TEACHING STRATEGY WITH RATIONALE AND CITATION (S)

Target group class:
One Anatomy and Physiology Lecture (BSC 2086) that is a section for students who are majors in science was selected for these activates.

Lecture topic:
The Blood Vessels and Circulation. Unit 4 Fluids and Transport

Teaching strategy:
The goals for selecting this teaching strategy were:
1. To survey the students background knowledge about The Blood Vessels and Circulation. Unit 4 Fluids and Transport
2. To make the students aware that working together in groups will produce better results.

Selection of teaching strategy:
Based on the previous goals I selected to implement a student based technique that is collaborative learning in the lecture (the cell group).

Groups are efficient way to link individual student effort, allowing them to assist and to support to each other. My major concern was how to make the students apply their knowledge based in the class competences / objectives and relate them with the Centers of Disease Control and Prevention.

Heart Disease Facts:
Heart disease is the leading cause of death for both men and women. More than half of the deaths due to heart disease in 2009 were in men (1)
- About 610,000 Americans die from heart disease each year—that’s 1 in every 4 deaths. (1)
- Coronary heart disease is the most common type of heart disease, killing about 365,000 people in 2014. (1)
- In the United States, someone has a heart attack every 42 seconds. Each minute, someone in the United States dies from a heart disease-related event (2)
- Heart disease is the leading cause of death for people of most racial/ethnic groups in the United States, including African Americans, Hispanics, and whites. For Asian Americans or Pacific Islanders and American Indians or Alaska Natives, heart disease is second only to cancer.(2)
- Heart disease costs the United States about $207 billion each year (1). This total includes the cost of health care services, medications, and lost productivity.

Risk Factors:
High blood pressure, High LDL cholesterol, and smoking are key heart disease risk factors for heart disease. About half of Americans (49%) have at least one of these three risk factors (2)
Several other medical conditions and lifestyle choices including:
- Diabetes
- Overweight and obesity
- Poor diet
- Physical inactivity
- Excessive alcohol use.

http://www.cdc.gov/dhdsp/data_statistics/fact_sheets/fs_heart_disease.htm

Resources


Traditional Instructional Aids

Blackboard
Lecture notes, Text book, Power Point Presentations
A Librarian comes to the class to teach the students how to access the Data Base for all Florida Estates College and Universities. The students create an account in order to find scientific information related the HIV.

Technology Driven Aids

Room with technology (projector and computer)
Mastering A&P website provided by the Publisher (Pearson) with movies, tutorials and animations. The students go to mastering/ study area/ select a chapter and find information.
- Study area/ video tutor movie: The Heart
- Interactive Physiology: Cardiovascular System
Anatomy review: The Heart
Intrinsic Conduction System
Cardiac Action Potential
Cardiac Cycle
Cardiac Output
Blood Vessels Structure and Function
Measuring the blood pressure
Factors that affect the blood pressure
Blood Pressure Regulation
Autoregulation and capillary Dynamics

Out of class activities:
The students were asked to read chapter #20 The Heart and chapter #21 Blood Vessels and Circulation in the Fundamentals of Anatomy and Physiology Martini / Nath / Bartolomew, 10th Edition, Pearson, 2015, Chapter 20, The Heart pp. 684-722; chapter #21 Blood Vessels and Circulation pp. 723-780 and to see the interactive Physiology and the video tutor on Mastering. The students have to find additional information at CDC (Centers of disease Control and Prevention) http://www.cdc.gov/

Creation of Groups
The cell group (groups of 2 students) for f2f class activities
Group of 5 students (for Service Learning Action Project) component including a team coordinator.

Procedure:

1- I took the attendance, and explained the class objectives and goals of the lecture: 10 minutes.

Objectives:

Chapter Learning Outcomes

Chapter 20:
20.1- Describe the anatomy of the heart, including vascular supply and pericardium structure, and trace the flow of blood through the heart, identifying the major blood vessels, chambers, and heart valves.
20.2- Explain the events of an action potential in cardiac muscle, indicate the importance of calcium ions to the contractile process, describe the conducting system of the heart, and identify the electrical events associated with a normal electrocardiogram.
20.3- Explain the events of the cardiac cycle, including atrial and ventricular systole and diastole, and relate the heart sounds to specific events in the cycle.
20.4- Define cardiac output, describe the factors that influence heart rate and stroke volume, and explain how adjustments in stroke volume and cardiac output are coordinated at different levels of physical activity.

Chapter 21:
21.1- Distinguish among the types of blood vessels based on their structure and functions, and describe how and where fluid and dissolved materials enter and leave the cardiovascular system.
21.2- Explain the mechanisms that regulate blood flow through vessels, describe the factors that influence blood pressure, and discuss the mechanisms that regulate movement of fluids between capillaries and interstitial spaces.
21.4- Explain the cardiovascular system’s homeostatic response to exercise and hemorrhaging, and identify the principal blood vessels and functional characteristics of special circulation to the brain, heart, and lungs. Discuss the effects of aging on the cardiovascular system, and give examples of interactions between the cardiovascular system and other organ systems.

GSELS related criteria

Students will be able to:

2- Describe the roles of personal and social responsibility in protecting Earth’s abundance and beauty for future generations.
10 - Discuss how access to education, health care and economic prosperity affect global sustainability.
20- Display personal and social responsibility toward achieving global sustainability (service-learning).
Applications

Coronary Artery Disease (CAD):
- Coronary ischemia: Reduced circulatory supply of rich oxygen blood flow to the heart muscle due to partial or complete blockage of coronary arteries. The causes are fatty deposit or atherosclerotic plaque in the wall of the coronary vessel.
- Angina pectoris: is the most common form of temporary ischemia due to the spasm of the smooth muscle in the wall of the coronary vessel.
- Angiography or a high resolution ultrasound are used to see the plaques. The effects of coronary blood flow can be detected by digital subtraction angiography (DSA)
- In Myocardial infarction (Heart attack) the coronary circulation become blocked and the cardiac muscle cells die from lack of oxygen. If the blockage occurs near to the base of a major blood vessel, the patient can die. If the blockage occurs in smaller branches the individual may survive.
- Coronary thrombosis result of a thrombus formation at a plaque.
- Clinical manifestations (pain) and the ECG and blood studies are used do to the diagnostics such as: cardiac troponin t, cardiac troponin I, creatine phosphokinase (CK-MB)
- Treatment of CAD and Myocardial Infarction: about 25% of Myocardial Infarction patients die before obtaining medical assistance. 65% of MI deaths among individuals under age 50 occur within an hour after the initial infarction.
- Prevention of risk factors, drug treatment, non-invasive surgery and coronary artery bypass graft are important part of treatment.

Part 1-Active Learning Activity.
Flipping the class: the students are asked to do a Dynamic Module about the heart and blood vessels and circulation at Mastering before the topic is discussed in class. Mastering assignments are 30% of the class.

Part 2- Interactive teaching-- Peer Instruction.

Before we start the class, we do learning catalytics (10-20 minutes) questions about respiratory system. Learning catalytics is a tool found in Mastering that allows interactive teaching and peer instruction before and during the class time. The students are asked to bring any electronic devise with Wi-Fi capabilities in order to get access to the internet, find and do the questions. The first time, the students answer the questions invaluably and if less than 50% of the class do not answer the questions right, the instructor re launch the question one more time and ask the students to discuss the answer with their peers’ before answering again (Peer Instruction). They were authorized to use their class notes and the lecture book. At the same time while the students collaborate, the professor supervise the students and if additional help is needed, the instructor will go over the difficult topic using the whiteboard and or power point presentation.

Part 3- Service Learning Action Project.

- The Librarian visit the class (20 minutes), teach the students how to access the data base for all state Colleges and Universities in order to teach the students to create an account, navigate the data base and gather for scientific information related to the topic
- The instructor assign topics and distributes accordingly to each team (5 students each including a coordinator).
- The professor select the agency: MDC KENDALL CAMPUS, COMPUTER COURTYARD TUTORING LAB, 11011 SW 104 Street, Room 2100, Miami, FL 33176. CONTACT: Elizabeth Praschnik, Tutoring Lab Coordinator (305) 237-0813 at the Learning Resources. (Learning Resources).
- The students create their project as a team (poster, flayer, presentation), do the hours and educate the community.
- The students are asked to create individually a 5 paragraph essay to reflect about the topic.

**MDC Learning Outcomes:**

1. Communicate effectively using listening, speaking, reading, and writing skills.
2. Use quantitative analytical skills to evaluate and process numerical data.
3. Solve problems using critical and creative thinking and scientific reasoning.
4. Create strategies that can be used to fulfill personal, civic, and social responsibilities.
5. Demonstrate knowledge of ethical thinking and its application to issues in society.
6. Use computer and emerging technologies effectively.
7. Describe how natural systems function and recognize the impact of humans on the environment.

**Part 1-Active Learning Activity.**

Flipping the class: the students are asked to do a Dynamic Module about Heart and blood vessels and circulation at Mastering before the topic is discussed and in class. Mastering assignments are 30% of the class.

Before we start the class, we do learning catalytics questions about their heart and blood vessels and circulation on each chapter. Learning catalytics is a tool found in Mastering that allow interactive teaching and peer instruction before and during the class time. The students are asked to bring any electronic devise with Wi-Fi capabilities in order to get access to the internet, find and do the questions. The first time, the students answer the questions invaluably and if less than 50% of the class do not answer the questions right, the instructor re-launch the question one more time and ask the students to discuss the answer with their peers’ before answering again. They were authorized to use their class notes and the Lecture book.

**SLAP (Service Learning Action Project (10 %) It is mandatory.**

Minimum= 10 hours.

The Agency has to be a non-profit organization and must be listed in the MDC’s Institute for Civic Engagement and Democracy (ICED site)

Agency: Learning Recourses at Miami Dade College Kendall Campus Computer Courtyard.
Contact information: Elizabeth Praschnik; phone: 305-237-2078; office: 2141

**CLASS ACTION PROJECT (copy from the syllabus)**

Student name and last name: ________________________________
Date: _______________
Class time and days: _______________
Community Service-Learning Action:

Identify the recipients of your service:

____________________________________________________________________________________

______________________________________________________

Explain the service/action that is being conducted in the community:

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________________________________________________________

Explain the value of this service/action for the community:

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__________________________________________________________________________________________

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What did you learn from this project that is applicable to the BSC 2085 class?

__________________________________________________________________________________________

__________________________________________________________________________________________

__________________________________________

CAT 3: TEACHER DESIGNED FEEDBACK FORMS

Directions: Please, respond constructively and honestly the questions below. Circle the response you most agree and write a brief comment
(Adapted from Angelo, Cross, 1993)

1- How interested were you in the Service Learning Project?

1-extremely un-interested; 2-somewhat un-interested; 3-somewhat interested; 4-very interested; 5- extremely interested

2- How helpful was the supervisor?

1-extremely un-helpful; 2 somewhat un-helpful; 3-somewhat helpful; 4-very helpful; 5-extremely helpful
3- How useful was the site preparing you for your major?
1- extremely un-helpful; 2-somewhat un-helpful; 3-somewhat helpful; 4-very helpful; 5-extremely helpful

4- How do you grade, overall, the Service learning experience?
1- extremely bad; 2-bad; 3- neutral; 4-good; 5- excellent

SLAP (SERVICE LEARNING ACTION PROJECT)
Recommended areas/topics: The professor will inform you!

Analyze in a Poster/Flyer/presentation/Panel the relation between your service learning project and the objective (s) of this course (BSC 2086 lecture). You can add pictures, graphics, statistics, etc. You have to use your text book, applications manual, and other sources as references.
The students are asked to create individually a 5 paragraph essay to reflect about the topic.

Please, attach a paper for your writing!

Part 2-Professor explains and distributes the survey to students.

Teacher –Designed Feedback Forms to make the students evaluate the effectiveness of different teaching Techniques (lecture, and collaborative learning using lecture and video notes) in order to facilitate the understanding of the Lymphatic System and Immunity

Selection of teaching strategy:

My teaching strategy were mixed of passive and active learning activity
I used the traditional lecture in introducing the material, and combine both passive and active learning.
Lectures convey large amounts of information in a short period of time (I just did a summary in the introduction). It is passive learning style that reduces the anxiety of the students and maximizes the instructor control over the material and procedures. On the other hand the material retention by students is low. Lecture itself application, analysis and synthesis.
The Collaborative learning activity that the students perform during and after the movie playing, brings the opportunity to master the subject mater, brings quality peer interactions, the change for better understanding with divergent points of view, greater class interest and enjoyment, It is very important the increase in motivation to attend the class. In the group the students can speak about their ideas they do not fully understand. The challenge in college is not simply covering the material but uncovering it. In the personal order we have to choose whether to guide the students on the side or to be on the stage.
The learning cell (2 students working together) allows the students work in pairs and help to each other (that means interaction). In this the students have both, the reading assignment in their lecture book and notes and their visual and listening assignment in the movie. I did move during the class session around the room, helping the students in the class activity.
I am flipping all the classes, having web enhance classes on Mastering (Pearson’s product), where I posted assignments. I am doing interactive teaching and peer instruction with learning catalytics allowing the students to use any electronic devise with Wi-Fi capabilities during the class time.
Flexibility is very important since we teach to a multiethnic multicultural population of students and I as a professor want the best results for my students.

Teacher designed feedback form

Directions: Please, respond constructively and honestly the questions below. Circle the response you most agree and write a brief comment.
(Adapted from Angelo, Cross, 1993)

1. How interested were you in today class?
1-extremely uninterested; 2-somewhat uninterested; 3-somewhat interested; 4-very interested; 5-extremely interested

2. How can you rate the clarity of today session?
1-extremely un-clear; 2-somewhat un-clear; 3-somewhat clear; 4-very clear; 5-extremely clear

3. How difficult did you find today class?
1-extremely difficult; 2-somewhat difficult; 3-somewhat easy; 4-very easy; 5-extremely easy

4. How useful was today activity?
1-extremely un-useful; 2-somewhat un-useful; 3-somewhat useful; 4-very useful; 5-extremely useful

Write one or two suggestions for improving this class

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**STEM Service-Learning Course Projects**

**RUBRIC:**

<table>
<thead>
<tr>
<th>Course Number - Course Name Instructor</th>
<th>Description of the S-L Project</th>
<th>Min. hrs. required</th>
<th>Reflection style</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSc 2086 – Human</td>
<td>The project focuses in Heart</td>
<td>10</td>
<td>Essay</td>
</tr>
<tr>
<td>Anatomy and Physiology 2</td>
<td>attack, causes, epidemiology, clinical manifestations, diagnostics methods, complications and treatment focusing on prevention and create tables, flyers, posters and presentations to discuss and educate the community. The students arrange the tables around MDC Kendall Campus and distribute, flayers, respond questions and encourage the community to work on prevention.</td>
<td>10% of the course grade Total points=100 Completion (hours, evaluation)=50pts Reflection (ppt, flayer, essay, poster display board)=25pts Presentation-discussion=25pts</td>
<td>Panel discussion (in class/auditorium) Presentation</td>
</tr>
</tbody>
</table>

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