Reflection on Pharmacokinetic tutorials – a qualitative analysis of students' expectations and evaluations

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Important points

Important points on tutorials at university

- Expectations should be aligned for optimal teaching.
- Time should not be spent on repeating basic knowledge; in this case, semilogarithmic graphs. Instead these could be provided to students and more time spent on interpretation and deeper learning.
- Peer-teaching could be a way to increase students' activity and responsibility.

Introduction

In university classrooms, lectures are the traditional form of teaching, meaning that the teacher gives a lecture and the students listen to the presentation. Tutorials can be taught as regular lectures as well, where the teachers go through the assignments at the blackboard.

However, in itself this is not adequate for creating good learning processes (Postholm 2011) and other methods have been suggested as well (Rump n.d.). For example, it has been suggested that the students can work in groups, finding and solving problems, and the blackboard can be used in between, when specific problems or issues are raised.

I had the task of teaching three different tutorial classes (A, B and C) in the same pharmacokinetic course. In my preparation, I talked to the person responsible for the course, to learn how these tutorials usually run. I was told that students would do calculations in groups. At the end of the sessions, results are given on the blackboard by the teacher, as there is not enough time to ask the students to present the results for the rest of the class. I was told that the students often find it very difficult to do these exercises and calculations.

However, after teaching the first class (A), I was very surprised at how unprepared the students were. This caused some problems in my teaching, as I had to explain very basic things before we could proceed. I could hardly find time to help them all, it ended up being quite chaotic, and some of the students left the class long before it ended.

My aim was to make a critical reflection on pharmacokinetic tutorials and thereby suggest issues for changes and improvement.

Method

After teaching my pharmacokinetic tutorial class at the School of Pharmacy, University of Copenhagen, I had the time to re-prepare for the next two lessons. My peers attended the first lesson, for peer-supervision, and I had a follow-up meeting with them after the tutorial. Moreover, I had the chance to discuss issues with my pedagogical supervisor before teaching the next two lessons.

I realized that I would like to know what the students thought they gained from my teaching, so I wrote them an email via the course homepage, Absalon, and asked them to evaluate my teaching in a few words. However, I had no responses at all for a month. Some weeks later a female student wrote back and answered few of my questions.

I thus learnt that Absalon was not the way to gain knowledge on students' expectations and evaluations as they never replied. Therefore, I decided to construct a questionnaire to hand out before teaching began for the next two classes. Also to prepare the students in the other classes, I wrote them all an email via Absalon and explained what I expected them to do in preparation for our next pharmacokinetic class. They only had to read the email and were not required to reply.

Moreover, in my planning I decided to implement a few changes in the teaching. In order to evaluate the teaching, and to support my own ob-

servations, I constructed a questionnaire to gain knowledge on students' expectations and evaluation. From the collected data, I planned to make a critical reflection. Therefore, I used the method illustrated in figure 7.1.
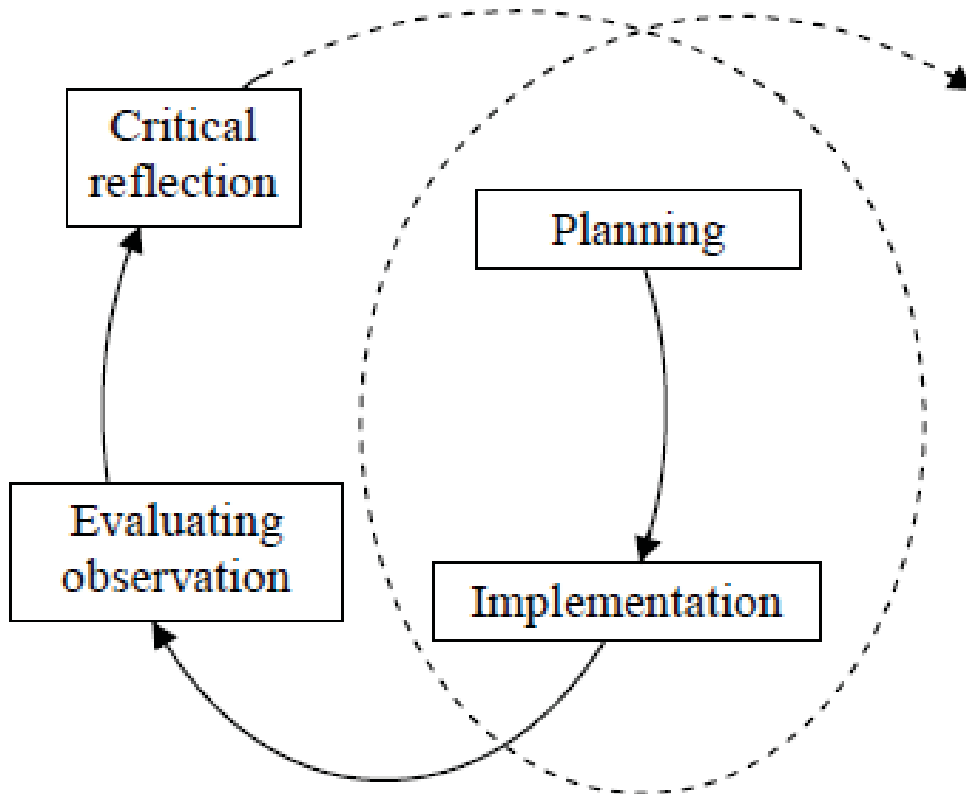

Fig. 7.1. Interaction between planning, implementation, evaluating observation and critical reflection. Thoughts on own teaching may lead to actions that are tested, but which upon critical observation is assessed as either to be discarded or improved. This means that an interaction is created between planning, implementation, evaluating observation and critical reflection, which is not only a circular process, but also a spiraling one moving in one direction finally to end in a focus or solution (Postholm 2011).

Planning

- After discussion with my pedagogical supervisor, I realized that I could use peer-teaching as a tool to activate those who already finished the assignments, and hereby to have better time to explain to those who found it really difficult.
- After discussing with my peers I decided to explain in details how the semilogarithmic plot should be made as I saw in the first lesson that this presented a lot of problems for the students, even though this is expected to be basic knowledge.
- I decided to hand out the graphs for the students so they could see what they should look like.
- I constructed a questionnaire to gain knowledge of students' expectations and their evaluation.

Implementation

I started the classes by introducing myself and my expectations as written in my email to the students via Absalon. I asked the students how many of them had read my e-mail before the class and how well prepared they were. I told them about peer-teaching and that both the student tutor and the tutee would benefit from it. I explained the semilogarithmic graph for the students and after the lesson I handed out the examples of the graphs.

After the lessons nineteen questionnaires were collected from one class (B) and twenty questionnaires collected from another class (C). The students were asked to fill in the first part of the questionnaire before we started the tutorial and to fill in the final part after the tutorial.

Results

In class B eleven of nineteen (58 %) and in class C six out of twenty (30 %) had read the email I sent out before the class.

Expectations

Two students in class B and five students in class C expected that the teacher would go through all exercises and demonstrate them on the blackboard.

Two students from class B and six students from class C would like to achieve skills which are necessary to pass the exam. Many (class B=9, class C=7) stated that they wished to achieve a better understanding of pharmacokinetics.

Students' preparation

Nine students from class B and twelve from class C did not do any exercises beforehand and very few managed to complete all the exercises on their own beforehand. Many students prepared for these classes by looking through the textbook, at slides from the general lecture or the assignments (class B=15, class C=13). One student pointed out that he or she did not prepare for class, as it was stated on the assignment sheet that the exercises would be done in the class.

Ten out of nineteen in class B and twelve out of twenty in class C would have prepared better for these tutorials, if they were to do it again.

Students' expectations

In class B ten students stated that their expectations were met. Three would have liked the teacher to have gone through the assignments at the blackboard. One student regretted that he or she was too unprepared for these tutorials.

In class C, fourteen students stated that their expectations were met. However, four of them also stated that there was too little time for the assignments and that it was too chaotic. One student was dissatisfied with the way of teaching and stated that, due to the fact that only a few students were prepared, it would have been better if the teacher went through all the assignments at the blackboard.

Student-reported outcome

All students reported positive outcomes such as better understanding of pharmacokinetics especially regarding one- and two-compartment kinetics and the difference between them.

Peer-teaching

This was not a theme in the questionnaire, these results are from my own observation. In class B, I specifically asked one student to help another and it seemed to go well. When I asked the former after the tutorials how he thought it went, he said that it is difficult to help someone who had not even read the book, but he tried his best. For explanation of assignment 2, I invited a student to the blackboard to explain the solution; it went well.

In class C, it was slightly more difficult to get the students to help each other. They had many questions and I was too busy to be able to encourage more peer-teaching.

Discussion – Evaluating observation

Other methods to provide understanding of teaching have been described (Postholm 2011). However, I found that the questionnaire was useful for the qualitative student evaluation and in combination with observations, I obtained a broad impression.

Aligned expectations?

I had to reconsider my teaching after my expectations of students' level of preparation were unmet. It is important that the tutorials are based on how well prepared the students are. However, after informing the students beforehand of my expectations, I still found a mismatch in expectations. Thus, I learnt that it is highly important to align expectations before the tutorials. This could be done in the general lectures, and the text on the assignment sheet should be rephrased to clarify expectations.

Basic knowledge and student preparations

How much time should a university teacher spend on repeating basic knowledge for the students? This is not an easy question to answer. Teaching the students how to draw the correct graph on a semi logarithmic plot met some problems and many minutes were spent on teaching this. These classes are not meant for such instruction, and it led to me having too little time to teach the actual exercises. Therefore, I would very much prefer ir if the plots were pre-drafted and given in the exercise. I am aware that drawing

these plots is included in these classes because it is part of the exam. However, I do not think that the students gain anything from drawing these plots. The point is that they should be able to interpret them. Therefore, I would suggest that the plots are provided both in classes and at the exam. This will give time for the things which are more important, including the exam situation, where time can easily be wasted in constructing these plots.

On the other hand, it should be possible to increase students' preparation for these tutorials. It could be stated on the assignment sheet, which skills are expected for these tutorials and perhaps some chapters could be recommended as reading beforehand. I got the impression that most of the students did not read anything in the textbook after the general lectures.

Peer-teaching

Both student tutor and tutee will benefit academically from peer-teaching, the tutor more than the tutee. Teaching a subject deepens students' understanding of it (Biggs & Tang 2007). However, even though I tried, I did not manage to optimize peer-teaching. I should have emphasized the importance and purpose of peer-teaching both before and during the classroom teaching. I could emphasize this on the blackboard by writing, for example, "Before you ask me, ask your peer or check your textbook".

Culture

The students are students in a number of different classrooms or activity systems. Therefore, they will experience several different ways of learning. Students from the Danish School of Pharmacy may be used to a culture where the teacher presents and talks, even when small classes are being taught. This may explain why some students preferred this teaching method. Another reason could be that if a student is less well prepared he or she is more likely to want the traditional form of teaching where the teacher presents all the solutions.

In both classes, I met opposition to the old fashioned logarithmic paper. I tried to explain the necessity for it. However, I did not have a really good argument, except that they had to be able to draw it in the exam as well. None of these students will ever again have to draw these graphs by hand. Therefore, I think it could be time to remove this task from tutorials and the exam. I think these graphs could easily be handed out to the students. The essential competence is that they are able to interpret the graphs, but I

think these skills can be obtained during tutorials without drawing graphs by hand. There would thus be more time for the actual assignment, as too much time was spent on drawing graphs.

Dealing with questions from students

Questions from students sometimes interrupted the classes, this was also reported by a few students. By increasing peer-teaching, I would have had more time for more important questions. Even though I tried to implement peer-teaching, it did not work out very well, as I still had a lot of questions to answer among the students. I have realized that I should have been better at appointing a peer student to raise the question to, or I should have told the students to try to ask a peer before raising their hands. On the other hand, it seemed as if they doubted the help a peer could give, and that they would prefer the teacher's answer. This may be due to the fact that they are not that much used to peer-teaching.

I would like to provide written solutions for the students immediately after the tutorials as they seemed eager to proceed at home to finish the exercises straight after the tutorial. However, I had the feeling that only a few of the students would be able to proceed without detailed solutions being provided. Therefore, I think it would be beneficial for the students to get solutions after each tutorial and not only when all the tutorials have been held, because at that time the eagerness to continue may have decreased. This was also reported by the students, who felt that more detailed solutions than those given on the blackboard were needed.

Conclusion

This assessment led to reflections on several issues. The most important ones are: (1) Expectations should be aligned for optimal teaching; (2) time should not be spent on repeating basic knowledge as semi logarithmic graphs, instead these could be provided and time could be spend on interpretation and deeper learning; (3) peer-teaching could be a way to increase students' activity and responsibility.