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M Murugan

Department of Organon of
Medicine, Sarada Krishna
Homoeopathic Medical College
(Affiliated to The Tamil Nadu
Dr. M.G.R. Medical University,
Chennai), Kulasekharam,
Kanniyakumari District, Tamil
Nadu, India

Nivedha KS

Department of Organon of
Medicine, Sarada Krishna
Homoeopathic Medical College
(Affiliated to The Tamil Nadu
Dr. M.G.R. Medical University,
Chennai), Kulasekharam,
Kanniyakumari District, Tamil
Nadu, India

Corresponding Author:

M Murugan

Department of Organon of
Medicine, Sarada Krishna
Homoeopathic Medical College
(Affiliated to The Tamil Nadu
Dr. M.G.R. Medical University,
Chennai), Kulasekharam,
Kanniyakumari District, Tamil
Nadu, India

Understanding the concept of a case using problem-solving approach for undergraduate students

M Murugan and Nivedha KS

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Abstract

Problem-solving skills is the “capacity to engage in cognitive processing to understand and resolve problem situations where a method of solution is not immediately obvious.” These skills, along with a wider range of cognitive abilities like critical thinking, creativity, and scientific attitudes, are thought to be essential for addressing difficulties. Here 88 students of under graduation was selected for the study and given different cases from the OPD as problems to be solved. The answers were then discussed and analysed among the students. Problem solving help in increasing the critical thinking and metacognition of the undergraduate students.

Keywords: Critical thinking, education, meta cognition, problem solving

Introduction

Education for Sustainable Development (ESD) is one of the educational ideas that the Organization for Economic Co-operation and Development (OECD) and the United Nations Educational, Scientific, and Cultural Organization (UNESCO) recommend be taught in scientific classrooms in the twenty-first century. UNESCO encourages a few learning methods and techniques to apply education for sustainable development, specifically: hands-on learning, inquiry-based learning, project-based learning, storytelling, values education, suitable evaluation, fixing problems in the future, learning outside of the classroom, and solving problems in the community ^[1]. Problem-solving is the cognitive process by which a learner recognizes a difference between the current condition and a desired objective and then changes the current situation to the goal state. The Organization for Economic Cooperation and Development defines problem-solving skills as the “capacity to engage in cognitive processing to understand and resolve problem situations where a method of solution is not immediately obvious.” These skills, along with a wider range of cognitive abilities like critical thinking, creativity, and scientific attitudes, are thought to be essential for addressing difficulties ^[2]. In science, it's crucial to have integrated skills including parameter definition, hypothesis development, graphic interpretation, and innovation creation. When it comes to problem-solving, students benefit from the attitudes that scientific methods produce. Furthermore, the findings demonstrate that problem-solving abilities help in improving scientific operation capabilities of the faculty ^[3].

The educators argue that the primary goal of science education is to understand the scientific method. Programs for education have reflected the adoption of this notion. Problems in science classes are typically divided into two categories: concept-based problems and algorithm-based problems. The goal of concept-based tasks is primarily to determine how students define and understand particular concepts. *Because of this, concept-based tasks necessitate more thought and comprehension than mathematical questions.* It's critical that teachers push students to employ more sophisticated thinking techniques and mentally organized information rather than just memorization of facts ^[4].

Case-based and problem-based learning are instructional strategies that connect course concepts to actual situations and issues that students actively participate in by investigating, challenging, and applying science topic knowledge. Although the objectives are the same for everybody, the methods differ just a little. In problem-based learning, student groups follow a predetermined process to determine what they already know and what they need to know. They then figure out how to access any additional information needed to solve a complex biological problem, like figuring out how genes are passed down through generations or creating an experiment to separate out competing theories ^[5].

Students' activities are low in formulating, expressing opinions, and discussing which three of them are part of indicators of oral activity of students, so that in that aspect researchers believe is important to improve the thinking and problem-solving approach. Using problem-solving learning models, students learn by doing more than just listening to the explanations of the content presented by the instructor, but also participate. When thinking, pupils are encouraged to consider issues and discover the answer or solutions to the given problem. The process of problem-solving in teaching and learning can teach pupils how to effectively confront and resolve challenges when dealing with issues in the family or in the community, and this approach can encourage pupils' growth in their capacity to consider everything in detail [6].

In addition to regulation of thought processes, metacognition focuses on awareness of many facets of mental labor. More specifically, metacognition comprises beliefs and knowledge about the strategies that can be applied to complete a task, such as when a strategy might be helpful, what skills are needed, how much time is needed to apply the strategy, potential obstacles, potential benefits, and so forth, as well as self-evaluation regarding one's ability, promptness, and habits to adopt such strategies. As per Sternberg's (1986) analysis, problem-solving involves the subsequent metacognitive elements: a) determining the type of problem to be tackled; b) choosing the elements or steps required to solve the problem; c) deciding on the arrangement strategy for the problem-solving components; d) choosing a mental representation for information; e) allocating resources; f) monitoring Metacognition and

problem-solving methods 3 solutions [7].

The objective of this study is to identify the different problems in the clinical aspect and identifying different method for approaching the problems and finding the solution for it. The study also emphasises the importance of deepening the knowledge in the philosophy of Organon of Medicine.

Methodology

Homoeopathy consist of both theory and practical. The subject Organon of medicine, purely homoeopathic a need an integration with practical approach and exposure in clinical case. For students such a scenario maybe created by imposing problem-based learning. Final year students of the institution were asked to solve clinical cases based on their knowledge of Organon of Medicine. The cases were selected from the OPD. Total of 88 students participated in the approach. Students were given 5 minutes for each question and was asked to write down how they would have approached the cases if presented to them in the clinic. The answers were discussed with the participants and evaluated.

Results and Discussion

Problem solving helps in improving the critical thinking or approach of the students. The questions were based on a particular philosophy in the subject (Table 1) The answers were collected from the students and discussed among them making them more confident and wider perspective of each case scenario. This helped them understand the philosophy in the subject with a practical approach.

Table 1: Questions for the problem-based learning

Sl. No.	Questions
1.	Miss. X, 12 years old female child with fever 101o F, Body pain, chilliness. Based on the totality Eupatorium Perfoliatum 1 M/1 dose on 30 sized medicated pills in 10 ml aqua was administered at 8.30 pm. The temperature raised to 102.2o F. Why it is? How to manage?
2.	Mrs. P, 32, years female came with the complaints of raised blood glucose level after the treatment of skin complaints by non-homoeopathic medicine. Why it is? How to manage?
3.	Mr. S, 43 years male, suffering with pain in neck for six months. He was treated with RHUS TOX, SANGUNARIA and BRYONIA, but not at all feels better. A further enquiry discloses that he is a bus conductor, and the route on duty is with ditches and made to shake his whole head more. What is the management for this complaint?
4.	Mrs. S, 22 years female suffering with headache almost daily for 10 years. She is telling that she is suffering with migraine, head ache is more after loss of sleep, or by travelling in bus. What is your approach according to Hahnemann?
5.	Mr. G, 27 years old male, suffering with whitish discolouration in spots all over the body. How you can help for this patient?
6.	Mr. N, 41 years old male suffering with fever for 3 days took paracetamol, and came with fever, body pain, thirst for large quantity of water, < by movement, hyperbilirubinemia and yellow conjunctiva. How you can treat this patient?
7.	Mrs. J, 62 years' lady suffering with abscess in right thigh region, it was suddenly appeared with pain and redness on the affected region. How will you treat this patient? What will you plan for prevent further recurrence?
8.	Mr. N, 22 years male was met with a road accident, and it was diagnosed as Potts's fracture. How will you manage homoeopathically?
9.	Mr. S, 41 years suffered with fever, body pain and cough. It was found the fever is affecting many people including his wife, two children, father and mother. How will you manage this type of cases?
10.	A 27-year-old female patient came with the complaint of abdominal pain for 3 days and was diagnosed as Acute unspecified gastritis. After prescribing Sulphur 0/3, 7 doses for 7 days, patient started showing new symptoms of Sulphur. How will you manage the case homoeopathically?

The discussion was done in different philosophy based on the Homoeopathic subject – Organon of Medicine (Table 2). The objective of this approach was to Identify the different problems and apply different method to different problems (Table 3). The objectives were met with this approach

showcasing the application of Organon in different cases presented in the Clinic.

Evaluation for each problems was done using marking criteria. Each question was given 5 marks each. Evaluation was done (Table 4).

Table 2: Philosophy based concept in different cases (Problems) [8].

Sl. No.	Analysis of the problems and the solution to the problems
1.	Homoeopathic aggravation – The medicine was correct but the dosage was large leading to the exaggeration of the symptoms – Aphorism 157
2.	Drug induced chronic disease – Medicine from other school of medicine should be stopped first –Aphorism 74
3.	Inappropriately named chronic disease – Maintaining cause is present in the case and once it is removed the individual will become alright- Aphorism 77
4.	One sided diseases with physical symptoms only -Diseases having few symptoms, hence less amenable to cure. They only display one or two principal symptoms, which obscure almost all others – Aphorism 172
5.	Local maladies internal in origin - Among the one-sided disease an important place is occupied by the so-called local maladies, by which term is signified those changes and ailments that appear on the external parts of the body. Till now the idea prevalent in the schools was that these parts were alone morbidly affected, and that the rest of the body did not participate in the disease – Aphorism 174
6.	Conjoint maladies-The patient presented with symptoms of the disease along with disease of the affections after taking allopathic medication. The allopathic medication should be stopped first and the totality should be collected and appropriate simillimum should be employed – Aphorism 91
7.	Acute disease of recent in origin- Based on the totality of medicine, first an acute medicine from other class of proved medicine should be employed first- Aphorism 194
8.	Local Maladies external in origin-Injuries should managed initially surgically followed by employment of appropriate homoeopathic medicine for rejuvenation of the vital force-Aphorism 186
9.	Epidemic disease- Based on the totality collected from different individuals, a common totality should be erected and a Genus epidemic should be employed- Aphorism 101
10.	Medicinal Aggravation – Wrong selection of medicine. The medicine should be stopped immediately and antidote.

Table 3: Learning objectives.

Sl. No.	Learning Objectives
1.	Identify different problems in clinical aspect.
2.	Identify methods appropriate for solving the problems.
3.	Application of method to different problem based on Organon Philosophy
4.	Improve the performance of the learners.
5.	Improve the knowledge of the learners.

- One mark was given for the citation for the book
- Two mark was given for the explanation
- Two mark for the aphorism

students had a neutral basis.

The feedback was collected from the learners (Table 5). Feedback was assessed using Likert’s scale. This study shows that 60 percent of the participant was satisfied with the approach, 20 percent was satisfied and the remaining

Table 4: Evaluation of the participants

Sl. No.	Maximum mark	Number of students
1.	100-80	65
2.	79- 50	10
3.	Below 50	13

Table 5: Learners Feedback

Rating Scale	Very satisfied	Satisfied	Neither dissatisfied nor satisfied	Dissatisfied	Very dissatisfied
Participants	55	18	15	0	0

Conclusion

Problem solving approach using clinical cases helps in improving the metacognition and critical thinking of the under-graduation students.

Conflict of Interest

Not available

Financial Support

Not available

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