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Teaching methodology in system of medical education

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КОМБІНОВАНІ ТА ІНТЕРАКТИВНІ ТЕХНІКИ ВИКЛАДАННЯ АНАТОМІЇ ЛЮДИНИ ІНОЗЕМНИМ СТУДЕНТАМ

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AN INTERACTIVE AND COMBINED TECHNIQUES' APPROACH TO TEACHING HUMAN ANATOMYTO FOREIGN STUDENTS

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Попелюк О.-М. Комбинированные и интерактивные техники преподавания анатомии человека иностранным студентам. Современный мир - глобальная экономическая, технологическая, историческая и социальная многокультурная система. Образование непосредственно определяет судьбу общества, его жизнеспособность и будущее развитие. Анатомия является основой для всех медицинских и смежных медицинских специальностей и обеспечивает формирование клинического мышления. **Цель исследования.** Целью исследования было изучить применение интерактивных методов обученияв сочетании с классическими методами, такими как препарирование, в курсе анатомии человека для студентов первого курса БГМУ. **Материал и методы.** Исследование было проведено в конце второго модуля «Центральная нервная система и органы чувств» на кафедре анатомии человека им. М. Г. Туркевича для студентов первого курса 3 медицинского факультета Высшего государственного медицинского учреждения Украины «Буковинский государственный медицинский университет» Черновцы, Украина. В исследовании участвовали 75 студентов. Шесть 2-х часовых занятий проводились с группами около 20 студентов по методикам мозгового штурма, "боди-арта" и викторины в сочетании с препарированием. **Результаты и обсуждение.** После сравнения результатов сдачи модуля студентов, участвующих в исследовании и тех, которые не принимали участия, обнаружена существенная разница в показателях успеваемости, с достоверным повышением среднего балла для участников исследования. **Выводы.** Полученные результаты указывают на то, что сочетание нескольких методов интерактивного обучения является эффективным способом преподавания анатомии студентам и способствует лучшему усвоению материала и длительному его сохранению в памяти учащихся.

Ключевые слова: анатомия человека, интерактивные методы, комбинированный подход к обучению

Introduction. The modern world is a global economic, technological, historical and social multicultural system. The education directly determines the fate of a society, its viability, and future development[1]. The level of knowledge and the qualification level of a specialist influences on the reputation of a particular institution, which provides a unique educational service used by future doctors. Strengthening of the foundations of the state, the pursuit of democratization and humanization of all areas of public life, the desire to integrate into the European and global society require new conceptual approaches in education in general and fundamental subjects in particular[2].

Knowledge of anatomy is an important part of medical practice, with an absence leading to errors in identification of anatomical structures. Anatomy underpins all medical and allied health professional education informing clinical reasoning. Indeed, the consequence of less-than-optimal anatomy education is the graduation of incompetent health-care professionals[3]. Learning by lecture is a passive experience in which little processing occurs between the ear that hears and the finger that writes[4]. In order to achieve optimum anatomy education, cadaveric dissection (dissection of a dead human body) is mandatory in the majority of medical schools and perceived as a fundamental part of medical training. Because of current arguments on balancing learning outcomes, problems related to the use of human cadaver, teaching methods and resources, education in anatomy has introduced a shift toward greater use of alternative modes of teaching involving books, videos, cadaveric plastination, non-cadaveric models and computer-based imaging[5]. Although efforts have been made over recent years to promote the introduction of new techniques to stimulate students to assume a more active attitude toward learning[6], such techniques seem not to have had a significant impact[7] especially

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on foreign students. In particular, the introduction of interactive techniques into basic science education has been especially controversial, an area where a stronger disposition toward classic teaching techniques often exists among teachers[8].

Aim of the study. In this study, the application of an interactive learning technique, namely body painting, brainstorming and quizzes combined with classical methods such as dissectionto the teaching of anatomy to first-year medical students is outlined, and the results of an evaluation study aimed at exploring the students' views on this teaching approach are reported.

Material and methods. The study was carried out at the end ofthe second module "Central nervous system and sensory organs" in anatomy of the first-year medical curriculum in Mykola Turkevich Department of human anatomy of theHigher State Educational establishment of Ukraine "Bukovinian state medical university" Chernivtsi, Ukraine. A total of 75 studentsparticipated in the survey. Six 1.5-hours sessionswere conducted with groups ofapproximately 20 students and werededicated to brainstorming, body painting and quizzes combined with dissection on threetopics: central nervous system, cranial nerves and sensory organs.

A pilot anatomy workshop in combination of interactive methods, with 27 undergraduate anatomy students, representative of 3rd medical faculty was conducted in 1st Term 2017. Elements of the pilot workshop were based on curricular content while the learning activities incorporated visual and tactile learning techniques not currently utilized in the anatomy units of study[9]. We used a range of open and closed questions in a survey to capture students' feedback on the elements and the practicalities of the workshop and their learning style preferences. The feedback was utilized to refine and optimize the final proposed strategy. All participants provided written consent to participate and the use of their examination results for the study.

One activity was dedicated to body painting with water -based face and body paints. Participants painted bones of the viscerocranium, muscles of mastication and facial expressions, cutaneous nerve distributions on each other guided by anatomy atlases and textbooks[10]. Expertise in body painting was not the focus, but students were encouraged to be detailed in morphologic features rather than being artistically creative.

In each session we provide students with a 40-min lecture accompanied by anatomical demonstrationof the gross anatomy of a prosected adult human brain, or a specimen of a certain part of the head with clearly visible superficial and deep structures (nerves, arteries andveins, muscles of facial expression). A bony cranium with the calvaria removedis also used to more clearly demonstrate the osseous morphology, particularly the cranial nerve foramina. This enablesstudents to observe the particular structures and also breaks up the lecture presentations by providing a welcome counterpoint. Also each student dissects one or more fresh porcine eyes exploringand identifying the attached anatomical adnexa and surfacestructures of the globe while also focusing on gaining eventual access to the internal anatomy of the eyeball. Afterwards students brainstormed the functional applications of the relevant anatomy. Finally, the fourth activity required participants either individually or in groups to undertake quizzes and to complete tables and schematic figures related to functional and clinical applications. Students were free to move between the four activities during the session.

The main steps of brainstorming thatwe used in our application toanatomy teaching were the following. The group of participants was divided into subgroupsof four to six people to increase participation of each student. Each subgroup nominated a representative speaker to feedback to the larger group. The teacher then stated the questions on which the subgroups had to answer.

Results and their discussion. At the conclusion of the workshop, students immediately completed a paper-based post-workshop survey. This survey evaluated: a) the usefulness of the workshop in consolidating the material learned during the semester b) whether their attendance at the workshop achieved their goals stated in the baseline survey, c) their post-workshop self-perceived confidence with the topics of neuroanatomy and d) overall satisfaction with the anatomy workshop.

And another survey was administered four weeks after the workshop, following their final examinations but prior to receiving any results. This survey assessed the participants' self-report of the workshop's usefulness in examination preparations as well as performance.

We compared the results of the module 2 examination (it consisted of multiple-choice questions, dissection-based examination testing identification of anatomical structures and their functional applications and theory examination covering the entire module content) in attendees and non-attendees. With the significantly different baseline module results indicate a significantly different indices between groups, with an increase in mean scores for the attendee cohort and a decrease in the non-attending cohort. All paricipants (100 %) reported that their goals for attending the anatomy workshop were attained. The main stated goals were the following: 1. Understanding content (62/75) ‑ the majority of participants acknowledged that anatomy was more than just memorization and wanted to engage with the structural anatomy to understand concepts, functional applications and possible clinical relevance; 2. Getting some alternative approaches to the anatomy subject (31/75); 3. Examination preparation (27/75) ‑ some participants attended the workshop to improve their examination performance. The workshop was perceived as an opportunity to up-skill in examination technique and undertake structured revision; 4. Increase self-confidence (11/75) – a small amount of students perceived that their performance would be enhanced by improving their confidence with the content.

Undertaking this innovative, interactive workshop significantly improved the examination performance of attendees compared to non-attendees.

Body painting and clay modelling were reported to be the most useful components of the anatomy workshop, closely followed by the quizzes and white-boarding. Previous research has suggested the usefulness of body painting

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and clay modelling in increasing student engagement as well as consolidation of anatomy[11]. Not only would the findings from this study support these claims, but that it must be highlighted that these learning tools would be valuable for healthcare students whose preferred learning style involves visualization and kinesthesia. Some students reported that the quizzes helped them to identify areas of knowledge deficit and to consolidate existing knowledge.

As anatomy underpins all healthcares, the purpose of anatomy as core learning for healthcare professionals is to provide the student with tools to assist clinical reasoning. Spatial ability or appreciating the spatial orientation of the various anatomical structures is an essential skill for health professionals. This spatial ability, practiced by the body painting and modelling components in the workshop, compliments and value-adds to existing teaching on three-dimensional cadavers, potted specimens, living and plastic models as well as two-dimensional imaging and texts/ atlases, which can be transferred to the diagnosis and management of the patient. The clinically case-oriented quizzes and table/figure completion tasks facilitated the blending of academic learning with real-world applications, assisting the student to situate new knowledge with cognitive schemas to be recalled in later academic and clinical scenarios[12].

Conclusions. The study of anatomy is the basis of medical education. There has been ongoing discussion and debate over the best ways in which to teach anatomy to both first-year medical students as well as more senior medical students and residents during the earlier stages of their residency training. Naturally, a final conclusion on theeffectiveness of any teaching techniquecan only be drawn on the resultsof a randomized controlled trialthat compares its outcome with thatof similar trials; thus, this study has tobe considered just the first step. Nonetheless,our data are very encouraging,because they demonstrate thatmost students view our teaching approachas both interesting and useful.Many successful innovative teachingtechniques have been applied toimprove anatomy courses by means ofinteractive learning (Fitzgerald, 1992;Scott, 1993, 1994; Cliff and Wright,1996; Teichgraber et al., 1996; Drake,1998; Fasel, 1998; Fasel et al., 1998,1999; Giffin and Drake, 2000; Tutarelet al., 2000; Carlson, 2002; Drake etal., 2002; Haines et al., 2002; Heidgeret al., 2002; Reidenberg and Laitman2002; Miller et al., 2002)[13]. Our experiencealso indicates that the combination of several techniquescould represent aneffective way to induce interactivelearning to anatomy students. Assisting in development of generic professional attributes, the workshop may be a valuable addition to traditional anatomy learning and teaching in the health sciences.

Future recommendations. Future studies should include a larger experimental cohort, case-matched for course, age, gender and importantly for baseline examination performance. Further research is needed to determine whether such a workshop would be beneficial to the academic performance of all students. Scheduling a second workshop in the later years of medical and healthcare study may enhance longer-term knowledge retention. This may be useful revision for clinical practice but will require further investigation[14].

Попелюк О.-М. Комбіновані та інтерактивні техніки викладання анатомії людини іноземним студентам. Сучасний світ ‑ це глобальна економічна, технологічна, історична та соціальна багатокультурна система. Освіта безпосередньо визначає долю суспільства, її життєздатність та майбутній розвиток. Рівень знань та рівень кваліфікації фахівця впливає на репутацію певної установи, яка виконує унікальну освітню роботу, що використовується майбутніми лікарями. Знання анатомії є важливою частиною медичної практики, відсутність якого призводить до помилок у ідентифікації анатомічних структур. Анатомія є основою для всіх медичних та суміжних медичних професійних спеціальностей і забезпечує формування клінічного мислення. Наслідком недостатньо адекватної анатомічної освіти є випуск некомпетентних медичних працівників.

Мета дослідження. Метою дослідження було вивчити застосування інтерактивних методів навчання, а саме "боді-арту", мозкового штурму та "вікторини" у поєднанні з класичними методами, такими як розтин, під час викладання анатомії студентам першого курсу БДМУ та дослідити думку студентів щодо використання даного підходу до навчання.

Матеріал і методи. Дослідження було проведено в кінці другого модуля «Центральна нервова система та органи чуття» на кафедрі анатомії людини ім. М. Г. Туркевича для студентів першого курсу 3 медичного факультету Вищого державного медичного закладу України «Буковинський державний медичний університет» Чернівці, Україна. У дослідженні взяли участь 75 студентів. Шість 2-годинних занять проводилися з групами близько 20 студентів за методиками мозкового штурму, «боді-арту» і вікторини в поєднанні з розтином та препаруванням за трьома темами: центральна нервова система, черепно-мозкові нерви і органи чуття.

Результати і обговорення. Після порівняння результатів складання модуля студентами, що приймали участь в дослідженні та тих, що не брали участі виявлено суттєву різницю в показниках успішності, з достовірним підвищенням середнього балу для учасників дослідження.

Висновки. Отримані результати вказують на те, що поєднання кількох методів інтерактивного навчання є ефективним способом викладання анатомії студентам та сприяє кращому засвоєнню матеріалу і тривалішому його збереженню в пам'яті. Ми вважаємо, що сучасні інтерактивні методи є цінним доповненням до традиційного викладання в галузі наук про здоров'я.

Ключові слова: анатомія людини, інтерактивні методи, комбінований підхід до навчання

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