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## Impact of Self-Assessment on Medical Students' Learning Process

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### Abstract

**Background:** Maintaining professionalism requires sensitivity to identify self-strengths and weaknesses through continuous self-assessment. Self-assessment has been considered as an important aspect to be implemented in education process. However, there is still lack of evidence regarding the impact of self-assessment in the learning process of students.

**Aim:** To find out the impact of self-assessment in students' learning process, particularly in identifying learning needs, setting learning activity and learning duration.

**Methods:** An experimental study was conducted among first year medical students (n=46), which were randomly assigned into either a control or an intervention group. Students in the intervention group, who were initially trained to conduct self-assessment, performed self-assessment whereas the control group students did not. Both groups identified learning needs before and after intra venous cannulation skills (IVCS) training. A week after the IVCS training, students in both groups were asked to recall their learning activities in the past week. Aspects which they learned and duration of learning were compared between intervention and control group.

**Results:** Compared to control group, students in the intervention group learned more intensively on certain aspects, suitable with the identified needs, than another aspects related to IVCS ( $p = 0.001$ ). There was no significant difference in learning duration ( $p = 0.132$ ).

**Conclusion:** This study offers an evidence that self-assessment influenced students to prioritize their learning needs.

**Keywords:** self-assessment, learning need, learning activity

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### Introduction

In educational setting, self-assessment is considered as one of the methods used for identifying learning needs (Grant, 2002). Strengths and weaknesses identification of current ability may guide students to determine

their priority in their learning process. In medical education, priority does matter for students. They have to learn loads of material in a short period of time. It forces them to learn most important materials and prioritize them (Bandaranayake, 2009). Learning needs identification based on self-assessment may assist students in planning learning activities according to their identified weaknesses or gaps (Asadoorian & Batty, 2005; Bandaranayake, 2009).

Although self-assessment has been considered as an important aspect in the learning process, Colthart *et al.* (2008) reveal that only few studies investigated the effect of self-assessment program as the only intervention. Most studies focused on self-assessment accuracy, by comparing self-assessment with external assessment, and other factors that might increase it. No study can show that self-assessment helps students identify their

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learning needs and then change their learning behavior. For providing empirical study and answering the question about the impact of self-assessment in learning process, this study is aimed to find out impacts of self-assessment on students' learning process, particularly on identifying learning needs and duration of learning activities.

## Methods

Subjects were first year students at the Medical of Faculty, Universitas Mataram who had attended intra the venous cannulation skill (IVCS) training (n=46). The subjects were divided into two groups, intervention (n=24) and control group (n=22). Characters of the subjects among the two groups did not differ significantly: gender ( $p= 0.397$ ), GPA ( $p= 0.093$ ), achievement in previous OSCE ( $p= 0.640$ ). Ethical approval for this study was obtained from the Research Ethics Committee, Faculty of Medicine, Universitas Gadjah Mada, Jogjakarta and Medical Faculty of Universitas Mataram.

Training on how to conduct accurate self-assessment was given only to students in the intervention group. Student's knowledge regarding self-assessment was tested, pre and post training. Post-test results were significantly higher than the pre-test result ( $8.9\pm 0.81$  vs.  $8.2\pm 0.87$ ;  $p=0.001$ ). Student's ability in practicing self-assessment were also assessed. At the end of the training, students were asked to do vital sign measurement skills. Both the instructor and student assessed the vital sign measurement skills using the same check list. Then, they discussed the differences between student's self-assessment and instructor's assessment result. Spearman correlation coefficient between student's self-assessment results and instructor's results was 0.866,  $p=0.0001$  indicates a good accuracy of self-assessment.

Both groups then followed the training of IVCS. This training was conducted in 3 session (2 hours each) for 3 weeks. The training consisted of lecture, expert demonstration, and student's session for practicing IV cannulation procedures. At the end of the IVCS training, students in the intervention group were asked to do a "structured" self-assessment by a completing checklist, whereas students in the control group may or may not conducted a "unstructured" self-assessment, because they

didn't get the self-assessment check list form, nor the self-assessment training. In both groups, this study measured:

1. The learning needs perception before and after the IVCS. Students were asked about their need to learn 8 aspects related to the IVC Procedure (e.g. preparing the patient and equipments, communication aspect and getting informed consent). The scale used in the instrument was 0 which means the aspects is not necessary, 1 means necessary but will not be learned immediately, 2 means necessary and will be learned immediately. The instrument has a cronbach 0.87.

2. Learning duration: A week after the end of the IVCS training, students were asked how much time they spent for studying the IVCS during the past week.

3. Learning activity: Besides learning duration, students were also asked whether they studied aspects related to IVCS in the same proportion or were there aspects studied more or less intensively? What were they? From the answers of these questions, we checked for each student, whether aspects which had been studied more or less intensively and were suitable with learning needs which had been identified before.

To investigate self-assessment effect on identifying learning need and activity, comparative analysis was carried out on the mean results of control and intervention group. Comparative analysis applied Mann Whitney U test for independent groups and Wilcoxon Signed Ranks for paired groups.

## Results

The comparative analysis on groups concerning learning need perception shift showed that learning needs decreased in the intervention group, but increased in the control group. However, the difference was statistically insignificant ( $p = 0.387$ ).

Table 1 shows that aspects learned by both groups do not differ significantly ( $p = 0.776$ ). However, students in the intervention group learned more intensively on certain aspects, suitable with the identified needs, than students in the control group ( $p = 0.001$ ). There was no difference in learning duration ( $p=0.132$ ), and although slightly longer in the control group.

**Table 1: Mean comparison of learning activity and learning duration between control group and intervention group**

Aspect	Intervention group	Control group	p
<b>Learning needs perception</b>			
Changes of learning need perception (after minus before IVCS training)	-0.54 ± 4.46	0.36 ± 1.22	0.387
<b>Learning activity</b>			
a. a. Aspects which have been learned during the past week	0.95 ± 0.11	0.92 ± 0.15	0.776
b. b. Aspects which have been learned more intense, suitable with identified needs	0.79 ± 0.41	0.32 ± 0.48	0.001*
<b>Learning duration (hour)</b>	3.54 ± 3.20	4.98 ± 4.73	0.132

## Discussion

Students' learning duration in the control group was longer than that in the intervention group, although it was statistically insignificant. With the same learning duration, students in the intervention group learned more intensively on certain aspects, suitable with the identified needs, whereas students in control group learned all aspects without emphasizing particular area. This indicates that students in the intervention group used the time more efficiently. Asaadorian (2003) describes that subjects who determined their learning needs using self-assessment, used less time to do learning activities which are irrelevant for practice changes.

This study emphasized on how self-assessment as the main intervention affects student's learning process. It did not apply external assessment to evaluate students' self-assessment accuracy. The study was based on students' perception. However, students had been trained to implement proper and accurate self-assessment. The most important factor is to introduce and train students to do self-assessment as objectively and accurately as possible. In future studies, self-assessment may be used as an intervention for a longer period and in another domain to see how self-assessment effect students' learning behaviour and achievement.

## Conclusion

Self-assessment may help students in prioritizing learning. This is shown by the

results that comparing with students who didn't conduct self-assessment, with the same learning duration, students who did self-assessment learned more intensively on certain aspects suitable with their needs. Self-assessment is one of study skills which needs to be introduced and trained early on to medical students.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

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