



## Introduction of Formative Assessments to Improve Learning Outcomes for Polytechnic Students' Packing Competency Training



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### Introduction

In preparation for their transition to the workforce as Pharmacy Technicians, Year 3 polytechnic students undergo attachments at various pharmacies for exposure. In KKH, students undergo medication packing training for three weeks followed by a competency test. Instead of relying on one summative test, there was a need to have more methods to ascertain their packing competency. A new training framework comprising of multiple formative assessments to check their understanding and support their learning was introduced.

### Purpose

Through the formative assessments, we aim to improve student learning outcomes as follows:

- understand the importance of patient safety
- adhere to packing procedures

### Method

The principle for developing the formative assessments are as below (see Diagram 1):



Diagram 1. The Learning Feedback Loop

- The success criteria for achieving these goals were defined for students' and mentors' clarity.
- Various methods of evidence collection of their learning progress were adopted, such as observations, oral questioning and reflection. Through these data, learning gaps were identified and mentors were able to provide quality and specific feedback allowing students to take note for improvement.
- Together the mentor and student could then come up with a mutually agreed action plan that would help the student work on closing the learning gaps. This may be repeated for a few cycles until the learning feedback loop is closed.

The following formative assessments were introduced:

**1. Direct Observation of Procedural Skills (DOPS)** (see Diagram 2) – facilitates compliance to packing procedures. Mentors observe students' packing steps based on a checklist. When students missed a step, timely feedback was given with an acknowledgement by students for an action plan.

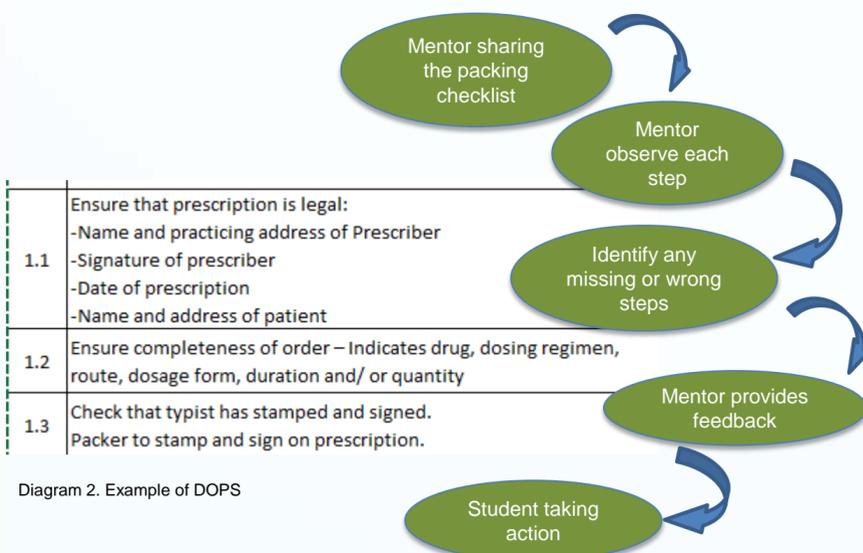


Diagram 2. Example of DOPS

**2. Oral Questioning** (see Diagram 3) – The oral questions include recall of important foundational knowledge and applying this knowledge for problem-solving. Students' answers reveal their ability to apply their learning and mentors can identify their learning gaps.

Two types of questions are used (see examples below):

- Close-ended questions get students to recall learning
- Open-ended ones can assess how students apply knowledge, analyze, make conclusion and facilitate self-assessment.



Diagram 3. Examples of questions

**3. Written reflection exercise** – After each near-miss, students fill up a reflection exercise. With the help of mentors, areas of improvement are identified and discussed. Students are asked the following questions:

- What went wrong?
- What should have happened?
- Why did it happen?
- What should I have done?
- What can I do in the future to prevent this from happening again?

With this exercise, students are encouraged to analyze each near miss in a systematic manner, to learn from it and know how to prevent it from happening again. Mentors play an important role in understanding the thought process of a trainee.

Equipped with the knowledge obtained from reflection exercise and oral questioning, mentors can then discuss with students, clarify any issues, give constructive suggestions and help students set a goal.

### Results

The assessments were piloted on 18 students and surveys were conducted. Despite being unsure on how to carry out formative assessments initially, mentors eventually agreed that formative assessments enhanced learning and helped promote an active learning environment. One mentor commented that she became more engaged with the students and these assessments allowed her to play a more active role in facilitating student learning. Another feedback that DOPS helps students comply to packing steps; reflection helps students become more careful the next time and questioning helps them verbalize what they know.

Students feedback (see Diagram 4) that learning goals were stated clearly and the assessments provided avenues for them to self-reflect and recall learning, thus further strengthening their understanding of the importance of patient safety and adherence to procedures. This in turn gave them more confidence to pack accurately.



Diagram 4. Students' feedback

### Conclusion

Formative assessments in addition to summative assessment has improved learning outcomes through enhancing the learning experience for polytechnic students' packing competency training.