



# A Low Cost Self-learning eMAR Package For Nursing Students

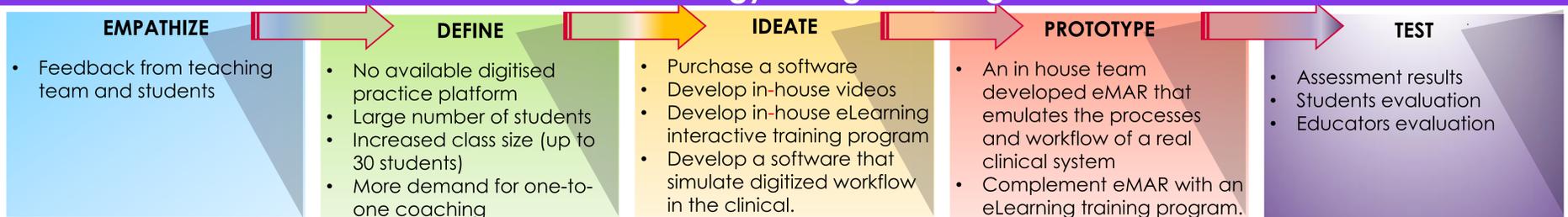


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## Introduction

An in-house team designed a learning package (LP) to provide nursing students with a robust learning opportunity to practice digitised workflow on oral medication administration using the Electronic Medication Management Technology (EMMT), at the School of Health and Social Sciences (SHSS), Nanyang Polytechnic. Students were taught in a blended learning environment combined with flipped classroom approach where students used the LP before coming to class. The introduction of the LP, aim to help the learners (1) improve their knowledge in safe oral medication administration (OMA), (2) promote their competency in OMA with the ease of accessing the electronic medication administration record (eMAR) and (3) enhance their autonomy in learning within a technology-enabled environment.

## Methodology: Design Thinking



## Description

### Component 1: eMAR Platform - SeNS

- Emulate the process and workflow of a real clinical system
- Pre-programmed fields to self-populate providing decision support
- Alpha-Numeric barcodes for patient identification and medications
- Embedded checkpoints enable closed-loop medication process

Excel spreadsheet, as the user interface and eMAR functionalities

### Component 2: eLearning Training Program

**Part 1** - Introduction to the features of the eMAR platform

**Part 2** - Demonstration of the process of administering oral medication using a clinical case

**Part 3** - Quiz to self-evaluate student's learning

## Findings and Discussion

The SHSS eMAR for nursing students (SeNS) was piloted in April 2018 and officially introduced in the teaching and assessment of OMA to 817 Year 2 nursing students in year 2019. After 5 weeks of lessons, students were assessed competency in OMA. Surveys were conducted on the nursing students and the teaching team. Of the 817 nursing students who were assessed, 623 (76.2%) completed the survey. The findings revealed (Fig. 1) that most of the students (83% to 88.3%) agreed that they were able to pace their own learning in readiness for the OMA competency assessment. The students perceived level of knowledge, skills and readiness for the competency assessment suggested that they were well prepared and ready for OMA competency assessment (Fig. 2). 94.5% reported that their level of knowledge and skills had improved. There was an increase in the pass rate by 5.5% in 2019 compared to 2018 (Fig. 3). However, an independent t-test showed no significant difference in the scores for 2018 and 2019 (Fig. 4). All lecturers (n=15) rated positively to the introduction of the LP in the teaching and learning (Fig. 5).

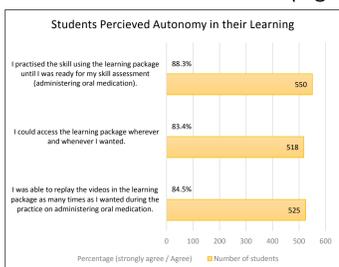


Fig 1

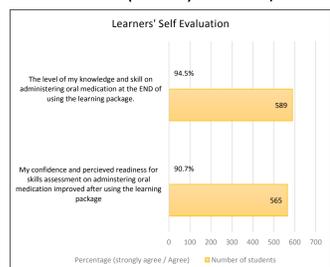


Fig 2

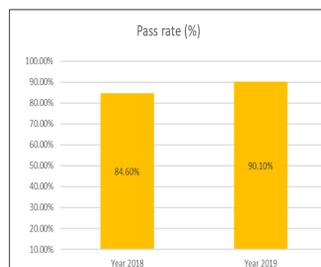


Fig 3

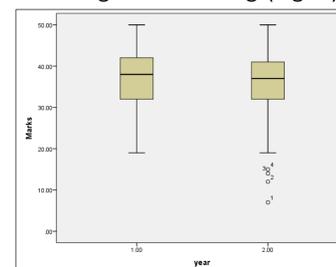


Fig 4

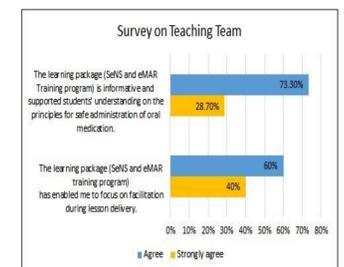


Fig 5

The results revealed that students' learning experience had been enhanced in terms of autonomy, ease of access and convenience. It also suggested that there was a gap between the students' perceived readiness and efficacy versus the actual competency of OMA. Although students' perceived understanding on safe OMA principles had increased, their competency assessment may have been affected by assessment-induced stress, dexterity, decision making ability and client-centredness (Sulosaari, Suhonen, & Leino-Kilpi, 2011). Therefore, competence includes having knowledge, skills and being equipped to meet the complex demand of the expected task. The design of the e-learning training program can be enhanced further to address these important elements. These findings may also challenge the notion that the flipped model using self-study in an experiential setting is more effective than the traditional teaching of clinical skills (McCabe, Smith, & Ferreri, 2017). Future research or evaluation work should be conducted to find the optimal blending of teaching methods to achieve a positive effect on skill retention (Lehmann et al., 2019) in the local setting.

## Conclusion

The LP facilitated teaching; it was labour efficient and well perceived by our learners as it allowed them to access the learning materials at their own convenience and pace. They valued the flexibility and sense of autonomy facilitated by blended learning (Bloomfield & Jones, 2013). Further exploration is needed to identify factors that influence competency in OMA for nursing students. These factors can be incorporated considering the pedagogical design to make meaningful contributions to clinical skills education.

## Acknowledgement

We would like to express our deep gratitude to our students and team of lecturers who gave us feedback on the use of LP, Ms Chia Choon Yee (T & L Specialist, Senior Lecturer) for her insightful advice on result analysis, the reviewers who gave us detailed and valuable comments and the management of SHSS for their support in the implementation and evaluation of the project.

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