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Bench to Bedside Action Research Proposal – Draft

Title: Impact of Biomedical Advances Knowledge on High School Students' Career Choices

Abstract

The Purpose of this research action is to investigate a cause-and-effect relationship between the type of information students are exposed to and their choice of career path. The study will use the quantitative approach to measure the impact of biomedical advance research information on high school students' post- secondary goals. Students will be exposed to new advances in medical technology and research in biotechnology. They will receive instructions on new discoveries from stem cell research, to the use of genomic data in treating diseases, and to the use of macromolecular structures and functions. They will also be exposed to different career paths available at different colleges and universities. The quantitative analysis of the results of this experiment will explain how these variables influence the professional directions these students will take after they are graduated from high school.

Rationale

The majority of students attending our schools are from an urban area where the school is located. More than 60% of our student body are on free and reduced lunch. According to last year state test reading assessment, only 33% are reading at gradet level. High performing students at our school are from other school boundaries. They are at our school to attend special academic programs. Over the four years that I have been at that school, a recurrent issue has been happening every time students have to fill out their course selection sheet. When asked about their long term goals or their career path after high school, the answers are usually "I don't know" or "I am not sure". Sometimes, they have a choice that really do not fit their skills.

Choosing a career relies on the individual teenager knowing that she or he has to make a choice (Gati & Saka, 2001). Adolescents should also have the desire to choose and should be able to choose. In their study, Gati and Saga (2001) mentioned the fact that when students are not fully informed about themselves and the possibilities for them out there. This prevents them from making long term career choice. In conclusion, students hesitate to make decisions or make the wrong decisions because of lack of accurate information. The situation is call for action from researchers that would investigate ways to guide students in that matter. An action research would provide me with the opportunity to carry out changes since I have been exposed to a concrete problem (Carson, 1990). I considered that tangible situation as a call for action. This action, in the context of the study will connect global to local and will have an impact on the community (Carson, 1990). As a teacher, I will have the opportunity to reflect on my practice and bring necessary change. Through this project, I will become wiser in my practice. I will gain different types of knowledge such as common sense, skill, contextual, professional and educational (Sanger, 1990).

Action Research Intervention:

This action research will conducted in a population of 100 to 125 students in a class of Biology 1 Honors and regular. Our control group will contain 20-25 students in biology taught by another teacher. The majority are expected to be proficient in reading and in math according to state standards. Based on past experience, the population might include underperforming students, English Language Learners, and students that require special accommodations. The research will be conducted according to quantitative methodology. Data observed and collected will be numerically represented and manipulated (Sukamolson, 2012). This research aims at answering the following questions:

1. How does understanding of biomedical information affects students' potential career choices?
2. How does understanding of biomedical information help rationalize their career choices?

Data will be collected through a survey. The survey will be administered as pre and post-test. This measurement tool will include questions covering content related to biomedical knowledge and a question on career. The question on career choice will require a written justification. The data collected will be analyzed statistically and interpreted. An empirical evaluation will be conducted to determine whether the impact of exposure to biomedical knowledge and career possibilities affect the career decision making of teenagers (Sukamolson, 2012). During the experiment, students will go through a learning experience. They will be exposed to short teacher presentation, science skill activities, lab investigation, reading activities, webquest activities. They will be exploring websites of different colleges and universities involved in biomedical researches or technology. They will look at organizations that are investing in biotechnology or biomedical fields. At the end of the experiment and before they take the post-test, they will have to select a career to investigate and share of the benefits for them. They will have to justify their choice based on personal skills, personal and societal benefits. The choice is open to any field of their choices, in or out of the biomedical field.

Connection to Bench to Bedside Summer Institute:

The following contents from Bench to Bedside Summer Institute will be utilized: Protein synthesis and diseases caused by disturbance in protein synthesis caused by mutations; stem cells and stem cell research; and genomics and drug production. The following teaching approaches

will be put into use: lab activities such pipetting by design, webquest to conduct independent self-pace explorations, reading of scientific journals, data analysis, career explorations. Since, we are limited by several factors, we will be planning an in-county field trip to the Palm Beach State College Biotechnology lab. Lab activities from the Bench to Bedside programs are selected to help students develop a deep understanding of gene and gene expression or non-expression. These experiments will lead students to the exploration of relationships between gene expression and some diseases and individual levels of tolerance to certain drugs.

Literature Cited:

1. Carson, T. (1990). What Kind of Knowing is Critical Action Research? *Theory into Practice*, 29(3), 167-173. DOI:10.1080/00405849009543450
2. Gati, I., & Saka, N. (2001). High School Students' Career-Related Decision-Making Difficulties. *Journal of Counseling & Development*, 79(3), 331-340. DOI:10.1002/j.1556-
3. Sanger, J. (1990). Awakening a Scream of Consciousness: The Critical Group in Action Research. *Theory into Practice*, 174-178. Retrieved from <http://www.jstor.org/stable/1476920>
4. Sukamolson, S. (2012). Fundamentals of Quantitative Research. Retrieved from [http://sites.harvard.edu/fs/docs/icb.topic1463827.files/2007_Sukamolson_Fundamentals %20of%20Quantitative%20Research.pdf](http://sites.harvard.edu/fs/docs/icb.topic1463827.files/2007_Sukamolson_Fundamentals%20of%20Quantitative%20Research.pdf)

Budget and Budget Justification:

Table 1.

Items	Description	Quantity	Sources
lab Kits: Gene switches	Bacteria tuning on and off genes	25 units	UF/CPET Science Locker
Lab Kits: From DNA to protein	Materials will be used to create protein models	25 units	UF/CPET Science Locker

Lab Kits: Enzymes and lactose intolerance	Using enzymes to treat lactose intolerance	25 units	UF/CPET Science Locker
Lab Kits: Genetic Testing for Huntington's disease	Ethical debate on suing animals to test new drugs	25 units	UF/CPET Science Locker
Lab Kits: Genetic Engineering: way to grow	Using genetic engineering to produce human growth hormone	25 units	UF/CPET Science Locker
Other consumables	Include but not limited to: Color paper, construction paper, color pencils, food coloring		

Permission:

I have already spoken to my administrators for permission to implement the action research.

They agree under the condition the experience will not adversely affect students' performance on district and state standardized test.

SINGLE LESSON PLAN**Name: Marie-Romie Alexis****Content Area/Grade:
9-12****Date: October 2015****Unit Name: Scientific Knowledge and Decision Making****Unit Goal**

What unit goal does this daily lesson address?

Standard(s)/Benchmark(s)

What standard(s)/benchmark(s) does this daily lesson address?

SC.912.L.18.4 Describe the structures of proteins and amino acids. Explain the functions of proteins in living organisms. Identify some reactions that amino acids undergo. Relate the structures and functions of enzymes**Students will understand that...**

What should the students understand by the end of today's lesson?

Essential Questions

What essential question(s) does this lesson address?

Connecting Concepts

How will you review yesterday's content and connect today's lesson to it?

Organizing Students for Learning

How will students be organized today for the lessons activities?

Daily Progress Monitoring Assessment		<input type="checkbox"/> Quiz <input type="checkbox"/> Journal <input type="checkbox"/> Exit Ticket (for Content) <input type="checkbox"/> Response Cards		
<p>Based in the results from your Daily Progress Monitoring Assessment, what concepts need to be revisited in the next lesson?</p>				Homework