

Introduction

Student learning centered processes in the classroom are a high-impact teaching practice that promote:

- Group collaboration
- Appreciation of multiple perspectives
- Reflective judgment
- Critical thinking
- Enhanced understanding of a topic

Case study is an inquiry-based technique that follows the scientific method for solving a problem. Students are provided with results based on a scenario and then work backwards using information found through research to find the answer

Action research consist of students in groups addressing issues and solving problems. Students study a question approaching it from many perspectives to reach an optimum solution and consensus agreement

Purpose

- Assess the effectiveness of mini-case study combined with action research as a supplement in teaching topics in Human Physiology
- Promote group activity and collaboration
- Develop critical thinking and judgment
- Assess peer group activity as a learning method

Methods

Period of Study: Fall semester 2013

Cohort of Students: Two day sections and one night section of Human Physiology (68 students). Students were blinded to the study

IRB: Approved by MCC's Investigational Review Board. Strict confidentiality of student information was adhered to

Students in all sections received the same information about a study topic using standard lecture and laboratory methodology

Arm A: Evening section received mini-case study and action research on Homeostasis, Membrane Transport, and Urinary System

Arm B: Day sections received mini-case study and action research on the Scientific Method and Skeletal Muscle Physiology

Methods

Cases were presented in lab (10 min.). Consisted of a scenario that related to one of the topics and one question. Students were placed in groups of 4 and given roles:

- Manager** kept the group focused & maintained civility
- Recorder** who took minutes
- Interpreter** who summarized discussions
- Idea generator** who prompted suggestions

Each group described the significance of the case, how it related to a topic and answered the one question

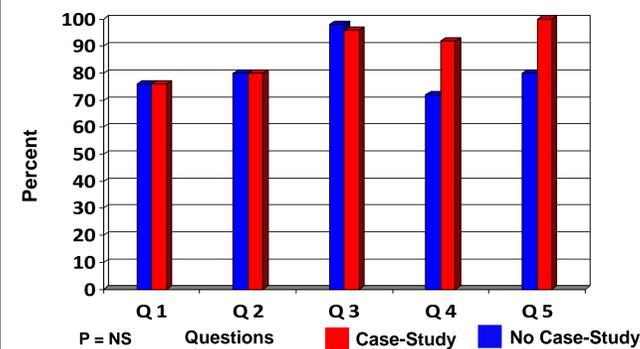
Each student in the group was assigned homework. They were responsible for the development of an additional question related to the case.

- One week for assignment
- Each of 4 questions in a group must be unique
- Student in groups encouraged to contact each other during the week
- Questions developed by a student must be substantiated

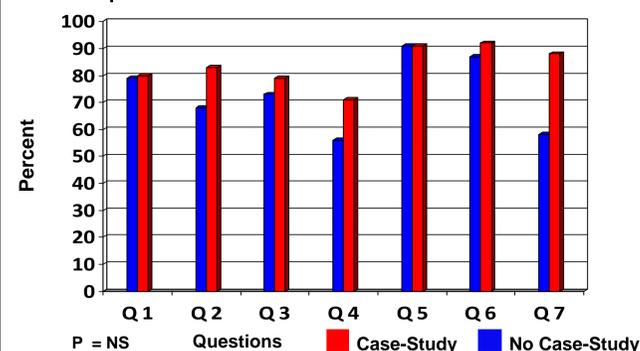
During the following week's lab, groups chose one of the four group questions to present to the class. The class discussed & answered the question (30 min)

Results

Exam I: Comparison of the percent of day and evening students who answering questions pertaining to two topics correctly and did or did not receive case-study/ action research on the topics.

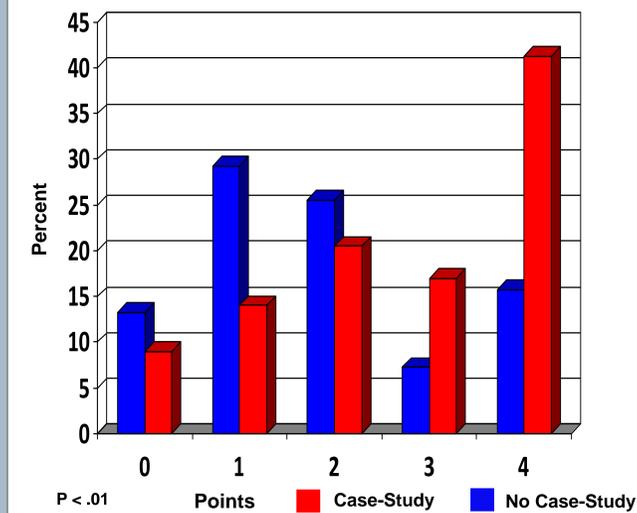


Exam II-IV: Comparison of the percent of day and evening students who answering questions pertaining to three topics correctly and did or did not receive case-study or action research on the topics.

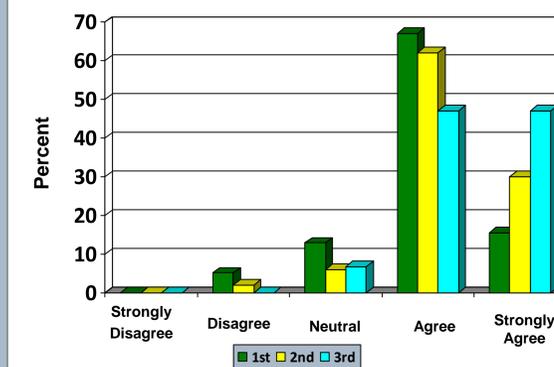


Results

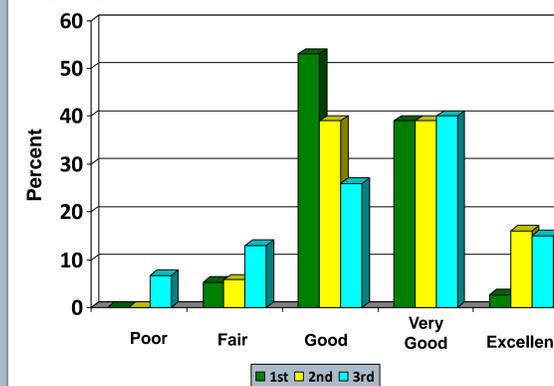
All Exams: A comparison of the average percent students received on each point on questions ranging from 0 to 4 points on five different exams. Students either received or did not receive case-study/action research on the questions pertaining to topics.



Comparison of the assessments completed by all students after the 1st, 2nd, & 3rd exercise of the effectiveness of case study and action research as a method of teaching.



A comparison of student self-assessment of their skills in the case study/ action research process after the 1st, 2nd & 3rd exercise



Students stated that mini-case/action research:

- 1) Reinforced education & knowledge of a topic
- 2) Provided a practical application of topic
- 3) Promoted group interaction
- 4) Taught research skills
- 5) Pushed critical thinking skills
- 6) Taught appreciation of different perspectives

Assignments were assessed using a critical thinking rubric. A grade of 1 to 6 was given based on the level of proficiency in a category. The levels were Emerging (1-2), Developing (3-4) and Mastering (5-6). There were six critical thinking categories:

- 1) Summarized problem, question of issue
- 2) Expressed their own perspective
- 3) Analyses of supporting data and evidence
- 4) Application of other perspectives
- 5) Assess conclusion, implications, & consequences
- 6) Communication

Students improved in each category with experience. By the second or third exercise the average grade was within the developmental level 3-4, a few even higher

Learning Curve

Challenges:

Group dynamics:

- Conflicts
- Hard to get together
- Rely on group members
- Uneven group input
- Easy to get off topic

Suggested Solutions:

- Clear instructions
- Adequate preparation & time
- Group advisement/ adjustment
- On going teaching of research, critical thinking & finding appropriate sources

Knowledge base deficits:

- Lack of Research Skills
- Difficulty thinking critically
- Unsure if going in right direction
- Hard time applying Information
- Difficulty determining accurate sources

Number of Trials

Conclusion

- Students in sections who performed mini-case/action research exercises had higher grades/scores on questions than those who did not receive this method of teaching. Some grades/ scores were significantly different
- Students felt the mini-case/action research method of teaching was effective. It encouraged critical thinking, reinforced understanding of a topic and provided a practical application to the information
- Group interaction allowed students to collaborate, gain and learn from different perspectives
- Students improved on their approach to this process after each exercise/assignment

Author

James Cronmiller

Monroe, Community College, Rochester, New York 14624

E-Mail Address: jcronmiller@monroecc.edu