch-screen application is user-friendly				

Recommendation.....

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trained (59%), the attending doctor's advice is helpful for personal development (62%), the application is easy to use (60%), attending doctors and students can record what they have learned (47%), the application touchscreen is easy to use (58%). Most of the students and attending ophthalmologists somewhat agree that the application is flexible for the students (40%), the students and attending doctors will use the application regularly (43%), the medical skills guide and recommendation are useful in practice (42%).

Discussion

Qualitative methodology from data analysis was considered an appropriate tool for evaluation and convenient for assessment.⁷ A limitation of this study was its relatively small sample size. The portfolio itself also had the limitation that it focused mainly on reflective competence and did not include general clinical knowledge competency.⁸ However, using this smart mobile portfolio application, students can integrate specific knowledge, skills, and progress to meet curriculum objectives.

Disadvantages of electronic portfolios include the need for internet access and IT literacy among medical staff and students.⁹ Although everyone involved in this study met those requirements, some students may not, in which case they would be unable to use the electronic portfolio. Nevertheless, this pilot study was successful; participants were generally enthusiastic about the new learning and assessment method.

Conclusion

Smart Mobile application based portfolios seem to be feasible and convenient

for assessment. However, the application still needs further development to meet the users' expectations.

Reference

1. Epstein RM. Assessment in medical education. *N Engl J Med*. 2007;356(4):387-396.
2. Davis MH, Friedman Ben-David M, Harden RM, et al. Portfolio assessment in medical students' final examinations. *Med Teach*. 2001;23(4):357-366.
3. Arter, J.A. and Spandel, V. (1992), Using Portfolios of Student Work in Instruction and Assessment. *Educational Measurement: Issues and Practice*, 11: 36-44.
4. Draper, P.. (2001), *Handbook of Qualitative Research*, 2nd edition edited by Norman K. Denzin and Yvonna S. Lincoln. Sage, Thousand Oaks, 2000, 1144 pages.
5. Miller GE. The assessment of clinical skills/competence/performance. *Acad Med*. 1990;65(9 Suppl):S63-S67.
6. Maza Solano JM, Benavente Bermudo G, Estrada Molina FJ, Ambrosiani Fernández J, Sánchez Gymez S. Evaluation of the training capacity of the Spanish Resident Book of Otolaryngology (FORMIR) as an electronic portfolio. *Acta Otorrinolaringol Esp*. 2018;69(4):187-200.
7. Sandelowski M. Whatever happened to qualitative description?. *Res Nurs Health*. 2000;23(4):334-340.
8. Driessen EW, Overeem K, van Tartwijk J, van der Vleuten CP, Muijtens AM. Validity of portfolio

assessment: which qualities determine ratings?. Med Educ. 2006;40(9):862-866.

9. Andrews T, Cole C. Two steps forward, one step back: the intricacies of engaging with e-portfolios in nursing undergraduate education. Nurse Educ Today. 2015;35(4):568-572 .