21

Communication between students and teacher

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Introduction

University education is usually taken like the one way teaching when
teacher is delivering the information and student is the recipient trying to
get as much as possible from the educational process. At least, this is the old
point of view, however, still persisting in some subjects and lectures. Mod-
ern way of university education is on more advanced level activating the
students and encouraging the application of their skills in learning process.
With less information, more effect and knowledge. Despite the enormous
development in the university pedagogic, there is still only minor expe-
riences and practical advices, and insufficient knowledge and sources for
learning large classes and delivering the pure fact science to the students.
Primary, this project was aimed on investigation of reasons causing the low
effect of well-prepared practical course on learning outcome. However, the
results were surprising enough (see experiment 1) to evoke the new inves-
tigation focused on the communication between teacher and students, not
only in the small groups but also in the large groups during theoretical lec-
tures (see experiment 2). The basic communication between student and
teacher is not personal. The educational process involved the teacher de-
livering and presenting the information (science) on one side, and students
elaborating and applying the information on the other. Independent on the
how simple and easy straight going this educational line may seem, there
are many problems, key points, curves and breaks which have to be consi-
dered in order to get the complete view on communication aspect between
teacher and students.

Within the many aspects, one appear to be crucial and probably more important than the others; belief of student in teacher and in skills to apply the knowledge, and vice versa: self-efficacy. Perceived self-efficacy refers to beliefs in one's capabilities to organize and execute the courses of action required to produce given attainments. Peoples belief in their efficacy have diverse effects. Such beliefs influence the courses of action people choose to pursue, how much effort they put forth in given endeavors, how long they will persevere in the face of obstacles and failures, how much stress and depression they experience in coping with taxing environmental demands, and the level of accomplishments. Efficacious people are quick to take advantage of opportunity structures and figure out ways to circumvent institutional constraints or change them by collective action. Conversely, inefficacious people are less apt to exploit the enabling opportunities provided by the social system and are easily discouraged by institutional impediments. Seen in the perspective of good teacher-student relation during the educational process, efficacious teachers believing in themselves and their skills to teach the science on one site, and efficacious students believing in the teacher's and their own skills on the other, are the best examples of successful communication during university study. We cant separate students from teachers and teachers from students. Both groups individually develop different patterns of competencies and deploy them selectively depending on the match of efficacy beliefs to environmental demands and on anticipated outcomes. Student are thus environment for teachers and teachers develop dependent on the students reactions and feedback.

Highly compatible communication between students and teachers represents the outcome of two incomes: i) efficacy beliefs and ii) outcome expectancies. The combination of these two factors may have particular effect and investigation of both aspects by teachers and students has a big potential for improvement of university education independent on, if the educational mechanisms are applied in small or large groups of students.

Results

Experiment #1

During my practical 2-days-course within the cell biology for the first year student of Veterinary Medicine, the student learn the basic molecular method of PCR. First, the students have theoretical lecture with professors

|		Outcome expectancies	
		-	+
Efficacy beliefs	+	Protest grievance social activism milieu change	Productive engagement aspiration personal satisfaction
	-	Resignation apathy	Self-devaluation despondency

Fig. 21.1. The effect of different patterns of efficacy beliefs and performance outcome expectancies on behavior and affective states. The pluses and minuses represent positive and negative qualities of efficacy beliefs and outcome expectancies.

where they go through the basic principles of the method as well as the basic structure of evaluated molecules. The lectures are very well prepared and performed. However, I have often the feeling, that the majority of the students did not comprehend the topic. So I go from student to student and individually explain the topic if they step into the problems. Anyway, not all of the students ask. Students were given simple questionnaire which was focused on evaluating the course and tools used in it as such, as well as, analysis of students personal impressions and experiences during course, followed by personal interview clarifying the uncertainness and discussing the possible relevant aspects:

1. Did you have laboratory experience before this exercise (handling pipets, knowing items names, etc.)?
2. In your opinion, did the lecture before the practical exercise give you sufficient preparation into PCR topic? (you knew, what's happening in the reactions)
3. Did you like to work with the booklet you had for the exercise?
4. Were the protocols easy to follow?
5. Were the questions in the book helping by understanding the PCR more in the depth?
6. Did you sometimes get "lost" in the book?
7. Did the teachers explain the topic so you could understand what is happening?
8. Did you ask every time you didn't understand something?

9. Would you prefer some other form of learning about PCR?
10. Which?
11. Can you say what PCR is now straight away?
12. Did you have a feeling that you understood what the PCR is about after the exercise?
13. Would you like to have more courses like this during your study?
14. Are you disappointed with something after your first (second) year at the University?
15. With what?

The results of experiment #1 showed general satisfaction of students with teaching, teaching tools as well as the outcome of the course. However, questions Q6, Q7 and Q8 aimed on communication between teacher and students gave partially negative answers. About 50% of students got lost in the protocols, however, they did not ask if they were confused or did not understand something. Students also got impression, that the course responsible (lab technician) could only more or less explain the topics and they would prefer to have more detailed introduction during the lecture.This result was moreover confirmed by personal interviewing of the random groups of students (notices can be delivered after requirements).
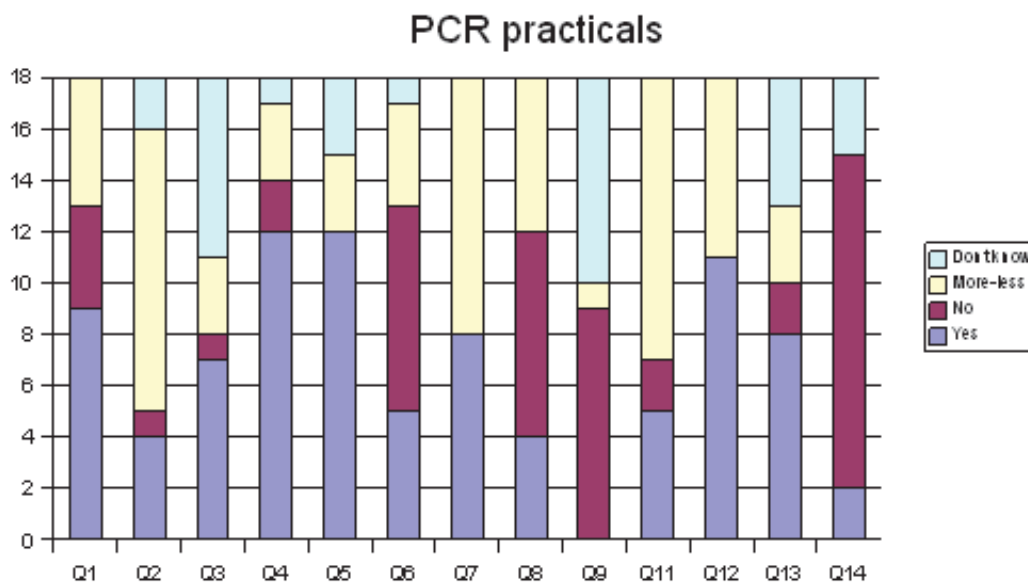
The logical conclusion from the first experiment was to perform further investigation aimed on communication between students and teachers. This

aspect is, in my opinion, the most important especially for the first year student struggling with different educational system and handling the information. Moreover, communication has a long-term impact on development of students (successful study and work applications) and teachers (improving teaching skills and personal attitude). From communication point of view, self-efficacy (could be also understood as a trust in each other to become better) seems to be a great tool for analysis of communication between students and teachers (Experiment #2). The detailed analysis could so help to improve the students-teachers interactions and significantly influence the educational process from student's and teacher's points of view.

Experiment #2

Experiment #2 was performed in the same group of students who were evaluated also during my lectures in big classes. Teachers included in the study were from IBHV, LIFE, KU. Teachers were given the STEB1 test for self-efficacy (modified from (Enochs and Riggs; 1990)) and students answered the modified STEB1 test aimed on their beliefs in teachers influence and beliefs in their own skills to learn (see Appendix A). Test contains reverse-polarity questions and is build from 2 focus area questions:

1. outcome: how far is the teacher able to modulate students learning
2. beliefs: how are the teacher's and/or student's beliefs in themselves to posses and apply the skills for successful learning

The higher total score, the better can teacher combine outcome and beliefs (better teacher). The higher score by students represents the better skills to accept the teachers input and the better use of personal resources to learn the science.

	Total (max 115)	Outcome (max 50)		Beliefs (max 65)	
	Average	Average	StDev	Average	StDev
Students (n=17)	80,29 (± 5,06)	34,88	4,08	45,41	4,62
Teachers (n=7)	87,86 (± 5,81)	33,86	2,97	54	4,4

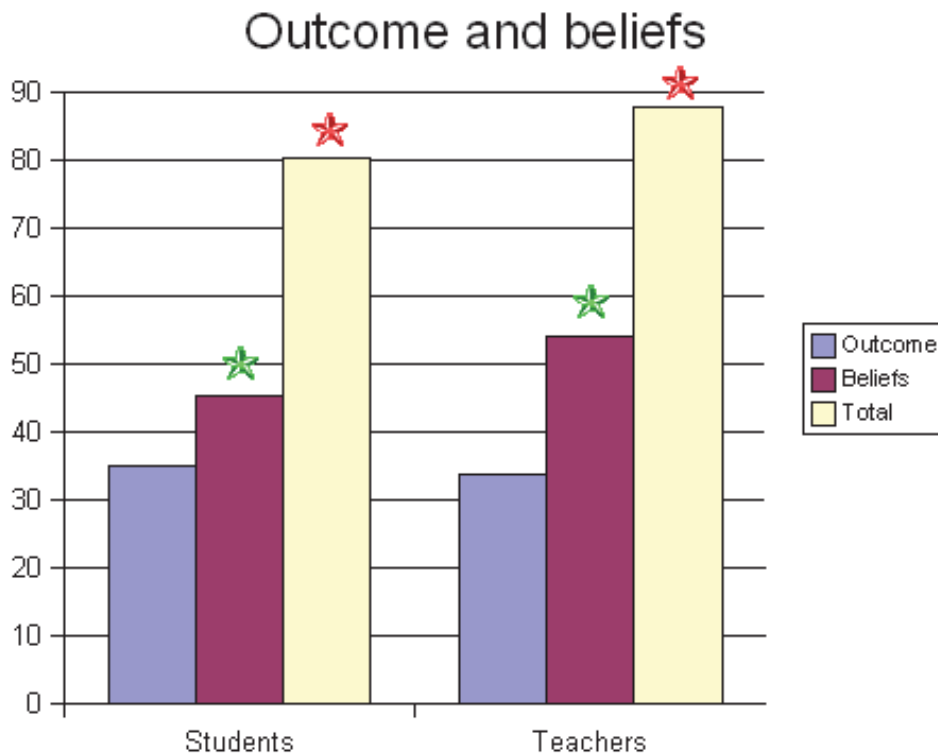**Fig. 21.2.** Outcome and beliefs of students and teachers

Fig. 21.3. Outcome and beliefs of students and teachers. Stars indicate the significant differences between students and teachers groups.

Despite the almost equal outcome expectancies, results from experiment #2 clearly indicate the significant differences in the beliefs potential between students and teachers what secondary influence also the total score. The study has shown that students have lower trust, beliefs in their own skills to be successfully applied for educational process. The teachers, on the other hand, believe in their skills and are also persuaded about the possible improvements of their teaching. Interestingly, the highest total score in teacher's group was 97 and the lowest 80; in the student's group the highest score was only 88 and the lowest only 74.

Conclusions and perspectives

University education, teaching and learning, are challenging parts of pedagogics. Practical investigations are usually performed in groups of variable

sizes (5-200 students), on students studying different subjects (e.g. human, natural, social sciences, etc.), in different countries and different systems. Therefore, generalization and global improvements steps are almost impossible and results of different investigations cant, in most of the cases, be applied world-wide. On contrary, exploration of university pedagogic can offer a lot of possible approaches and tools which can be use under any of the mentioned conditions. One of these tools is also self-efficacy evaluation which may be applied for both, students and teachers, in investigating different aspect of educational process.

The first part of this project aimed on practicals in small groups (18 students) disclosed a surprising fact about the partial failure in the communication between the students and their teachers. After elaborating different hypothesis in the questionnaire, only questions focused on communication presented partially negative answers. Even though, students were satisfied with the course, and could somehow understand the topic, they did not comprehend all the parts of the practicals due to the missing will to ask, communicate with the teacher. On the other hand, its never only one-way line. Incomplete feed-back from students, could indicate limitations in use of teacher's personal skills by approaching the individual students, which is clearly possible in the small groups. Logically, the results from the first part evoke the hypothesis about communication discrepancies and enable further investigation of communication level between student and teacher, especially in quite uniform basic veterinary education.

Good communication between teachers and students results in optimal activation of students and encourage them to deliver the feed-backs. Moreover, interactions becomes more effective consequently leading to increase in the belief in one's skills and creating optimal base for personal development of both sites. The STEB test used in the second part of the study was aimed on disclosing the beliefs in student's-teacher's skills to reach the goal (successful learning and teaching process) and the personal assessment of outcome expectancies depending on teacher's performance. As expected from the group of selected teachers who most of them have a long term experiences in the university teaching, average total score was 87,86%, what corresponds to the results of other relevant studies. Very interesting is the low average score of student's beliefs (45,41). Obviously, the first year students in veterinary study have the difficulties to believe in their own skills to perform successful learning which may hamper them by further development. On the other hand, we can assume that this insecurity may be eliminated after a few successful exams, and after the initial period when they

are getting used to study and learn in different environment. However, this fact, in my opinion, should be considered by scheduling the introductory course at the university. Resolving this "insecurity" may then have significant impact on communication between students and teachers later in the study and significantly influence the personal development of teachers and students.

Finally, we can conclude that the responsibility of the teacher is to support the communication with the students, guide them and encourage them to ask. This can in the high level influence their further development, as well as, help the teacher to improve skills used in university education.

A Appendix: STEBI1 test for teachers and students

The STEBI test is a valid and reliable tool for studying teacher's self-efficacy beliefs toward science teaching (Enochs and Riggs; 1990). The instrument presented below is a non-validated modification of the original STEBI test developed by Enochs and Riggs (1990). The modified STEBI test was developed by Robert Evans.

STEBI1 test for teaching efficacy - teachers

Please indicate the degree to which you agree or disagree with each statement below by circling the appropriate letters to the right of each statement

| SA | strongly agree | UN | uncertain | D | disagree |
| A | agree | | | SD | strongly disagree |

1	when a student does better than usual in science, it is often because the professor exerted a little extra effort	SA A UN D SD
2	I will continually find better ways to teach science	SA A UN D SD
3	Even if i try very hard, I will not teach my next science course as well as i will most science courses	SA A UN D SD
4	When the science grades of students improve, it is often due to their professor having found a more effective teaching approach	SA A UN D SD
5	I know the steps necessary to teach science concepts effectively	SA A UN D SD
6	I will not be very effective in monitoring science experiments	SA A UN D SD
7	If students are underachieving in science, it is most likely due to ineffective science teaching	SA A UN D SD
8	I will generally teach science ineffectively	SA A UN D SD
9	The inadequacy of a student´s science background can be overcome by good teaching	SA A UN D SD
10	The low science achievement of students cannot generally be blamed on their professors	SA A UN D SD
11	When a low-achieving student progresses in science, it is usually due to extra attention given by the professor	SA A UN D SD
12	I understand science concepts well enough to be effective in teaching tertiary science	SA A UN D SD
13	Increased effort in science teaching produces little change in students´science achievement	SA A UN D SD
14	The professor is generally responsible for the achievement of students in science	SA A UN D SD
15	students´achievement in science is directly related to their professors effectiveness in science teaching	SA A UN D SD
16	If others comment that a student is showing more interest in science at university, it is probably die to the performance of the student´s professor.	SA A UN D SD
17	I will find it difficult to explain to students why science experiments work	SA A UN D SD
18	I will typically be able to answer students´ science questions	SA A UN D SD
19	I wonder if i will have the necessary skills to teach science	SA A UN D SD
20	Given a choice, i will not invite my supervisor to evaluate my science teaching	SA A UN D SD
21	When student has difficulty understanding a science concept, i will usually be at a loss as to how to help the student understand it better	SA A UN D SD
22	When teaching science, i will usually welcome students questions	SA A UN D SD
23	I do not know what to do to turn student on to science	SA A UN D SD

STEBI1 test for teaching efficacy - students

Please indicate the degree to which you agree or disagree with each statement below by circling the appropriate letters to the right of each statement.

SA	**strongly agree**	**UN**	**uncertain**	**D**	**disagree**
A	**agree**			**SD**	**strongly disagree**

1	when I do better than usual in course, it is often because the professor exerted a little extra effort	SA A UN D SD
2	I will continually find better ways to study	SA A UN D SD
3	Even if i try very hard, I will not learn in my next course as much as i will most other courses	SA A UN D SD
4	When my course grades improve, it is often due to the professor having found a more effective teaching way	SA A UN D SD
5	I know the steps necessary to study veterinary science concepts effectively	SA A UN D SD
6	I will not be very effective in scheduling my learning process	SA A UN D SD
7	If I am underachieving in course, it is most likely due to ineffective teaching in the course	SA A UN D SD
8	I will generally learn science ineffectively	SA A UN D SD
9	The lack of my background in studied topic can be overcome by good teaching	SA A UN D SD
10	My bad course results cannot generally be blamed on my professors	SA A UN D SD
11	When a low-achieving student progresses in course, it is usually due to extra attention given by the professor	SA A UN D SD
12	I understand course concepts well enough to be effective in studying the topic	SA A UN D SD
13	Increased effort in course teaching produces little change in students´science achievement	SA A UN D SD
14	I am generally self responsible for the good results in the course	SA A UN D SD
15	My achievements in course are directly related to my professors effectiveness in teaching	SA A UN D SD
16	If others comment that a student is showing more interest in science at university, it is probably die to the performance of the student´s professor.	SA A UN D SD
17	I will find it difficult to understand the teacher explaining how experiments work	SA A UN D SD
18	I will typically be able to ask science questions in the course	SA A UN D SD
19	I wonder if i will have the necessary skills to learn veterinary science	SA A UN D SD
20	Given a choice, i will not invite my supervisor to evaluate my learning skills	SA A UN D SD
21	When student has difficulty understanding a topic, teacher will usually not be able to explain it	SA A UN D SD
22	When learning veterinary science, i like questioning in the lectures	SA A UN D SD
23	Professors do not know how to motivate student on to topic	SA A UN D SD