Open Ended, Real-World, Student-Centered Learning Modules for Nutrition and Pharmacy

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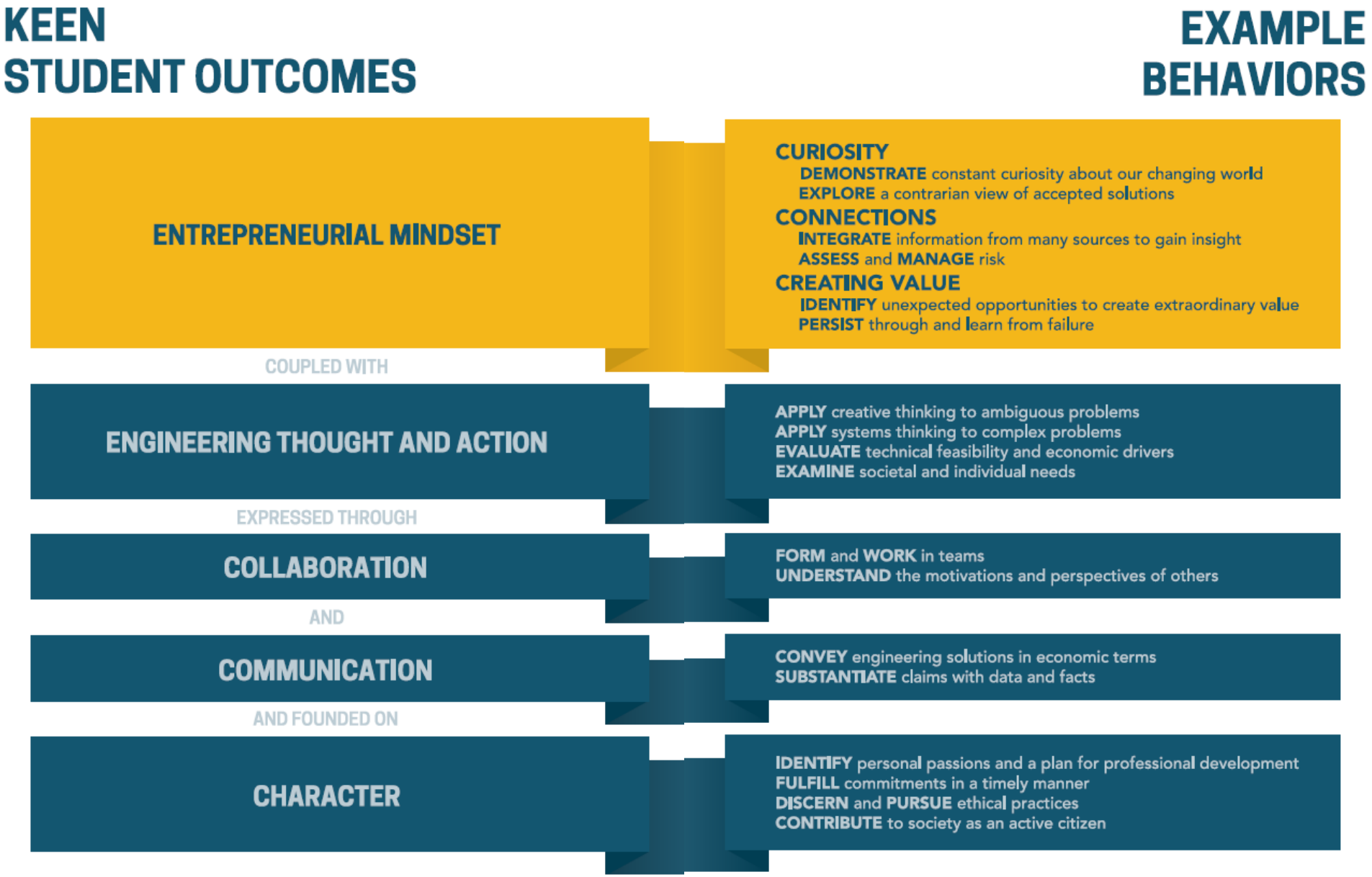
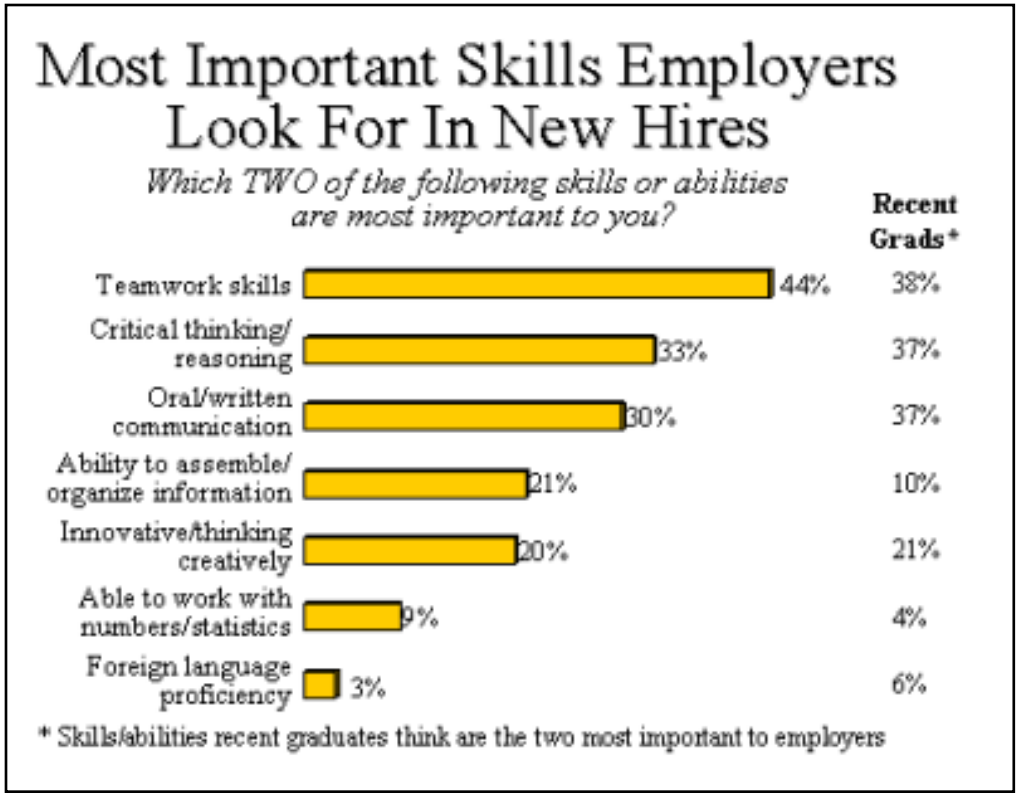
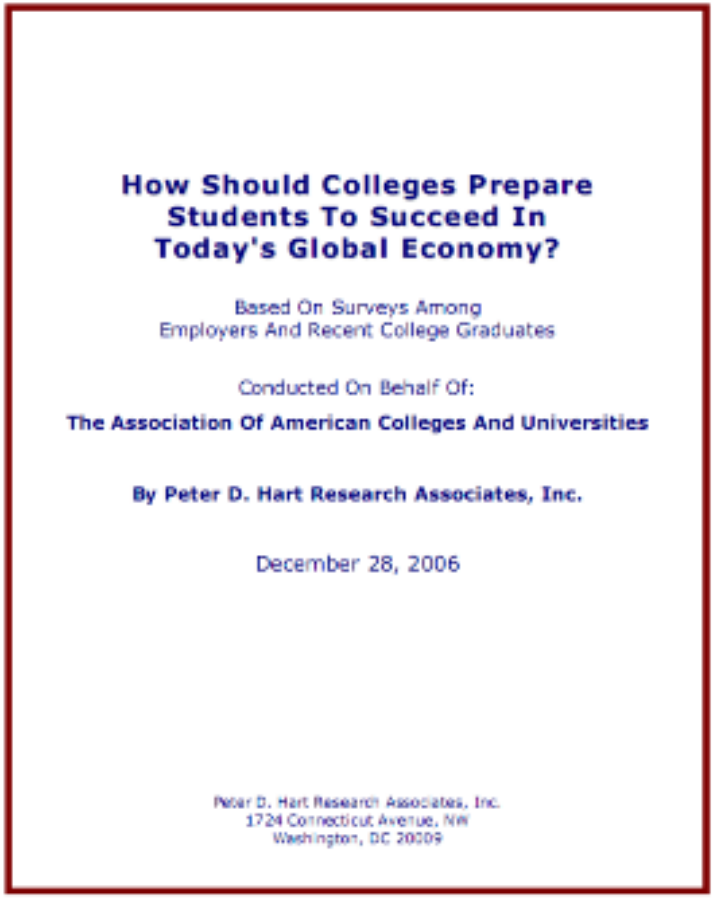
Inspiration: KEEN workshop



Skills that employers seek





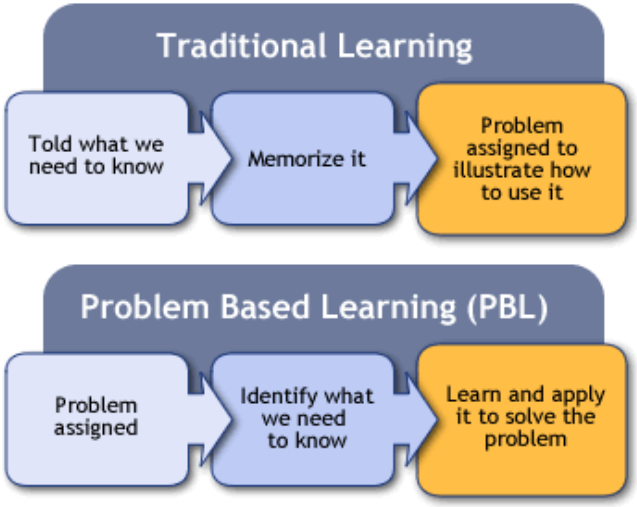
http://www.aacu.org/advocacy/leap/documents/Re8097abcombined.pdf

Cooperative/Collaborative Learning

Instruction that involves people working in teams to accomplish a common goal, under conditions that involve both *positive interdependence* (all members must cooperate to complete the task) and *individual and group accountability* (each member is accountable for the complete final outcome).

Active-Collaborative Learning & Problem Based Learning

- ACL uses informal or formal cooperative learning groups
  - Informal activities include: think, pair, share, muddiest point, minute paper, rank order, immediate feedback readiness technique (IF*AT)
  - Formal activities include: jigsaw, gallery walk, peer composition/editing
- PBL is a type of formal ACL where the starting point for learning is a problem to solve.



Active-Collaborative Learning & Problem Based Learning

- Learning is initiated by a problem, often open-ended using complex, real-world situations
  - *Promotes curiosity*
- All information needed to solve the problem is not given initially (ill-defined)
  - *Requires a tolerance for ambiguity*
- Students identify, find, and use appropriate resources
  - *Students make connections and create value by recognizing opportunities, using creative problem solving, integrating information from many sources to gain insight*
- Students work in groups
  - *Promotes teamwork*
- Learning is active, integrated, cumulative, and connected
- Students report solutions
  - *Requires communication*

Two PBL learning modules

1. Do you need antibiotics?
   - General Biology II (BIO 108) for pre-pharmacy majors
2. WNE: Best Campus Food?
   - Nutrition (HS 290), NSP course and Health science elective

Do You Need Antibiotics?

- Learning Objectives
  - Compare the behavior and structure of viruses and bacteria, examine the mechanism of antibiotic action
  - Develop a method to communicate the differences between viral and bacterial infections and the consequences of inappropriate antibiotic use to patients in pharmacies.
  - Communicate the societal and economic benefits of appropriate antibiotic use
- KEEN Student Outcomes Addressed
  - Demonstrate curiosity (formulating questions)
  - Integrate information from many sources (research)
  - Examine societal needs (investigate patient perception and develop a suitable message)

Do you need antibiotics?

As an intern in the Walgreen's Pharmacy on Wilbraham Road, you retrieve dozens of antibiotic prescriptions per day. You frequently overhear patients talking about how they ask their doctors for antibiotics for their cold and flu symptoms. Your Pharmacy team learns that there have been several recent incidences of Methicillin-Resistant Staphyloccus Aureus (MRSA) in Springfield. What can you do to educate your patients about the appropriate use of antibiotics? Your pharmacy supervisor will give a $500 bonus to the best educational tool that is developed.

Bio 108
Spring 2016

Team Formation Questionnaire

Name:_____

Hometown:_____ H.S. GPA (& year of graduation) _____

Hobbies/Interests: _____

Preferred times for team meetings and group work (please circle as many as possible):

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Morning	Morning	Morning	Morning	Morning	Morning	Morning
Afternoon	Afternoon	Afternoon	Afternoon	Afternoon	Afternoon	Afternoon
Evening	Evening	Evening	Evening	Evening	Evening	Evening

Why did you choose pre-pharmacy or what component of pre-pharmacy interests you?

Describe your experience with microbiology and anatomy & physiology. What courses have you taken in these topics?

Have you ever been a leader/officer in an organization? If so, in what capacity?

Would you be willing to be a team leader in this course?

The information provided here will assist in forming good functioning teams. Please be as generous as possible with preferred times available for group work. If there is a person you wish to have as a group member, please write his/her name below. Please write no more than one name.

Six teams of 5 students were formed using this questionnaire.

Teams were selected based on similar availability, mixed experience with the content, and balanced gender.

Student preference for a particular group member was honored if availability was consistent.

Stage 1: In class

1. Individually, think about some of the main issues regarding antibiotic prescriptions and patient's perceptions of these drugs. Write down these issues and any questions that they raise for you.

2. Within your teams, pair up and share your questions with one another.
3. Share your list with your group, and come to a consensus about the most important issues and questions you need to address in order to educate your patients.

Suggestions for Research

- EDUCATIONAL INFORMATION – what is it that people need to know? Who is your target audience? What do they already know? What misunderstandings might they have?
- IMPACT – what are the societal and economic consequences of not having this information? What kinds of health issues might result? What populations are most vulnerable? Who bears the cost of inappropriate antibiotic use?
- MESSAGING – how and where is this information currently being delivered. Is it effective? What audiences might be missing this information? Is there information missing from the current messaging? Are there types of messaging that have been under-utilized?
- DESIGN – how can you use all of this information to design an educational tool that will convey this message? How can you make this tool visible, appealing, interesting, accurate, and useful?

Stage 2:

- Outside of class, meet with your teams and assemble as many answers as you can to your questions. Pay attention to your sources and note their reliability.
- In one week, come to class with:
  1. A completed progress report form documenting your individual and group research, progress, plans, and questions.
- In two weeks, come to class with:
  2. A technical written report summarizing your research and evaluating the reliability of your sources. This should be written and assembled as a group.
  3. Your complete educational tool. Be ready to present it to the class and discuss how it will be used to effectively educates the public about antibiotic use and misuse
  4. Completed peer- and self- evaluation forms.

Progress Report - Individual

1. Summarize the research that you personally have done so far and your major findings
2. Summarize the major findings and ideas of your group so far
3. Describe your role in this project and how it was decided
4. Evaluate the effectiveness of your group so far. Have you been working well as a team? What have been your major strengths and challenges?
5. Summarize your plans for completing the assignment, and any support or clarification that would be helpful to you and/or your group.

Evaluation

Your work will be evaluated according to the following criteria:

1. Ability to work in a team (20 points, individual)
2. Accuracy and depth of the technical report (16 points, group)
3. Creativity and presentation of educational tool (12 points, group)

Rubric: Teamwork

20 points possible

Teamwork	4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Communication	Communicates freely, listens carefully, considers everyone's opinion.	Usually communicates freely, but sometimes hesitates to offer information	Occasionally communicates openly when asked, not always considerate of other opinions	Rarely communicates voluntarily, may attack or blame, have negative contribution to meetings.
Participation	Routinely provides useful ideas in the group. A definite leader who contributes a lot of effort	Usually provides useful ideas in the group. A strong group member who tries hard.	Sometimes provides useful ideas in the group. A satisfactory group member, does what is required.	Rarely provides useful ideas in the group. May refuse to participate.
Problem-solving	Actively looks for and suggests solutions to problems	Refines solutions suggested by others	Does not suggest or refine solutions, but will try others' suggestions	Does not try to solve problems or help others solve problems.
Organization	Organizes and divides work responsibly and fairly, completes tasks on time.	Defines and organizes own responsibilities, and is usually aware of group needs. Occasionally loses track of time.	Sometimes defines and organizes own responsibilities, doesn't focus on group, often loses track of time	Poorly defines and organizes responsibilities, thinks only about individual tasks, not results or objectives.
Preparation	Always ready for action, well-informed, has good ideas and researches thoroughly	Mostly prepared for meetings, has some ideas and good research	Somewhat prepared for meetings, has some research but more ready to follow	Not prepared for meetings, uninformed, not ready to act

Teamwork evaluation form

How would you rate yourself and your team members in the following categories regarding *this* project? (Circle the appropriate number). See the Teamwork rubric for a description of the evaluation criteria. 4= Excellent, 3 = Good, 2 = Fair, 1= Poor

1. Your Name: _____

Communication	4	3	2	1	Comments:
Participation	4	3	2	1	
Problem-solving	4	3	2	1	
Organization	4	3	2	1	
Preparation	4	3	2	1	

2. Team member's name: _____

Communication	4	3	2	1	Comments:
Participation	4	3	2	1	
Problem-solving	4	3	2	1	
Organization	4	3	2	1	
Preparation	4	3	2	1	

3. Team member's name: _____

Communication	4	3	2	1	Comments:
Participation	4	3	2	1	
Problem-solving	4	3	2	1	
Organization	4	3	2	1	
Preparation	4	3	2	1	

Rubric: Technical Report

16 points possible

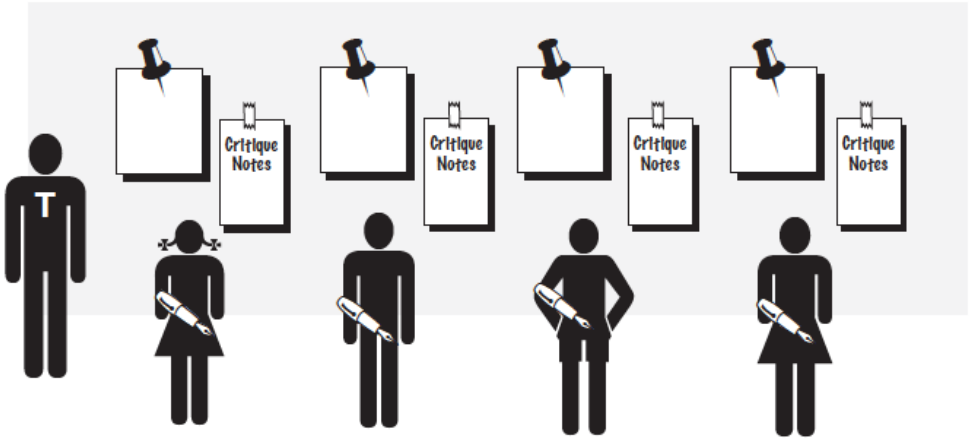
Technical Report	4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Content	Report thoroughly and accurately addresses the differences between viruses and bacteria and the mechanism of antibiotic action. All sources are reliable and are clearly evaluated.	Report discusses bacteria, viruses, and antibiotic action, but is missing some elements or contains some inaccuracies. Most sources are reliable, and they have been evaluated.	Report is missing many key elements of the topic and/or contains substantial inaccuracies. Many sources are unreliable or citations are missing, and the evaluation of sources is superficial.	Report misses the main topics or presents mostly inaccurate information. Most sources are unreliable or absent altogether. Sources were not evaluated.
Analysis of impact and messaging	Report clearly analyzes the societal and economic impacts of improper vs proper antibiotics use. It is evident that the group has thoroughly researched the current messaging and its effectiveness.	Report does a good job analyzing the societal and economic impacts of antibiotic use. The report includes a discussion of current messaging and its effectiveness.	The analysis of societal and economic impacts is superficial and/or incomplete. A discussion of current messaging is superficial and/or incomplete.	Analysis of one or more elements (societal impact, economic impact, and messaging) is absent or largely incomplete.
Organization	Report is organized clearly, easy to read and understand.	Report is mostly organized, a good effort was made.	Report is somewhat organized, but challenging to follow at times.	The report is largely unorganized and challenging to follow.
Spelling and Grammar	There are no spelling or grammar errors.	There are very few spelling or grammar errors.	There are many spelling or grammar errors.	Abundant spelling and grammar errors make the report difficult to understand.

Rubric: Educational Tool

12 points possible

Educational Tool	4 (Excellent)	3 (Good)	2 (Fair)	1 (Poor)
Presentation	Presentation is clear, complete, compelling, and comprises all group members.	Presentation is mostly clear, there is clear evidence of effort and attention, and all group members participate in some way.	Presentation is somewhat confusing, group members are not quite all on the same page, or only select members participate.	Presentation is unorganized, confusing, and uncoordinated. More than one group member does not participate.
Design	Educational tool is unique and interesting, design is appealing and easy to read/watch. The design complements the message.	Educational tool is interesting but not necessarily unique. Design is good but colors, fonts, sound or visuals somewhat obscure the message	Educational tool is similar to other current messaging. Design is ok; colors, fonts, sound or visuals obscure the message	Educational tool is not at all unique, and the design completely obscures the message.
Content	The content of the educational tool is appropriate and relevant for the audience. All information presented is completely accurate.	The content of the tool is mostly appropriate and relevant. Information is not entirely accurate.	The content of the tool is either not appropriate for the audience or mostly irrelevant. There are major inaccuracies present.	The content of the tool is largely irrelevant, inappropriate for the audience, and inaccurate.

Presentations: Gallery Walk



WNE: Best Campus Food?

Western New England University is planning to revitalize the on-campus eating options. The administration is soliciting feedback from students enrolled in Dr. Rocheleau's Nutrition course about students' current eating habits and how well the current options serve the WNE community. They are particularly interested in a detailed nutritional analysis of the current options and proposals for new menus that would promote nutritional health on campus. What can your group do to address these issues?

healthy for LIFE™
NUTRITION HIGHLIGHTS

HS 290-02
Spring 2016

Team Formation Questionnaire

Name:_____ Major: _____

Hometown:_____ GPA (& year of graduation) _____

Hobbies/Interests: _____

Preferred times for team meetings and group work (please circle as many as possible):

Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Saturday**	**Sunday**
Morning	Morning	Morning	Morning	Morning	Morning	Morning
Afternoon	Afternoon	Afternoon	Afternoon	Afternoon	Afternoon	Afternoon
Evening	Evening	Evening	Evening	Evening	Evening	Evening

What aspects of nutrition interest you?

What courses have you taken that relate to biology and/or nutrition?

Have you ever been a leader/officer in an organization? If so, in what capacity?

Would you be willing to be a team leader in this course?

The information provided here will assist in forming good functioning teams. Please be as generous as possible with preferred times available for group work. If there is a person you wish to have as a group member, please write his/her name below. Please write no more than one name.

Five teams of 5 students were formed using this questionnaire.

Teams were selected based on similar availability, mixed experience with the content (majors vs non-majors), and balanced gender.

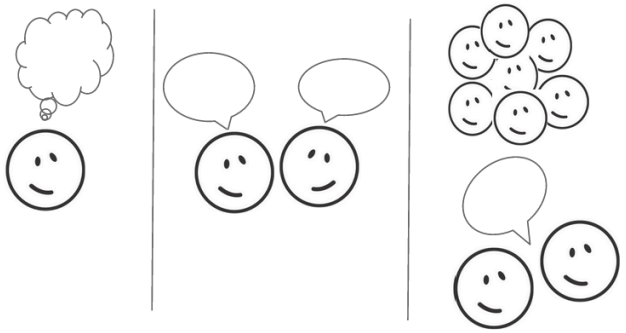
Student preference for a particular group member was honored if availability was consistent.

Stage 1: Current on-campus options

Weeks 2-3

- In class: Rank order
  - Rank the on-campus dining options from healthiest to unhealthiest.

- In class: Think, pair, share
  - What are the most important elements of a dietary analysis? How can you find and analyze nutritional information from each on-campus dining location?



Stage 1: Current on-campus options

Weeks 2-3

- Group homework: (due in 2 class periods)
  - Each team will conduct a dietary analysis of one on-campus dining location
    - Subway, Starbucks/POD, Dining Hall, Rock Food Court, AHLC
  - Suggested Tools: Campus dish app, My fitness pal app, starbucks and subway websites, interviews with food service managers
  - Presentations in Gallery walk format, follow up with in-class discussion

myfitnesspal
Calorie Counter & Diet Tracker

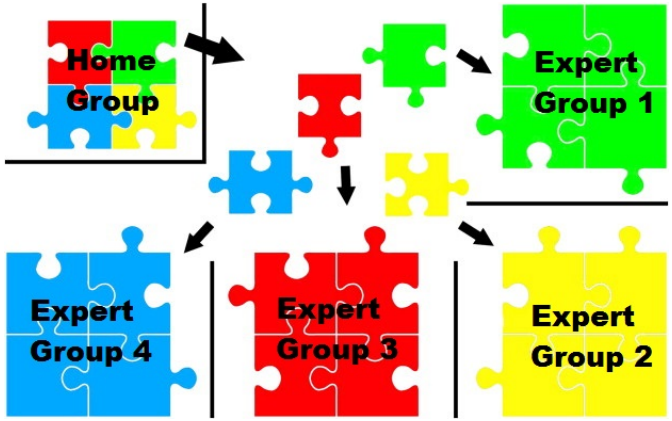
Stage 2: Macronutrient Comparison

Weeks 5-6

- Jigsaw (in and out of class)

  Expert groups will examine the availability of foods from each dining location with

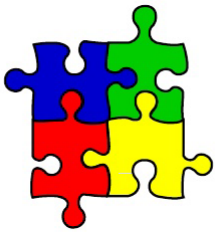
  1. High and low fiber content
  2. High and low sugar content
  3. Oils with high and low P/S ratios
  4. Meats with high and low grams of fat per serving
  5. Plant sources of protein and complementary protein for vegetarians



Stage 2: Macronutrient Comparison

Weeks 5-6

- Jigsaw part 2
  - Home groups will share information about macronutrients from each expert and add to their analyses of dining location nutrition from Stage 1.
  - Each group will hand in a revised and updated dietary analysis for their location.



to their **HOME** groups…

Stage 3: Design a weight control diet

Week 8

- Use the current on-campus options you've been investigating to design a weight control diet. Examine the feasibility of following this diet.

Stage 4: Micronutrient Comparison

Weeks 9-11

- Compare vitamin content
- Examine high and low sodium foods
- Compare antioxidant content
- Identify foods with adequate iron
- Identify foods with adequate vitamin D

Stage 5: Student Cohorts

Weeks 12-14

- Analyze the eating habits and nutritional needs of a particular WNE cohort. Are the current campus options serving the needs of this cohort?
  - Athletes
  - Students with eating disorders
  - Vegetarians
  - First year students on meal plan
  - Faculty and staff
  - Other?

Stage 6: New Menu Design & proposal

Week 15

- Design a menu for a new eating venue on campus. Write a proposal describing the need for this eating venue given the research you have done in stages 1-5. How will your eating venue better serve the WNE population?