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DEVELOPMENT OF PRACTICAL LESSONS IN MICROBIOLOGY BASED ON THE CASE-STUDY METHOD

Nazarov Jalolitdin Sulton Erkinovich, Sharipova Madinabonu Akramovna

Bukhara State Medical Institute named after Abu Ali ibn Sino

✓ *Resume*

The case-study method is a learning system that is based primarily on the analysis and solution of certain practical situations that a student may face in his further real professional activity.

The case-study method does not have an exact analogue of the translation into Russian. A frequently used translation of this term, especially in medical schools, is situational tasks.

Training on practical examples (situations) has existed since ancient times, for example, to educate boys in commanding skills in ancient Sparta, they used the description of specific battles and their analysis.

Nevertheless, officially, as a teaching method, case study was applied in 1924 at the Harvard Business School. It was there that her teachers and students were faced with the fact that they could not learn the practice of management and doing business in real life with the help of existing textbooks.

Conversations with leading business practitioners have replaced textbooks. Based on these interviews, detailed reports (descriptions of situations) were created on the solution of certain practical cases by leading business managers. This is how the case study technique was first born.

At the moment, the case-study method is considered one of the best methods for the development of analytical thinking, a critical approach to solving a particular problem, as well as creativity. It should be noted that the case study has proven its effectiveness in distance learning. Thus, the use of this method can be beneficial when used in practical classes for students of medical and other universities.

Keywords. Case-study method, educational clinical game, small groups, assessment cases in microbiology.

РАЗРАБОТКА ПРАКТИЧЕСКИХ ЗАНЯТИЙ ПО МИКРОБИОЛОГИИ НА ОСНОВЕ
КЕЙС-МЕТОДА

Назаров Жалолитдин-Султон Эркинович, Шарипова Мадинабону Акрамовна

Бухарский государственный медицинский институт имени Абу Али ибн Сино

✓ *Резюме*

Кейс-стади это система обучения, которая базируется прежде всего на анализе и решении тех или иных практических ситуаций, с которыми учащийся может столкнуться в своей дальнейшей реальной профессиональной деятельности.

Кейс-стади не имеет точного аналога перевода на русский язык. Часто используемый перевод этого термина, особенно касательно медицинских ВУЗов, это ситуационные задачи.

Обучение на практических примерах (ситуациях), существует с глубокой древности, например, для воспитания полководческих навыков у мальчиков в древней Спарте использовали описание конкретных битв и их анализ.

Тем не менее, официально, как метод обучения, кейс-стади был применен в 1924 году в Гарвардской школе бизнеса. Именно там её преподаватели и студенты столкнулись с тем, что не смогли с помощью существующих учебников научиться практике управления и ведения бизнеса в реальной жизни.

Заменой учебникам стали беседы с ведущими практиками бизнеса. На основе этих интервью были созданы подробные отчеты (описания ситуаций) о решении тех или иных практических случаев ведущими бизнес менеджерами. Так впервые зародилась методика кейс-стади.

На данный момент кейс-стади считается одним из лучших методик для развития аналитического мышления, критического подхода к решению той или иной поставленной задачи, а также креативности. При этом стоит отметить что кейс-стади доказал свою эффективность при дистанционной форме обучения. Тем самым использование данного метода сможет принести пользу при использовании его на практических занятиях для студентов медицинских и иных ВУЗов.

Ключевые слова. Метод "case-study", учебная клиническая игра, малые группы, оценочные кейсы по микробиологии.

МИКРОБИОЛОГИЯ ФАНИДАН АМАЛИЙ МАШҒУЛОТЛАРНИ CASE-STUDY УСУЛИ АСОСИДА РИВОЖЛАНТИРИШ

Назаров Жалолитдин-Султон Эркинович, Шарипова Мадинабону Акрамовна

Абу Али ибн Сино номидаги Бухоро давлат тиббиёт институти

✓ Резюме

Case-study бу аввало ўқувчининг кейинги ҳақиқий касбий фаолиятида учраши мумкин бўлган муайян амалий вазиятларни таҳлил қилиш ва ҳал этишга асосланган ўқув тизимидир.

Case-study рус тилига таржима қилишнинг аниқ аналогига эга эмас. Ушбу атаманинг тез-тез ишлатиладиган таржимаси, айниқса, тиббиёт олий ўқув юртлари билан боғлиқ вазиятли вазифалардир.

Амалий мисоллар (вазиятлар) асосида ўқитиш қадимдан мавжуд бўлган, масалан, қадимги Спартада ўғил болаларда ҳарбий раҳбарлик кўникмаларини тарбиялаш учун ўзига хос жанрларнинг тавсифи ва уларнинг таҳлилидан фойдаланилган.

Шунга қарамай, расман ўқитиш усули сифатида 1924-йилда Гарвард бизнес мактабида case-study олиб борилди. У ерда унинг ўқитувчи ва ўқувчилари мавжуд дарсликлар ёрдамида реал ҳаётда менежмент ва бизнес юритиш амалиётини ўргана олмасликлари билан тўқнаш келган. Етакчи бизнес амалиётчилари билан суҳбатлар дарсликларнинг ўрнини босадиган бўлди. Ушбу интервьюлар асосида етакчи бизнес-менежерлар томонидан муайян амалий ишларни ҳал этиш бўйича батафсил ҳисоботлар (вазиятлар тавсифлари) яратилди. Бу case-study ўрганиш усули биринчи бўлиб тугилди.

Айни пайтда case-study таҳлилий фикрлашни, муайян вазифани ҳал этишга танқидий ёндашишни ҳамда изодкорликни ривожлантиришнинг энг яхши усулларида бири саналади. Шу билан бирга, шуни таъкидлаш жоизки, case-study масофавий таълим шаклида ўз самарадорлигини исботлади. Шундай қилиб, бу усулдан фойдаланиш тиббиёт ва бошқа олий ўқув юртлари талабалари учун амалий машғулотларда фойдаланилганда фойдали бўлиши мумкин.

Калит сўзлар. "Case-study" усули, ўқув клиник ўйин, кичик гуруҳлар, микробиология баҳолаш ҳолатлар (кейслар).

Introduction

The experience of using the case study method in the practice of teaching students of medical higher educational institutions has shown its high efficiency, especially for the development of skills in structuring information and identifying problems.

In the course of the conducted studies of teaching by the case study method for students of the Bukhara State Medical Institute, the following results were obtained. It was found that interactive teaching methods, in contrast to traditional ones, generally more effectively influence the process of assimilating a complex of clinical knowledge. In addition, they were

clearly distinguished by the individual nature of the impact on the formation of generally known levels of knowledge. So, if traditional teaching methods influenced the development of mainly initial I (knowledge - acquaintance) and II (knowledge - copy) levels, then interactive methods of teaching to more advanced III (knowledge - skill) and IV (knowledge - creativity) their forms.

It should be emphasized that the successful implementation of the educational clinical game "case study" requires a fairly large amount of knowledge in fundamental medical disciplines, as well as mastery of a wide range of

manipulations. This was due to the condition of collecting subjective and objective information, which is the closest to the real clinical setting. It should be noted that the educational clinical game "case study" aroused increased interest of all participants. The knowledge obtained with the help of this type of educational game was much perfect and corresponded to level III (knowledge - skill), and even IV (knowledge - transformation) to its level. More than half of the participants in the game clearly developed elements of III (knowledge-skill), and the rest of the IV level (knowledge-creativity) knowledge. At the same time, the bank of clinical knowledge was enriched much faster, which is an important and distinctive advantage of this method of teaching [2].

As the American mathematician and popularizer of science Diyord Poya said, "The best way to learn something is to discover it yourself."

Therefore, it is necessary not to forget that the best form of education is when the student independently and actively participates in the educational process. The analysis of situations acts as a different way of thinking of the teacher, his special paradigm, which allows him to think and act in a different way. Thus, the teacher renews his creative potential [5].

Working with a case (situational task) has its own specifics and involves a variety of technological approaches. The specific method of creating a problem situation and the organization of independent work depend on a number of factors: the degree of complexity of the educational material, the available time, the characteristics of a particular contingent of students, etc. methodology as a particular example of the organization of classes.

Case development stages

Preparing the case by the teacher. The work on creating a case and questions for its analysis is creative. It is carried out outside the classroom and includes research, methodological and constructive activities of the teacher. It is possible to take a specific situation from real life (medical history, complex clinical case, production task)

- Determination of the place of the case in the system of taxonomy of the objectives of the lesson
- Search for an institutional system that will be directly related to the topic of the case
- Building, or choosing a model of the situation
- Create a description

- Gathering additional information (if necessary)

- Preparation of the final text

- Case presentation, discussion organization

You can use the following training options. The situation is prepared in advance by the teacher himself, then that part of it, which is an incident, is read out, and then after the completion of the process of asking questions by the students, each subgroup makes its own decision, and only then its aspects are discussed in an open discussion.

Work on a case as a situational text begins with the isolation of individual content elements, the search for the essence of the problem, contradictions, their causes and possible negative consequences. Practicing the skills of systemic, correlation, factorial, statistical and other types of analysis allows you to come to your own conclusions and solutions from a problem situation.

When conducting a case-based training session, additional options for student work can be applied. The teacher tells the trainees about the technology of analyzing situations using the "incident" method, then 15-20 minutes is given, and each team works out its own version of the situation (taken from a book, practical activities of enterprises, etc.). When the situations for all teams are developed, then the procedure for collecting information begins: "incident" ("happened ..."); Questions and answers; decision-making; presentation of the solution and its analysis by the authors of the situation. Then another command acts in the same sequence [7].

Forms of organizing a lesson based on the case method:

There are the following possible forms of organizing a lesson based on the case method:

1) each request for additional information is discussed by students, and the issue of its need for an informed decision is resolved;

2) each subgroup of listeners is given all the information they requested, and then, during a general discussion, when discussing the decisions made, it becomes clear which of the information received was used in developing a decision;

3) both qualitative (the significance of information for decision-making) and quantitative measurement (in points, scores) of the requested information are made in comparison with the value of the decision made in the same units. In this case, the method of evaluating information is negotiated in advance,

and the students evaluate decisions collectively. Thus, students learn to collect information in a rational and targeted manner.

The procedure for working with the situation is that the student, having read the description of the problem (case), independently analyzes the situation, diagnoses the problem and presents his/her ideas and solutions in the process of discussion with other students. If the acquaintance with the problem occurs right in the classroom, then usually for an individual analysis it takes from 10 to 30 minutes, depending on the volume of the material. During the analysis of the situation, students learn to act "in a team", to carry out multidimensional analysis and make decisions. As a rule, it takes between 30 minutes and 2 hours of study time to deal with situations. The duration of classes using cases depends on the complexity of the situation and the depth of knowledge of the students [1].

The case method develops the following student skills:

1. Analytical skills.

These include: the ability to distinguish data from information, classify, highlight essential and non-essential information, analyze, present and extract it, find gaps in information and be able to restore them. Think clearly and logically. This is especially important when the information is not of high quality.

2. Practical skills.

The level of complexity of the problem presented in the case, reduced in comparison with the real situation, contributes to the formation in practice of skills in using theory, methods and principles.

3. Creative (divergent) skills.

As a rule, a case cannot be solved by logic alone. Creative skills are very important in generating alternative solutions that cannot be found in a logical way.

4. Communication skills.

Among them are such as: the ability to conduct a discussion, convince others. Use visual material and other media - means, cooperate in groups, defend their own point of view, convince opponents, draw up a short, convincing report.

5. Social skills.

During the discussion of the case, certain social skills are developed: assessing people's behavior, the ability to listen, support in a discussion or argue the opposite opinion, control oneself, etc.

6. Introspection.

Disagreement in discussion promotes awareness and analysis of the opinions of others and one's own. The emerging moral and ethical problems require the formation of social skills for their solution.

Assessment cases are traditionally used in teaching medical students at the stages of midterm and final control. Recently, it has become more and more popular to use cases not only at the stage of student learning, but also when checking learning outcomes in exams. Students receive cases before the exam, they must analyze it and bring the examiner a report with answers to the questions posed in it. You can also offer students a case and right on the exam, but then it should be short and simple enough to meet the limited time frame.

Example of an assessment case (general microbiology)

A patient with a diagnosis of Staphylococcal pneumonia was admitted to the clinic. For successful etiological treatment in order to select an effective antibiotic, it was recommended to determine the antibioticogram of the pathogen.

1. What method can be used to determine antibiotic sensitivity?

2. The principle of the method and the accounting of results.

Answer

1. Method of indicator discs.

2. Paper disks impregnated with antibiotics are placed on the surface of the MPA in Petri dishes, previously inoculated with the "lawn" of the studied bacterial culture. The inoculations are incubated for 18-24 hours, after which the results of the experiment on the formation of light zones of inhibition of bacterial growth are taken into account. The diameter of these zones is roughly judged on the sensitivity of bacteria to antibiotics (Fig. No.1).



Fig. 1. Determination of antibiotic susceptibility of bacteria by the paper disk method

Example of an assessment case (private microbiology)

In the material obtained from the patient, gram-positive, located at an angle to each other, rod-shaped bacteria with thickened ends were found.

1. What pathogenic microorganisms is characterized by such morphology?

2. What additional staining methods can be offered to clarify the morphological characteristics of the pathogen?

3. Is further research necessary?

Answer

1. The causative agent of diphtheria *C. diphtheria* (Fig. 2).

2. Additional staining methods: according to Neisser and Leffler's blue.

3. To clarify the diagnosis, it is necessary to isolate a pure culture and carry out the final identification by cultural, biochemical, antigenic properties and toxigenicity.



Fig. 2. *Corynebacterium diphtheriae*. Methylene blue staining

The main methodological innovations today are associated with the use of new teaching methods. The purpose of the new pedagogical methods is to create a comfortable learning environment in which the student feels confident, which makes the learning process productive and successful [3].

It is customary to divide interactive forms of education into imitative and non-imitative ones.

Simulation methods, which include educational clinical games, immerse students in an atmosphere that is extremely close to the practical work of a doctor. Moreover, it forms and maintains the emotional intensity of the participants and increases the sense of responsibility for the patient's fate, at least at its intellectual level. Educational clinical games make it possible to systematically control the

quality of the growth of professional training of students, and play the role of a barrier on their way to the patient's bed, allowing only the prepared part of them to go to the patients [6].

The use of educational clinical games in the learning process significantly develops the knowledge base with a simultaneous increase in the cognitive ability of students. It gives them creative independence, expands and strengthens the circle of acquired practical knowledge. Students, in these educational games, have the opportunity to show initiative, to feel independence in mastering theoretical positions and mastering practical skills. The main thing is that they naturally perceive the presented educational material. Ultimately, all this contributes to the assimilation of new theoretical and practical knowledge, improves the quality of training of future general practitioners [4].

In the holy book of King Solomon, there are words that explain the benefits of cooperation and mutual assistance: "Two are better than one, for their hard work is worthily rewarded. If one falls, the other will help him up ... Two will defeat the one with whom none of them can cope alone. " The main idea of the case-study methodology is to create conditions for active joint activity of students in various educational and practical situations. At the same time, the methods of work are joint activity, search for an answer (solution of a practical problem), a teacher and students. All this contributes to the development of effective communications in the process of collective search and substantiation of the solution of practical problems. Thus, it will give its results in the training of creatively thinking specialists who will be in demand in the future, due to their preparedness, for a quick and high-quality solution of the problems they will have to face in their professional practice.

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