



## Improve students' effectiveness in lab sessions using instant lab report

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### Research Article

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### Abstract

**Objective:** The objective of this study was to improve students' effectiveness in lab sessions using instant lab report.

**Methods:** First we introduced the instant lab report method for our students. After introducing this method we did the formative assessment end of lab sessions and analyzed the average marks with previous assessment average marks.

**Results:** When we analyzed the formative assessment of student after apply our learning agreement on instant lab report we found average mark of the students was higher than the earlier assessment. We observed 21% increased above 50 mark ranges in their marks and average student marks above 60 mark ranges was significantly increased after introducing instant lab report.

**Conclusion:** Therefore we can conclude that instant lab report method is suitable for up-regulate the students' effectiveness in lab sessions.

**Key words:** instant lab report, formative assessment, lab sessions, learning agreement

### Introduction

Student learning is one of the primary goals of universities. Suitable student-oriented teaching methods can help motivate students and help them realize their potential<sup>(1)</sup>. Assessing process also enables both the teacher and student to monitor the quality of learning and to take action as necessary, thus helping students develop more effective approaches to learning<sup>(2)</sup>. In our lab sessions we have noticed that students were passive to link between theory and practice in their lab sessions. Most of time students were passive in briefing without thinking practical implications. We thought that this could

be happened due to lack of student centered teaching methods. According to Kember, that knowledge is constructed by students and that the lecturer is a facilitator of learning rather than a presenter of information<sup>(3)</sup>. Then we have introduced following strategies to improve our lab sessions. First strategy was to make the student more active in acquiring knowledge and skills in their lab sessions. The second strategy was to make the student more aware of what they are doing and why they are doing it. A third strategy is a focus on interaction, such as the use of lab briefings and other discussion groups. The final strategy is the focus on transferable skills and assessing them as student centered method. For this assessing purpose, we used the method "Instant lab reports" which described in Gibbs et al., 1993<sup>(4)</sup>. Then we implemented this method as student centered assessing method. Therefore one of the aims of this study was designed to narrow the gap between theory and practice in their lab sessions. For this purpose we have introduced instant lab report method for evaluate student activities.

### Methodology

First we organized our specific learning outcomes of each lab sessions (Table 1) in undergraduate students of Department of Pharmacology (n=53).

**Table 1: Defined learning outcomes for each lab sessions**

Outcomes of Cell culture techniques laboratory work	No of lab sessions							
	1	2	3	4	5	6	7	8
1. To apply basic practical skills(Ex: Identify some instruments used in cell culture lab)								
2. To apply students knowledge with pharmacological instrumental handling techniques								
3. To apply the principles of doing experimental work in the subject (Ex: <i>invivo</i> and <i>invitro</i> experiments)								
4. To create student knowledge in observation								
5. To analyze experimental data to solve specific problems								
6. To manage students in writing reports on experiments								
7. To develop skill in problem solving								
8. To organize knowledge in research ideas								
9. To develop skills in communicating technical concepts and solutions								



Then learning outcomes was introduced to students for their preparations for each lab sessions. We also discussed our learning outcomes with our students for get their ideas to improve for our defined learning outcomes. Then we conducted our lab sessions according learning outcomes.

At the beginning of the lab sessions we delivered short theoretical lecture related to instant lab report. We told to the students to submit a lab report as they leave the lab (instant lab report) in every lab sessions (Table 2). After introducing this method we did the formative assessment end of the lab sessions and analyzed the average marks with previous assessment (without introducing instant lab report) average marks of same students. And also after analyzing of our marks we implemented feedback on student learning and get their further ideas of lab session learning.

Data were assessed by using paired t-test, and a value of  $p < 0.05$  was considered to be statistically significant.

### Results

We found average mark of the students was higher than previous lab sessions after introducing instant lab report (Figure 1). We observed 21% increased above 50 mark ranges in their marks (Figure 2) after introducing instant lab report. Also we observed average student marks above 60 mark ranges was significantly increased after introducing instant lab report (Figure 3) compare to last lab sessions without introducing instant lab report.

**Table 2: Example of an instant lab report which we introduced**

Query	Answer
1. What are the main culture conditions should concern in cell culture?	
2. What are the major functions of serum in culture media?	
3. What are the benefits of serum replacement?	

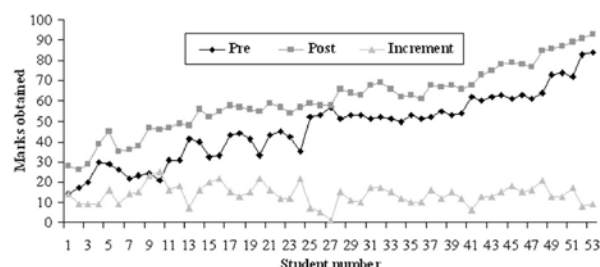
### Discussion:

We have noticed that students were passive to link between theory and practice in their lab sessions. Most of time students were passive in lectures without thinking practical implications. We introduced the method, instant lab report to overcome this problem. This can have a whole range of consequences for how, and how quickly, they go about their lab works, what notes they take as they go along and how closely they listen to initial briefing (5).

This learning method helped us to overcome major problems that we had and the difficulties that students were facing during lab sessions. We found that we were more relaxed and a good rapport was building up during the labs. We felt that this method broken the barrier to link between theory and practice in lab sessions. When we analyzed the formative assessment of student after apply our learning agreement on instant lab report we

found average mark of the students was higher than the earlier assignments (Figure 1).

Figure 1: Comparative evaluation of students marks after introducing instant lab report, Pre: before introducing instant lab report; Post: After introducing instant lab report; Increment; Marks different of Pre and Post (n=53).



We observed 21% increased above 50 mark ranges in their marks (Figure 2) and also we observed average student marks above 60 mark ranges was significantly increased after introducing instant lab report (Figure 3). In this method we can evaluate how far they learn from our briefings in lab and this is very positive strategy to provide learner active.

In this method we asked the students to list out "The three most important points" at the end of the each lab session. Then we collected their answer papers and analyzed. After scanning the papers we were able to provide feedback and possible supplementary teaching. This will improve students' active learning power and providing a feedback to the students will leads to trust their judgment.

Figure 2: Comparative evaluation of students marks ranges after introducing instant lab report, Pre: before introducing instant lab report; Post: After introducing instant lab report (n=53).

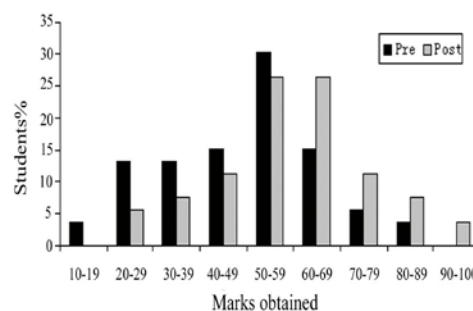
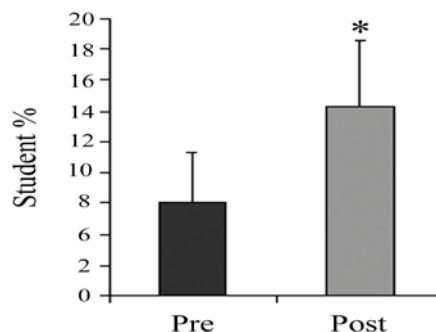


Figure 3: Comparative evaluations of average student marks above 60 mark range (n =53, mean  $\pm$  S.D.). \* $p < 0.05$  vs. Pre (Pre: before introducing instant lab report; Post: After introducing instant lab report)

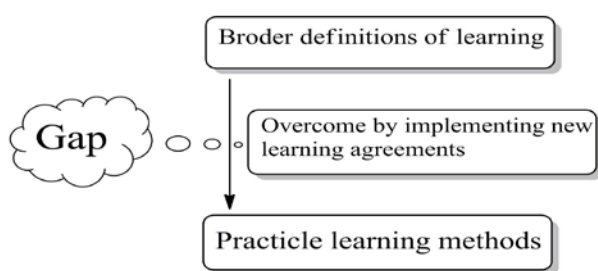




### Conclusion

In our belief, an important role of educationist is to bridge a gap between the broader definitions of learning and the learning methods practiced in Universities (Figure 4). The narrowing of this widening gap can be achieved by encouraging more active and integrated assimilation of knowledge, with an emphasis towards understanding, analysis, application and identifying inter-relationships through the implementation of new learning agreements. Hence we can conclude that instant lab report method is suitable for up-regulate the students effectiveness in pharmacology lab sessions.

Figure 4: Bridging the gap between the broader definitions of learning and the learning methods



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### AUTHORS' CONTRIBUTIONS

Athors contributed equally to all aspects of the study.

### PEER REVIEW

Not commissioned; externally peer reviewed

### CONFLICTS OF INTEREST

The authors declare that they have no competing interests