ASSIGNMENT - SWOT Analysis in the Life Sciences (100 points/10%)

Addresses Course Outcomes 1, 2, 3 and 4:

- Interpret and critically analyze primary scientific literature to assess the validity and reliability of scientific results and evaluate the conclusions drawn from these data
- Demonstrate proficiency in scientific principles, techniques and applications in the life sciences to evaluate experimental design and determine compliance with standards of protocol and ethical practice
- Effectively communicate scientific principles, concepts, methods, and research findings based on critical analysis of primary literature, industry reports, and other life sciences resources
- Pose vital and relevant scientific questions to identify problems, challenges, and opportunities for the development of innovative products and services in the life sciences

SWOT, which represents **S**trengths, **W**eaknesses, **O**pportunities and **T**hreats, is an analysis that is often used during strategic business planning. It can serve as a precursor to any sort of company action, such as exploring new initiatives or identifying possible areas for change. SWOT's primary objective is to help organizations develop a full awareness of all the factors involved making in a decision. Although at first glance the SWOT analysis seems more fitting for a business course, its application in biotechnology is very valuable. Many start-up companies or new products and services in the life sciences are initiated by researchers who recognize challenges and opportunities to investigate complex phenomena and, in the process, make new discoveries, encounter seemingly insurmountable technical problems, or recognize an opportunity to serve other industries. The SWOT analysis enables these researchers to identify both internal influences (strengths and weaknesses) and external influences (opportunities and threats) that will have an impact on their identified opportunity. This process is often based on the observations gleaned from primary scientific literature – the first step in the scientific method.

Recall from last week's critical analysis assignment that assessing the authenticity of the research findings by careful critical analysis serves to broaden the understanding of the subject matter, and ***provide a background for conducting further study.*** This week you will apply your ability to read and critically analyze primary scientific literature to identifying **future research challenges and/or opportunities** for which you will employ a SWOT analysis.

For this assignment, you will read ***primary article B*** which is based on a specific area of biotechnology. You will also read a few resources that will help you think creatively and innovatively before you complete the SWOT analysis. You will then analyze and critique the article for its innovative potential in one of four areas:

1) development of a new research method
2) development of a new research project
3) development of a new product
4) development of a new service

THE ASSIGNMENT

Imagine that you are the CEO of a biotechnology company looking to invest in a new research method, a new research project, a new product, or a new service. You have just read an interesting primary research article (*primary article B,* which will be provided) and you are evaluating its potential for innovation. After reading *primary article B*, as well as the SWOT analysis resources, please address each of the following items.

I. Paper Format (10 points)

A. Title page: Name, Course Name, Instructor Name, Paper Title, Due Date (2.5)
B. Sections of paper numbered and labelled properly (2.5)
C. Type double-spaced, 11-point, Times New Roman font paper with 1-inch margins (2)
D. 3-4 pages (not including title page and reference page) (3)

II. Paper Content (70 points) SWOT Analysis - Label each section of your paper according to the labels A-B below.

A. Introduction (20 points)

1. **Summary (5) - summarize *primary article B*** including the observations, question, hypothesis, experiment, results, and conclusion of the article.
2. ***Eureka*! moment (5)** - In 4-5 sentences, describe a *Eureka!* moment - an aspect of the research (introduction, materials, methods, results, discussion, conclusion) that stood out as you read ***primary article B*** **t**hat you believe could lead to an innovative research method, project, product, or service.
3. **Innovation (5) –** Read all of the required resources and watch the required videos listed below on the topics of *innovation* and *creativity*. Make notes about key take-away messages (you need not submit these notes.) Apply what you have learned from the videos and slides to fully and specifically explain your innovative method, service, product, or research based on the *Eureka!* moment you have identified.
4. **Creativity (5)** - explain the ways in which your innovative method, research, product, or service is creative and can contribute to the biotechnology field.

B. SWOT Analysis (50 points) – Based on your proposed innovative method, research, product, or service, fill in the SWOT Analysis Template provided below and embed it into your paper. Use the provided SWOT Analysis Questions to guide you as you fill in the template.

1. **Strengths (10)** Explain any **internal** resources that would make the innovation possible
2. **Weaknesses (10)** Explain any **internal** factors that could hinder innovation
3. **Opportunities (10)** Explain any **external** factors that could contribute to the success of your innovation
4. **Threats (10)** Explain any **external** threats that could hinder the success of your innovation
5. **SWOT Analysis summary (10)** - Present a similar or related method, research, product, or service to your chosen innovation from at least **two additional** recent primary journal articles. Based on the recent primary literature, what do you regard as the most promising aspect of your proposed innovation and what do you regard as the biggest threat to the future of your proposed innovation? (Be sure to cite the resources)

III. Paper References (15 points) If no references are cited, a grade of zero for this assignment will be awarded.

A. Use at least 10 references (5) All references should be cited throughout the paper: DO NOT USE WIKIPEDIA
B. **In-text** references in **APA format** (5)
C. **End** references in **APA-format** (5)

IV. Paper Grammar (5 points)

Spelling, punctuation, capitalization, sentence construction, and paragraph construction will be considered in the grading of this assignment.

Please submit your paper as a Word document to the appropriate assignment folder. Please label your paper with your first name, last name and SWOT Analysis. For example: Sharon Brown – SWOT Analysis.

Read
primary article B

SWOT ANALYSIS RESOURCES

Innovation in 5 Minutes

http://www.slideshare.net/Brokenbulbs/understand-innovation-in-5-minutes?related=2

Short Practical Steps to Developing an Innovator's DNA (Slide Presentation):
http://www.slideshare.net/sivapriya28/the-innovators-dna?related=2

What is Creativity and Innovation?

http://www.slideshare.net/ingosigge/creativity-innovation-18790832?related=3

Use the resources listed below to help you choose a specific area of interest for the opportunities section of the assignment:

Career Trends

http://www.nhscareers.nhs.uk/explore-by-career/healthcare-science/careers-in-healthcare-science/careers-in-life-sciences/
http://www.nhscareers.nhs.uk/explore-by-who-you-are/undergraduates-and-recent-graduates/
http://www.nature.com/naturejobs/science/articles/10.1038/nj7393-277a

Service Trends

http://www.lifesciencepatents.nl/en/
http://lifesciencesadvisory.com/services
http://www.indeed.com/q-Technology-Transfer-jobs.html
http://www.federallabs.org/employment/

Technology Trends

www.bio.org
http://www.biotech-now.org/
https://www.youtube.com/watch?v=ptqPJGTsIoM Future Technologies That Will Change the World
http://www.marketsandmarkets.com/Market-Reports/life-science-chemical-biotech-instrumentation-market-38.html

http://aami-bit.org/loi/bmit OR https://www.mhealthevidence.org/journal-title/biomedical-instrumentation-technology-association-advancement-medical-instrumentation

http://www.unboundmedicine.com/medline/journal/Biomedical_instrumentation technology
http://www.biotechmedia.com/y2001-ed-bit.html

SWOT ANALYSIS TEMPLATE – FILL IN AND EMBED IN YOUR PAPER

Internal	
Strengths	Weaknesses
1.	1.
External	
Opportunities	Threats
1.	1.