The medical education at FICSAE relies on Team-Based Learning (TBL), skills laboratory, hospital practice, lectures and active dialogues through contextualised exercises. The initial concern was how to ensure the assessment of readiness for the TBL sessions, and the assessment of learning was achievable online during the outbreak.

2 | WHAT WAS TRIED?

The Faculty Development Committee and the Dean of FICSAE aligned coordinators and instructors to develop and promote a framework to guide online teaching and learning. The team responsible for teaching surgery adapted their activities following three strategies: (a) active online lectures, (b) video exhibitions followed by team activities and 3) team assessment based on clinical scenarios as a surrogate of TBL assessments. Here, we describe these three strategies.

The active online lectures consisted of slide presentations and question times. At every 10 to 15 minutes, the lecturer would present a question to the students to be solved in groups (group discussions occurred via the breakout rooms). These interspersed exercises took approximately 5-10 minutes (5 minutes for group discussion and 1-2 minutes for answers and feedback).

The video exhibitions followed by activities were based on short movies of procedures available from non-restricted Internet sites or produced by the FICSAE instructors. After watching each video with the instructor, a short session of questions and answers to clarify the procedure followed. Then, the students worked on questions in groups. The questions were directly related to clinical scenarios where the procedures may or may not be indicated, as well as questions related to the procedure, step-by-step.

The TBL assessment based on clinical scenarios consisted of cases and questions presented to the students to solve altogether. This was considered a formative assessment. Following this session, the students were asked to solve a new clinical case in groups within a week after class. We consider this approach as the differential learning activity as the students were asked to provide references from the literature to support their responses. We believe that this approach enhanced the students’ awareness of the literature, their ability to search for a focused answer and their critical analysis of the literature.

3 | WHAT LESSONS WERE LEARNED?

The most interesting results of this arrangement were the high retention and receptiveness of students during the sessions (120 minutes in length), the consistency of references to support the students’ discussions and the two well-received summative tests that relied on the same approach as the TBL assessments. The two summative tests were clinical case-based short answer questions. These questions are an example of the analytic framework. The students achieved high grades compared with the regular process of the past. Grades were not maximal and showed distinctiveness among the groups as the best-referenced responses were associated with better grades.

ORCID
Joaquim Edson Vieira https://orcid.org/0000-0002-6225-8985

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Dear MD: Physics can be useful (and fun, too)!

Daniel Dziob | Bartosz Lisowski | Tomasz Rok | Karolina Wójcik-Piotrowicz | Grzegorz Tatoń

Correspondence: Daniel Dziob, Department of Biophysics, Jagiellonian University Medical College, Sw. Lazarza 16, Krakow 31-530, Poland. Email: daniel.dziob@uj.edu.pl

1 | WHAT PROBLEMS WERE ADDRESSED?

Physics is everywhere—this is a typical opening address of any elementary physics course. Medical students usually think quite the opposite. Both views are justified, but we believe that in the age of technological revolution medical professionals should acquire at least limited, yet solid knowledge about the underlying principles of physiology, medical imaging, diagnostics and therapy. This
will broaden their perspective and benefit their patients. Therefore, teaching physics to medical students requires not only a suitable choice of a content knowledge (what to teach?), but also careful approach, properly selected teaching methods and appropriate language (how to teach?).

2 | WHAT WAS TRIED?

Biophysics is often taught to medical students in the same way, as to physicists, with a focus on physical phenomena, usually totally unrelated to medicine, full of formulas and calculations. Without proper understanding of mathematics, they do not build the practical knowledge. To address this issue, we developed a biophysics laboratory for medical students, consisting of 10 experiments related to the diagnostic methods or human physiology:

- digital subtraction angiography, in which the influence of time exposition and contrast agent on the quality of the obtained X-ray images is examined;
- electrocardiography, in which basic principles of measuring the electric potential difference between limb leads and data analysis of R-R intervals are introduced;
- pharmacokinetics, which utilises a simple multi-channel pump, water and salt to demonstrate exponential decay dynamics and principles of blood glucose test;
- haemodialysis, introducing students to diffusion, osmosis and transport phenomena with a real artificial kidney system;
- tonometry, designed around intraocular pressure, correlation and causation;
- model of the inner ear, where properties of sound wave, Fourier transform and the mechanical principles of the inner ear are examined;
- cardiovascular system model, where Hagen-Poiseuille law is utilised to calculate model system vascular resistance;
- respiratory system, where operating mechanical lung model allows for measurements of pressures and flows, explaining the principles of plethysmography and spirometry;
- ultrasonography, in which self-designed phantoms demonstrate and explain physical principles of ultrasound wave behaviour, image acquisition and artefacts;
- bone elasticity, where Young moduli of bones and commonly used metals, that is brass, steel and titanium are being measured during a three-point flexural test, and biomechanics of implants is discussed.

Each experiment takes 135 minutes, is performed by students in groups of two or three and emphasises physical principles, which could be useful in their future career.

3 | WHAT LESSONS WERE LEARNED?

For the past 5 years, more than 1500 students participated in the biophysics laboratories. Based on their anonymous opinions, expressed in the university system (USOS) surveys after the semester, and personal communication, we conclude that:

- physics might be interesting for medical students, if it is shown in the context of physiology, diagnostics or therapy, that is authentic medical applications;
- students understand what they can see and examine by changing one parameter at a time;
- physics helps to understand the complexity of functioning biological mechanisms, which are sometimes too complicated to figure out from medical point of view.

ORCID

Daniel Dziob \(\text{https://orcid.org/0000-0003-2065-600X}\)
Bartosz Lisowski \(\text{https://orcid.org/0000-0003-1444-4924}\)
Tomasz Rok \(\text{https://orcid.org/0000-0003-3846-3900}\)
Karolina Wójcik-Piotrowicz \(\text{https://orcid.org/0000-0003-0071-0558}\)
Grzegorz Tatoń \(\text{https://orcid.org/0000-0001-7777-6892}\)

REFERENCE

1. Description and instructions for the exercises are available here: \text{http://biofizyka.cm-uj.krakow.pl/index.php?menu=teaching&lang=en and upon request.}