

EDUCATION

Teaching pathophysiology at Poznan University of Medical Sciences, Poland

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Poznan University of Medical Sciences, which was founded in 1920, belongs to one of the oldest medical universities in Poland. Currently, Poland has 12 medical universities and 5 medical faculties at other universities, where 7,800 medical students study. Our university has about 7,200 students and is comprised of the Medical, Pharmacy, Dentistry and Public Health Faculty.

I am an associate professor at the Department of Pathophysiology. About six years ago I returned to Poland after my work, at first as a post-doc JSPS fellow and later as an assistant professor, at the Aichi Medical University in Japan. The goal of the study I was working on at the Aichi Medical University was to investigate the influences of seasonal changes of natural illumination and temperature on the immune, hormonal and autonomic nervous systems (Kanikowska et al., 2013, 2012, 2010, 2009). I am currently continuing this research, concentrating on diurnal and seasonal rhythmicity (Kanikowska et al., 2015, 2019). As part of my daily work, I am responsible for my research as well as medical education for our students.

Pathophysiology is a rapidly evolving science and our main goal is to understand and teach our students how the body functions and reacts in an unhealthy state. It is crucial to implement the newest techniques and methods of teaching this ever-changing subject, in order to prepare our fu-

ture physicians. Each year, our department teaches pathophysiology to about 900 students, including 490 from the medical program. Of those, about 340 are from the Polish medical program, while 150 students are from the international program taught in English. In recent years, the number of our students has significantly increased.

The Pathophysiology course is held during the 2nd year of medical school. It consists of 18h of online lectures, 14h of general seminars and 38h of small group seminars. The Department of Pathophysiology at Poznan University of Medical Sciences has enthusiastic, professional and well-educated staff, who's eager to share their knowledge with students determined to become great physicians. The goal for teachers is not only to present the problem but to develop the necessary critical thinking in the student, which will allow him or her to solve it by linking theory and practice. Furthermore, by creating a positive atmosphere for learning, our students have a positive reinforcement in their thirst for knowledge.

A pleasant learning environment for students is comprised of supervision with continuous feedback (also by e-learning) and a trustful atmosphere, including interactions with the teacher so that during the meetings our students feel comfortable taking part in the discussions.

Although there are many similarities, there are

Table 1. Schedule of Department of Pathophysiology

	Number of students	Number of lectures	Number of seminars/ small group discussion	E-learning	Experimental classes
Department of Pathophysiology (Poland)	490 (340 Polish language course + 150 English language course)	18	14/38	yes	no



Fig. 1. E-learning portal of the Department of Pathophysiology at Poznan University of Medical Sciences, Poland created, administered and managed by the Department of Pathophysiology (www.student.ump.edu.pl)

also many differences in the work I have done in both universities. First of all, the number of students differs significantly between both universities. In recent years, the number of medical students increased in Poland due to the need to increase the number of medical doctors. Currently, the average age of a medical doctor in Poland is 50 years old. Furthermore, there are about 2.3 medical doctors per 1,000 inhabitants, one of the lowest numbers in the European Union. Because of the upsurge in students, the number of teaching hours also increased, which lead to the faculty working overtime. The required teaching hours for the academic year for an associate professor is 210 hours, for a lector 360 hours and a professor

150 hours (Table 1).

Computers are increasingly used in medical education. In recent years, my department implemented the “flipped teaching” method (Roszak & Kołodziejczak, 2017). This technique involves the access of online lectures (e-learning) to the student before class, while class time (seminar) is instead spent discussing the learned material. Students are required to complete the online presentations and perform multiple choice quizzes which covered the online lecture content (Fig. 1).

Electronic learning (e-learning) is moving education from the textbooks to the electronic format (that are frequently enhanced by the use of multimedia aides), which allows for a truly inter-

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 Uniwersytetu Medycznego
 im. Karola Marcinkowskiego
 w Poznaniu

ESTUDENT PORTAL
 Department of Pathophysiology, Poznan University of Medical Sciences

Home Groups Learning resources Pathophysiol...

Pathophysiology 4MD_19
 Rules
 Curriculum
 Syllabus
 Notifications
 Forum
 I, II
 III, IV
 V
 Lecture 30.05
 V.1 Lecture
V.2 Lecture
 Va, Vb, Seminar
 For CASES
 Comments
 Respi: Self-test
 Cases for test 11
 PDF
 Question to Teacher
 Points
 VI
 VII
 TESTS
 Enrollment-FINAL
 EXAM
 Problems with portal

V.2 Lecture
 Respiratory system 2
 Pathophysiology of respiratory system. The lung diseases - part 2

My learning groups
 ALL-4_2019

General
 Detailed view
 Notes
 Set bookmark
 Evidence of achievement
 course participants

Pathogenesis of parenchymal lung injury leading to restrictive lung disease.

A, Injury, which may directly damage the alveoli

B, The reaction to injury

40

iSpring 40 / 53 00:00 / 00:00
 Created with iSpring

Fig. 2. E-learning course for second year MD students. My lecture- “Pathophysiology of respiratory system”.

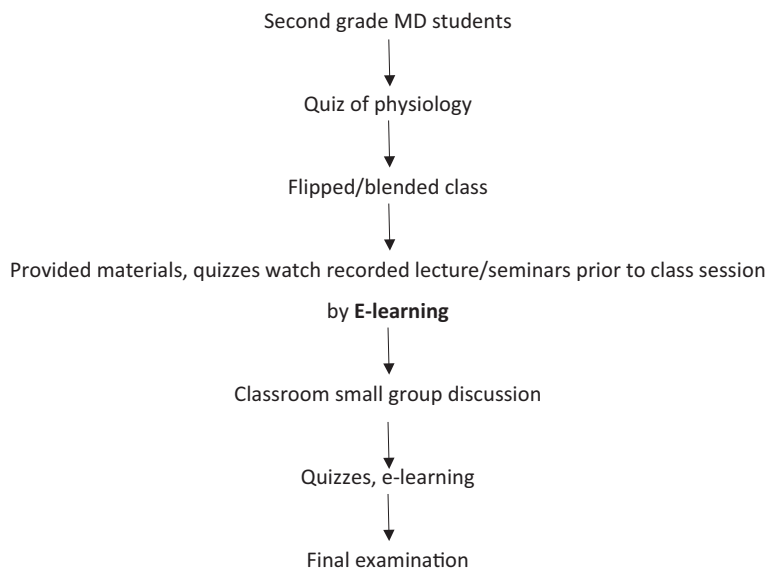


Fig. 3. Chronology of educational modalities provided to students in flipped/blended pathophysiology course.

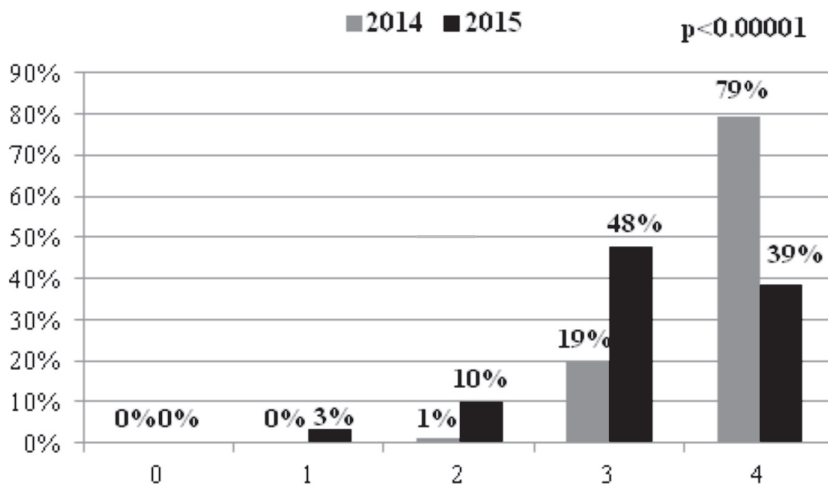


Fig. 4. Usefulness of e-learning portal (answers by our students). A scale from 0 (strongly disagree) to 4 (strongly agree). (Roszak et al., 2015).

active medium that can be delivered to meet the educational needs of students and postgraduates (Roszak et al., 2016).

Studies show that by combining e-learning with instructor-led lessons (also called blended learning), an individual's learning efficiency dramatically increases. Since students already know the fundamental concepts, teachers can spend more quality time focused on relevant examples and case scenarios.

Seminars are held in small discussion groups (about 10-15 students). Due to high students' number, it requires the same subjects of the seminar to be repeated several times by the teacher. Seminars in small discussion groups improve active learning and enhance students' scores on the post classes quizzes. The small number of students allows them to be more engaged in conversations by having a better opportunity to express their opinion. Students are encouraged to act as active subjects in the teaching-learning process, not just as mere spectators. Evaluation of the effectiveness and student performance is achieved by having students take multiple-choice examinations after the pathophysiology course. At the be-

ginning of the class, a physiology quiz and at the end of the course a pathophysiology quiz is completed by the students, and their scores are 25% to the final course grade (Fig. 3).

The student evaluations of our course have been extremely positive, and the department has received several awards from the university. We are very appreciative for the feedback from our students about any changes that they deem necessary in the e-learning materials or teaching techniques, that will make it more useful Fig. 4.

Therefore, graduating medical students believe that pathophysiology is highly relevant and essential to their clinical training. In conclusion, according to our experience, e-learning (flipped/blended learning) is very effective in teaching pathophysiology and could be used in teaching other medical subjects.

References

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2. Roszak M, Kołodziejczak B, Półjanowicz W, Bręborowicz A, Ren-Kurc A & Kowalewski W: E-learning portal tools for medical education. *Studies in Logic, Grammar and Rhetoric* 43 (56) Issue (2015) on Logical,

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ポーランドでの病態生理学教育についての執筆原稿のご紹介

今回、ポツナン医科大学医学部病態生理学講座において准教授として教鞭をとっておられるドミニカ カニコフスカ先生にポーランドでの医学部教育について執筆していただきました。ドミニカ先生は 2006 年に学術振興会の特別研究員として、愛知医科大学生理学講座(旧生理学第二講座)にて研究を行ったのち、同講座助教として、生理学の実習と講義に携わりました。日本では、ポストドク時代から生理学実習にて学生の指導を行っており、心電図測定、心臓機能(フランク・スターリング機構およびスタニウスの結紮実験)、腎機能測定、呼吸機能測定など多岐にわたる項目において学生の指導を行ってまいりました。ドミニカ先生の英語での講義(生体リズム)は印象的であったようで、研修医を終え医師としてバリバリと働く卒業生から、あの頃は懐かしいとドミニカ先生の話になったこともあります。

ポーランド医学部には生理学の科目の他に病態生理学という単独の科目があり、講義のほか、セミナー形式の授業が行われています。また、反転授業(先に予備学習として自宅にて Quiz を解いてもらい、講義・セミナーに入る)、e-learning も取り入れ、学生教育には力を入れており、大学内の賞も受賞した講座と聞いております。

今回、日本での医学教育の経験を踏まえ、ポーランドでの医学教育(病態生理学)について執筆いただいております。ポーランドでは学生数(医学部 1 学年 490 名)が多く、また、少人数でのセミナー形式の授業が多いため、教員一人当たりの負担は日本とは比にならないことがわかります。日本での研究・教育経験の後、ポーランドにて活躍しているドミニカ先生をご紹介させていただくことを大変光栄に思います。最後に、執筆のご提案をいただきました日本生理学会教育委員会に御礼申し上げます。日本の教育とポーランドの教育を知るドミニカ先生に執筆していただいております。ご提案があり、執筆を依頼するに至りました。

(愛知医科大学医学部 IR 室/生理学講座 佐藤麻紀)

「教育のページ」は学部学生、大学院生、ポストドク、教員などを対象に、生理学教育に関する取り組みや意見を紹介することを目的としています。原稿は Web (日本生理学会ホームページ) 上にも掲載されます。皆様のご投稿をお待ちしています。投稿規程は http://physiology.jp/magazine/contribution_rule/ をご参照ください。