NUTR 241 Nutrition through the Life Cycle
Course Learning Impact Report (2006-2007): Part I
Written by Cynthia Baranoski (Course Instructor) & Catherine Arnold (DPD Director), July 23, 2007

Description:

Course description: NUTR C241 (3) Nutrition through the Life Cycle. A life cycle approach to nutrition science; incorporates nutrient availability, function and sources; energy balance; health risk factors; and special nutrient needs for various stages of the life cycle. Each semester.

NUTR 241 Nutrition through the Life Cycle is a critical course in the program for numerous reasons. It is generally the first course the nutrition major takes as part of the program since it is the listed pre-requisite for many other nutrition courses making it a truly foundational course. It is designed to increase a student's knowledge and skills, providing an early introduction to nutrition assessment and basic problem solving using case studies. A "new" instructor was hired to teach the course this year; she incorporating an increased level of technology into the delivery method. It is a key point of entry into the major, thus we wanted to evaluate the student response to the teaching materials, methods, and level of engagement about nutrition.

To evaluate the impact of the course on student learning, multiple sources of information were examined:

- The IDEA Survey Evaluation tool provided student feedback about progress on objectives and overall effectiveness of the course (fall 2006).
- Instructor feedback about course improvements (spring 2007).
- An instructor developed evaluation tool (Appendices A and B) to examine course materials, delivery method, and engagement - administered as a post-test (spring and summer 2007).

Results:

IDEA Survey Course Results on Progress on Objectives:

Twenty-two of 32 (59%) students completed the IDEA survey course evaluation (www.idea.ksu.edu) in fall 2006, making it "probably representative." This tool provided comparative information by contrasting the results with the disciplinary average and the institution average. There is research to support the validity of this tool correlating student ratings with (moderate level correlation) administrator ratings, colleague ratings, and alumni ratings. (Refer to Table 1 – Note: one set of comparison ratings was unavailable due to improper coding of the Faculty Form by an assistant.)

Students in NUTR 241 **reported they acquired, understood, and applied discipline specific knowledge**, thus meeting both program and university objectives. The raw scores of $\geq$ 4.0/5.0 meet our department benchmark. The mean raw scores for each objective are similar to those in all three comparison groups: those in the IDEA database, discipline database, and institution. (Refer to Table 1)

Table 1: IDEA Progress on Objectives and Comparative Results for NUTR 241 (fall 2006)

	Course Score (5 point Scale)		Comparison Group Average			IDEA Database Converted Average		Discipline (IDEA data) Converted Average		Institution Converted Average	
Progress of relevant objectives:	**Raw**	**Adj**	**IDEA**	**Discipline**	**Institution**	**Raw**	**Adj**	**Raw**	**Adj**	**Raw**	**Adj**
Gaining factual knowledge (terminology, classifications, methods, trends)	4.0	3.9	4.0	4.1	4.2	51 Similar	48 Similar	48 Similar	47 Similar	47 Similar	47 Similar
Learning fundamental principles, generalizations, or theories	4.1		3.9	4.1	4.2						
Learning to apply course material (to improve thinking, problem solving, and decisions)	4.0	3.8	4.0	4.1	4.2	50 Similar	46 Similar	47 Similar	46 Similar	47 Similar	47 Similar

Much higher = Highest 10% of classes (63 or higher)
Higher = Next 20% of classes (56-62)
Similar = Middle 40% (45-55)
Lower = Next 20% (38-44)
Much lower = Lowest 10% (37 or lower)

The **overall rating for course was 4.4/5.0 (**raw) and 4.1/5.0 (adjusted), placing the raw score in the *"higher" 30%* of courses rating range. The instructor rating was 4.3/5.0 (raw) and 4.1/5.0 (adjusted), both of which were "similar" to the comparable groups. These ratings are important to consider as this was the first semester this instructor was teaching a university level course. Using a previous syllabus and some assignment guidance from the department chairperson, the instructor developed the course content "from scratch."

The five highest ratings given by students for course attributes included: related course material to real life situations (4.5/5.0), involved students in hands-on projects (4.5/5.0), provided timely and frequent feedback (4.4/5.0), gave test, projects, etc. that covered the most important points (4.3/5.0), and displayed a personal interest in students and their learning (4.2/5.0). The lowest rating was for the attribute: formed teams or discussion groups to facilitate learning (2.8/5.0). This was likely because "teams" was not a method of learning utilized in this course, although discussion was.

Instructor Feedback:

Towards the end of the spring 2007 semester, instructors who taught the same course at least twice were asked to report on any course improvements made during that academic year, and explain how s/he knew it was an improvement (i.e., provide data).

In response to the question, the following improvements were listed by the instructor as initiated during 2006-2007:

1. Big change was a new instructor after ten years of previous instructor!
    - Good evaluations (IDEA survey evaluation tool – results meet or exceed department benchmark) by students in fall 2006.
2. Maintain primary lecture mode, but move from use of overheads (former instructor) to 100% PowerPoint. Created over 600 slides for course. Perceived advantages: more visually appealing, organized, succinct, easy to update, can link to the Internet, professional in appearance, and can include pictures, graphs, graphics where needed. Instructor can engage the class better because she does not need to be turned around writing on the board, it is clearer for students notes, and can print out slides as needed for handouts.
    - Need to determine success (see next section)

3. Activities designed for active learning, discussions, and new handouts. Current information was used. These complemented lecture, especially portions not found in text book. Were easily referenced during discussion. New inclusions:
    a. Activities: pair up and 24 hour food recall at beginning of class with brief analysis; EER activity, formula taste testing, placing a saltine on tongue for CHO digestion, positioning to swallow; MyPyramid,;Exchanges; Wordfind; Billy Bolus; and Growth Charts
    b. Video with discussion: newly added (swallow studies, endoscopies) to enhance GI section; plus use of videos about eating for infants, toddlers, elderly, and those with eating disorders
    c. Enhanced topic discussion: special needs nutrition, Gerber Start Healthy Feeding Plan, tube feedings/enteral nutrition with examples of equipment, SOS Approach to Feeding 32 steps to eating, sugar and fat replacements, food label slides step by step discussion adapted from the government, health/structure/function claims on labels, food safety from FightBac - government information
    d. New handouts:
        i. Organizational guide for each section 1-9
        ii. Exchange List – adapted, sited
        iii. MyPyramid activity – made, graphic sited
        iv. American Heart Association Wordfind - made
        v. Distribution of Macronutrients - made
        vi. Billy Bolus – Dr. Arnold
        vii. Digestion slides - made
        viii. Determining Energy Requirements - made
        ix. Assessment slides - made
        x. Use and Interpretation of CDC Growth Charts - made
        xi. Nutrition Focus Pediatric Formula – approval obtained, ongoing
        xii. Nutrition Facts Label – government download
        xiii. Food Talk newsletter - DuPage Department of Health – approval obtained
        xiv. Foodborne Illness – Ten Least Wanted Foodborne Pathogens – government download
        xv. Food Safety – FightBac – compiled from government site
        xvi. Important Vitamins and Minerals in Pregnancy - made
        xvii. Exchange examples – Updated from previous instructor version, expanded
        xviii. Malnutrition signs – textbook graphic
    - Need to determine success (see next section)
4. Professional competency examples shared: growth chart plotting, final written evaluation report and intake paperwork at Easter Seal Department to assist with tool to use for case studies, how to plot pregnancy growth chart, soon to have insulin pump equipment to share, numerous diagrams and graphics.
5. Electronic grading: learned to use Excel to record and calculate grades.
    - Result: less time consuming, professional, and easily modified (instructor report). Greater efficiency means return of grades faster to students.
6. Policy of fast feedback on submissions to promote learning:
    a. Return and review of case studies at no more than 1-2 classes after completion.

b. Return and review of exams at next class.
c. Immediate response to students email questions – encouraged to email with questions or concerns.

- Need to determine success (see next section)

7. Expanded reviews prior to each exam:
    a. Time spent in class verbally quizzing students to prepare for exam. First semester 99% of students showed up on an off night for final exam review. Request for review by students.
    b. 100% class participation in reviews.
    - Need to determine success (see next section)
8. Assignments: Continuation of three take home case studies, and one in class, with updated questions and exercises for all. Incorporation of rubric (new) for class participation in syllabus.
9. Fall 2006 three of four exams 100% new, one exam significantly changed. Spring 2007 three of four exams changed for content, then changed for layout to prevent cheating – two versions distributed for exam. Final exam created Fall 2006 brand new, Spring 2007 updated as needed, modified for layout, and two different versions created to avert cheating.
10. Offering class in summer 2007 (first time in over ten years due to increase demand).
    - Need to assess perceived value (see next section)

Based on reflections from spring 2006 course, the follow-up plan to the list of learning resource improvements was:

1. Conduct the 2007 Student Surveys (Refer to Appendices A and B) to validate the success of course materials and methods through student response.
2. Create a course packet to provide outlines, worksheets, articles, and handouts in advance. Students purchase these in the bookstore.

2007 Student Surveys:

The items chosen for the survey directly related to student learning. The instructor spent a considerable amount of time improving the course materials, and desired feedback. She successfully provided feedback to students on all learning assessment within one week, and wanted feedback as to the perceived value. Since the instructor had 100% participation during the spring 2007 test reviews and 99% attendance at those reviews held outside of class time, we hypothesized that the students were engaged in the topic of nutrition. Since this course provides a point of entry into the major, and engagement in linked to persistence and retention – we wanted to explore the level of engagement in this primarily lecture based course.

The spring 2007 class was composed of 29 students, distributed as 12 students majoring in nutrition, nine students majoring in health science, and eight students of "other" majors (i.e., Psychology, Political Science, Nursing, Physical Therapy, Writing/Publishing, Sociology/Criminal Justice). In summer 2007, there were five students majoring in nutrition, two in health science/biology, and three in "other" majors (i.e., Accounting, Organizational Leadership, Pharmacy). Using Chi-square, it was uncovered that there were no significant differences between the three disciplinary groupings on the survey responses. An independent samples *t*-test was computed to compare the mean of the two courses.

Students reported a **high level of satisfaction with course materials and methods**. The overall descriptive means for both course sections exceeded 4.0/5.0, the department benchmark goal. The overall mean for the spring course was 4.20/5.00 and the summer course 4.71/5.00. The independent *t*-

test revealed that there was no statistically significant difference in level of satisfaction between the courses, except for the two attributes of test reviews (p = .006) and use of PowerPoint (p =.015), and the overall mean (p = .010) (refer to Table 2). The students in the summer course more strongly agreed with these two statements than those in the spring course (refer to Table 2).

Students agreed that in-class activities were relevant (4.44/5.0) **and helped learning** (4.44/5.0 learning), **PowerPoint was an effective organizational tool** (4.90/5.0 summer; 4.24/5.0 spring), **and that the test reviews were helpful** (4.90/5.0 summer; 4.03/5.0 spring). The organization of the course and the availability of test reviews may have mattered more to students in the summer as the instructor taught the course in an accelerated fashion, over five weeks. **Instructor feedback to the class was extremely prompt** (4.74/5.0), earning the highest overall rating. (Refer to Tables 3 and 4) Students enrolled in the summer course agreed that access to the course materials, or the *Course Pack*, prior to the term start **assisted** in completing work in a timely fashion (4.20/5.0).

Since the summer course was three times faster than the traditional term, an additional question was added to explore the **value** of the summer course. Students in the summer course strongly agreed (4.70/5.0) that **taking the course helped meet long-term goals as a student**.

Students did agree (4=agree) that they were **engaged in conversations with others on the subject matter outside of class** (4.10/5.0) **and during class** (3.95/5.0). A *t*-test revealed no significant difference between these two engagement responses. There was no difference for each response between the two course sections. Despite the predominate lecture style of the course, methods of engagement included test reviews outside of class time, case studies requiring client interviewing outside of class time, small class discussions, and worksheets completed during class. The instructor increased discussion time during the summer session; the descriptive mean for these two engagement items were higher in the summer course. The class size was significantly smaller in the summer, approximately one-third the size of the class size during the semester.

Table 2: Independent Samples *t*-Test

Questions		*t*	*df*	Sig. (2-tailed)	Mean Difference
The test reviews helped me to learn	Equal variances assumed	-2.939	37	0.006	-0.8655
	Equal variances not assumed	-4.424	36.935	0.000	-0.8655
The in-class exercises were relevant	Equal variances assumed	-1.925	37	0.062	-0.4897
	Equal variances not assumed	-2.521	28.860	0.018	-0.4897
The in-class exercises helped me to learn	Equal variances assumed	-1.006	37	0.321	-0.2207
	Equal variances not assumed	-.903	13.237	0.383	-0.2207
Engagement during class	Equal variances assumed	-2.007	37	0.052	-0.6069
	Equal variances not assumed	-1.977	15.279	0.066	-0.6069
Engagement outside of class	Equal variances assumed	-1.692	37	0.099	-0.5345
	Equal variances not assumed	-1.910	20.004	0.071	-0.5345
PowerPoint was an effective tool	Equal variances assumed	-2.560	37	0.015	-0.6586
	Equal variances not assumed	-3.722	35.873	0.001	-0.6586
Feedback was promptly provided	Equal variances assumed	-1.156	37	0.255	-0.2103
	Equal variances not assumed	-1.483	27.392	0.149	-0.2103
Overall mean (questions q2r-q8r)	Equal variances assumed	-2.770	37	0.009	-0.5123
	Equal variances not assumed	-2.894	16.987	0.010	-0.5123

Table 3: Group Descriptive Statistics

Questions	course & term	N	Mean	Std. Deviation
The test reviews helped me to learn	spring 2007	29	4.0345	0.9056
	summer 2007	10	4.9000	0.3162
The in-class exercises were relevant	spring 2007	29	4.3103	0.7608
	summer 2007	10	4.8000	0.4216
The in-class exercises helped me to learn	spring 2007	29	4.3793	0.5615
	summer 2007	10	4.6000	0.6992
Engagement during class	spring 2007	29	3.7931	0.8185
	summer 2007	10	4.4000	0.8433
Engagement outside of class	spring 2007	29	3.9655	0.9056
	summer 2007	10	4.5000	0.7071
PowerPoint was an effective tool	spring 2007	29	4.2414	0.7863
	summer 2007	10	4.9000	0.3162
Feedback was promptly provided	spring 2007	29	4.6897	0.5414
	summer 2007	10	4.9000	0.3162
Overall mean (questions q2r-q8r)	spring 2007	29	4.2020	0.5144
	summer 2007	10	4.7143	0.4714

Table 4: Grand Means

	N	Mean	Std. Deviation
The in-class exercises were relevant	39	4.4359	0.7180
The in-class exercises helped me to learn	39	4.4359	0.5980
Engagement during class	39	3.9487	0.8568
Engagement outside of class	39	4.1026	0.8824
Feedback was promptly provided	39	4.7436	0.4983

The **qualitative feedback supported the strong qualitative scores**. The course strengths identified by students in spring 2007 were:

- The movies and class discussions were interesting yet fun. I've learned so much about nutrition.
- Professor was very understanding and wanted everyone to do well.
- Great, pertinent info
- Common sense information that is useful for every day. But I would suggest giving the copies of the PowerPoint to the students, because we just copied things down instead of listening to the teacher.
- Relevant current information was often discussed, which helped apply the book knowledge to real life situations.
- Lots of memorization, but tons of information. Excellent class.
- Good teacher (, very interesting information.
- Good instructor.
- Very interesting.
- Gives a complete overview of nutrition, but that was a little overwhelming. So much writing! Handouts?
- Case studies.

The course strengths identified by students in summer 2007 were:

- Excellent course.
- Awesome teacher! She really knows her material and she really wants you to learn and do well.

Course Learning Improvement Plans (2007-2008)

Continue to provide experiences that facilitate learning current knowledge and applied skills:

- Course management/scheduling: Continue to offer this course in the summer to facilitate course planning for new transfer students who are nutrition majors. (2008; ongoing)
- Continue to use a course packet, so students can have a course outline, all supplemental readings, worksheets, and handouts in advance (1st completed June 2007 for use in summer 2007 course).
- Continue to provide authentic exemplars and learning experiences (e.g., case studies, label reading, field-based examples)
- Refine assessment tool for case studies through clarification of levels of criteria (rubric creation). Evaluate improvement through tracking grades on assignments and reported instructor efficiency.
- Continue to increase the level of engagement in the classroom. Consider a team-based activity to engage the students and foster learning in the larger class size (35) during the academic year, such as debates on controversial nutrition topics. Evaluate through student response on end of term survey.
- Explore if completion or co-registration of any fundamental science courses are correlated to learning success for this course (e.g., introductory biology course, introductory chemistry course).
- Work with DPD Director to refine final exam so it becomes a life cycle validation test for department use in the future.

Future Links to Program Plans:

Interpret and add the related IDEA survey evaluation information to the next report. Link related information between reports.

Continue to assess development of applied knowledge and skills in students enrolled in NUTR 241 course through IDEA survey (each term of course) and other indirect and direct methods. Continue supplemental survey with questions about engagement. Directly assess learning performance (knowledge of life span nutrition from case studies) from 2007 and 2008.

Collaboratively develop a one-year follow-up report in late summer 2008 (Part II) with DPD Director.

Appendix A: Survey for Spring 2007

(Q1) What is your major?
_____ Nutrition
_____ Health Science/Biology
_____ Other

To what degree do you agree with the following statement, with "5" as strongly agree and "1" as strongly disagree. Circle the letter of the response that most closely matches your opinion.

	In this course:	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Q2	The test reviews helped me to learn					
Q3	The in-class exercises were relevant					
Q4	The in-class exercises helped me to learn					
Q5	The course structure encouraged me to engage in conversations with others on the subject matter during class					
Q6	The course structure encouraged me to engage in conversations with others on the subject matter outside of class					
Q7	The instructor used PowerPoint effectively as an organizational tool for the course					
Q8	Feedback on course assignments was very promptly provided, within a week					

Appendix B: Survey for Summer 2007

(Q1) What is your major?
_____ Nutrition
_____ Health Science/Biology
_____ Other

To what degree do you agree with the following statement, with "5" as strongly agree and "1" as strongly disagree. Circle the letter of the response that most closely matches your opinion.

	In this course:	Strongly Agree (5)	Agree (4)	Neutral (3)	Disagree (2)	Strongly Disagree (1)
Q2	The test reviews helped me to learn					
Q3	The in-class exercises were relevant					
Q4	The in-class exercises helped me to learn					
Q5	The course structure encouraged me to engage in conversations with others on the subject matter during class					
Q6	The course structure encouraged me to engage in conversations with others on the subject matter outside of class					
Q7	The instructor used PowerPoint effectively as an organizational tool for the course					
Q8	Feedback on course assignments was very promptly provided, within a week					
Q9	Taking the class over summer helped me meet my long-term goals as a student.					
Q10	Access to course materials prior to the semester starting assisted me in completing work in a timely fashion.					