

AC 2008-2338: ENGINEERING STUDENTS OPINION ON PE 603100 - SPORTS AND HEALTH: AN INTRODUCTORY PHYSICAL EDUCATION COURSE AT THE HASHEMITE UNIVERSITY IN JORDAN

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Engineering Students Opinion on PE 603100 – Sports and Health: an Introductory Physical Education Course at the Hashemite University in Jordan

Abstract

In general, engineering curricula at most of the universities in the world do not require students to take Physical Education courses. There are a few exceptions, as some universities require such courses. Several engineering departments accept such courses to fill social, humanity and art requirements. This is despite the strong link between physical fitness and mental preparedness. It is acceptable to state that physical activities increase the learning capacity of all students including those in the engineering fields. The Department of Physical Education and Sports Science at the Hashemite University in Zarqa, the Hashemite Kingdom of Jordan offers various courses on physical education. The engineering departments at this university do not require their students to take physical education courses. Nonetheless, many engineering students take physical courses. Up to one third of the students are from engineering majors in introductory physical education courses. This seems to be a strong indication that physical courses are perceived well by engineering students. Qualitative statements like this need to be supported by quantitative assessments. Such assessments can then be used to decide the appropriate policies by various engineering departments on the inclusion or exclusion of physical education in their curricula. This paper at hand is on this specific topic.

The PE 603100 course of: Sports and Health is offered at the Hashemite University by the Department of Physical Education and Sports Science. In one particular section of this course, about 100 students are enrolled. Within this group, 30% of the students have engineering majors. A survey was distributed to these engineering students to gauge their opinions on this specific course. The survey aimed to understand why these students were taking this particular course and its relationship to their engineering education.

Besides gauging the opinion of the students on this specific course, a hypothesis was also formulated by the authors. One part of the hypothesis was the belief that students like this course because they see the importance of physical activities to their education process. It was a surprise however to see that this motivation was not the leading factor in the students decisions to take this course. Instead, the leading factor was to get a good grade in this PE course to balance the grades of the engineering courses they take. Nonetheless, the paper provided a lot of information which might be helpful to decide whether engineering programs should include mandatory physical education courses in their curricula or not.

Introduction

It is a well perceived notion that an individual human being can improve his/her health by performing various physical activities¹. Physical activities are essential for our physical health² as well as our mental fitness³.

However and unfortunately, since the beginning of the industrial age, we have become almost totally dependent on machines to perform our jobs. Mass production machines and equipment are used in farms and factories. Workers in various offices spend much of their time glaring at computers. New technologies have even made it very easy to conduct meetings without the need to leave our offices. At home, we spend a lot of time sitting on comfortable chairs watching television. Our children have become addicted to electronic games. Walking to work has suddenly decreased and seems to be on its way to disappear. All of this has led to a sharp and dramatic decrease in our physical activities. This lack of physical activity seems to be a major factor to the deterioration of our health. The Center for Disease Control (CDC) makes physical inactivity a major health problem⁴. Students including those who are in the engineering field constitute a major part of our societies. They also suffer from this lack of physical inactivity.

Some universities like the Oregon State University have realized the importance of physical activities to the education process itself and mandate their students to take a certain number of physical education courses. It is interesting to note that a few universities within this group of universities like Notre Dame University, the Massachusetts Institute of Technology and King Fahd University of Petroleum and Minerals in Saudi Arabia, require passing a swimming test before graduation. Lake Fingers Community College in the State of New York does not even exempt disabled students from taking the mandatory physical education courses.

It is however sad to note that many universities do not even understand the importance of physical activities in the education process. Based on the observations of the two authors, most of the universities world-wide will not accept physical education courses for credit towards graduation.

Several universities however, like Tufts University, seem to have realized that physical activities are important to their students but cannot mandate their students to take physical education courses for various reasons. Alternatively, they offer their students the option to take physical education courses to fill their elective courses.

The College of Engineering at the Hashemite University in Zarka, Jordan allows its students to take physical education courses as elective courses. The Department of Physical Education at this university offers several courses to all students in general including those who are majoring in the engineering field. In other words, engineering students enroll in these courses and sit side by side with other students in these courses.

The authors wanted to get quantitative information on those engineering students who opt to take physical education courses as electives at the Hashemite University in the city of Zarka, Jordan. A specific course was chosen. A sample was randomly selected, and a survey was conducted.

The Hashemite University

The Hashemite University is one of the major public universities in the Kingdom of Jordan. It is located in the city of Zarka, the second largest city behind the capital Amman. The city of Zarka is 25 kilometers to the north of Amman. The university was founded in 1995. There were only three colleges when it was established, and only 600 students were enrolled at that time. In the 2007/2008 academic year, the university's enrollment stands at 18,000 students in twelve colleges. Forty nine departments offer Bachelor's degree while eighteen departments offer Master's degrees⁵.

The College of Engineering

The College of Engineering was established in 1998. It houses the departments of: Civil, Mechanical, Industrial, Electrical, Biomedical, Computer, and Architectural Engineering. These offer the Bachelor's degree while a Master's degree is available in some of these departments in the Maintenance Management, Inspection Technology, and Nondestructive Evaluation. There are eighty three faculty members at all ranks and fifty engineers and technicians. The College enrolls 2,980 students⁵.

The PE 603100 Sports and Health Course

PE 603100 Sports and Health Course is a three credit course offered by the Department of Physical Fitness in the College of Physical Education and Sports Sciences to all university students from all majors. It covers various aspects of practicing physical activities and their associated benefits.

The Investigation: its Hypothesis and Importance

Engineering students at the Hashemite University are not required to take physical education courses. They do have the option to take physical education courses to fulfill their elective courses requirements. One of the authors of this paper is a faculty member in the College of Physical Education and Sports Sciences. He teaches several physical education courses including the PE 603100 Sports and Health Course. He is also the Dean of Students Affairs. He interacts extensively with students through his position. He has noticed based on these two sets of responsibilities that many engineering students opt to take the PE 603100 Sports and Health course. He conveyed this information to the other author who is an engineering faculty at an American institute.

This seems to be a strong indication that physical education courses are perceived well by engineering students. That is, the two authors speculated that engineering students like physical

education courses. This constitutes the hypothesis of this study. It is a well founded fact that “physical activity is associated with positive mental well being.⁷” That is, students can improve their education by undertaking physical education courses. It is the opinion of the two authors that the engineering curriculum at all universities should include mandatory physical education courses. This opinion is supported by the above observation. Qualitative statements like this need to be supported by quantitative assessments. A survey is an appropriate tool in this regard.

Such assessments can then be used to decide the appropriate policies by various engineering departments on the inclusion or exclusion of physical education in their curricula.

The Survey

A survey was designed to explore what motivates engineering students to take the PE 603100 Sports and Health course. Six faculty members in various departments at the Hashemite University reviewed the blank survey and provided their comments. All of them agreed that this survey seem to be appropriate and well designed to achieve its stated objectives.

The objectives of this survey include:

1. Identifying what motivates engineering students to take the PE 603100 Sports and Health course.
2. Listing such motivations based on their importance to the engineering students.
3. Identifying the most important and the least important motivations.
4. Exploring the correlation between students’ gender and the above motivations.
5. Exploring the correlation between the above motivations and the students based on their corresponding year.

The goals of this study include:

1. Understanding these motivations within a framework that can be used as a reference
2. Furnishing information needed for strategic planning for the PE 603100 Sports and Health course itself in order to better serve students in general and engineering students in particular.
3. Helping administrative authorities on their policy decisions in general, and with regard to curriculum development in particular.

The survey contained two parts. The first part was designed to gather information about the engineering students who participated in this survey in general while the second part was specifically on the motivations behind taking the PE 603100 Sports and Health course as an elective.

Part I asked the engineering student to identify his/her:

- Gender:
 - Male
 - Female
- Engineering field:
 - Civil
 - Mechanical
 - Industrial
 - Electrical
 - Biomedical
 - Computer
 - Architectural
- Year of study:
 - Freshman
 - Sophomore
 - Junior
 - Senior
- Type of required internship
 - International
 - Competitive
- Accumulative grade point average (GPA) on a scale of 4
 - Excellent (3.50 - 4.00)
 - Very Good (3.00 - 3.49)
 - Good (2.50 - 2.99)
 - Acceptable (2.00 - 2.49)
 - Poor (less than 2.00)

Part II asked the engineering students to rate their motivations behind taking this course based on a scale of 5 as follows:

Strongly agree: 5

Agree: 4

Neither agree nor disagree: 3

Disagree: 2

Strongly disagree: 1

Thirty six motivations were identified and listed in the survey. These are listed in Table 1.

Table 1. Blank Motivations List

No.	Motivation	Strongly Agree	Agree	Neither Agree Nor Disagree	Disagree	Strongly Disagree
1	The desire to raise the GPA					
2	The desire to learn information and skills outside engineering courses					
3	The PE course suits my interests and hobbies					
4	The PE course is offered through many sections at different times all year long					
5	The course is simple and easy to understand					
6	There are no prerequisites for this course					
7	The desire to meet and interact with students from other fields and different university years					
8	Utilizing the information in this course to fulfill various life demands					
9	The course contains various subjects that can be used in daily life					
10	It is easy to evaluate the course					
11	The way in which the material of the course is explained in class, and the manner in which this material is spread over the course time					
12	It is possible to be self-dependent in this course					
13	The availability of a unified text for this course in the Arabic Language					
14	No need to prepare before class					
15	The physical activities part of the course					
16	Increasing my general knowledge					
17	It is easy to summarize important points during class					
18	The students have equal standing in class					
19	Some of the tests are offered online					
20	My friends in college encouraged me to take this course					

21	The friendliness of the instructor					
22	The instructor is easy to understand					
23	The course material is small					
24	The course does not require extra work outside its scope					
25	The course has nothing to do with my major					
26	I was forced to take this course					
27	Previous students speak highly of this course and they recommend taking it					
28	The advice of the academic advisor					
29	The large number of students who take this course					
30	Many of my friends registered for this course					
31	The recommendation of my friends who are in the College of Physical Education and Sports Sciences					
32	The desire to practice physical activities					
33	My love for sports					
34	The title of the course is attractive and interesting					
35	I have a certain health problem and the desire to learn more about it through this course					
36	Taking a break from the routine engineering and science course					

The Sample

There were a total of ten sections for the PE 603100 Sports and Health Course in the Fall of 2007. Table 2 lists the total number of students in each section as well as the number of those students who are majoring in engineering.

Out of these sections, only three sections were randomly chosen to conduct this study. None of these sections were taught by the author who is at this Jordanian institute. Table 3 lists these sections and their meeting times.

Table 2: General Distribution of Students in PE 603100 in the Fall of 2007

Section	Number of Engineering Students	Total Number of students
1	31	103
2	18	102
3	22	101
4	22	100
5	24	104
6	16	107
7	26	98
8	10	97
9	21	103
10	13	103

Table 3: The Sample of the investigation

Chosen Section	Number of Engineering Students	Total Number of students	Meeting Time	Days
2	18	102		Tues & Thurs
7	26	98	11:00-12:30 PM	M&W
9	21	103	9:30-11:00 AM	M&W
Total	65	303	-	-

Data Collection

One of the two investigators coordinated with the instructors of the three chosen sections. Permission was granted by these instructors to conduct the survey. A date was set for this purpose. That date was December 24, 2007. On that day, the author visited each of the three classes. The last thirty minutes of the class were allocated for this purpose. The investigator explained to the students that we kindly ask the input of the engineering students for research purposes. Non-engineering students did not participate in this survey. Further, it was made clear that this is an anonymous survey and none of it will be furnished to the instructors of the course and therefore, the grades will not be affected by the responses of the participating students. It was also emphasized that participating in this survey is totally voluntarily and those who do not wish to participate fully or partially are free to do so.

Results, Observations, and Data Analysis

Out of 65 students, 58 students opted to participate in this investigation. That is, the participating rate was 89%.

Table 4 lists a summary of the responses to all 36 motivations in an descending order with the standard deviation values.

Table 4: Summary of the survey responses

Motivation No. (Please refer to Table 1)	N: Number of participants	Mean Value (5 max)	Std. Deviation
1	58	4.69	0.65
8	58	4.19	0.89
27	58	4.17	0.82
9	58	4.17	0.82
12	58	4.16	1.09
5	58	4.05	0.74
4	58	3.97	1.09
16	58	3.95	0.94
33	58	3.93	1.32
19	58	3.91	1.27
20	57	3.86	1.03
10	58	3.83	0.82
14	58	3.71	1.09
3	58	3.67	1.13
2	58	3.60	1.23
13	57	3.60	1.39
6	57	3.53	1.45
17	58	3.50	1.00
34	58	3.48	1.34
24	58	3.47	1.35
25	58	3.45	1.45
36	57	3.39	1.47
32	57	3.37	1.53
30	58	3.36	1.47
11	58	3.31	1.01
7	57	3.25	1.41
23	58	3.19	1.29
22	58	3.17	1.44
29	58	3.16	1.39
15	58	2.76	1.41
35	58	2.74	1.41
21	56	2.55	1.48
18	58	2.48	1.33
31	58	2.36	1.50
28	58	2.09	1.25
26	58	1.98	1.21

It is clear that the most important factor behind choosing the course as an elective was getting an easy grade and raising the GPA at a mean value of 4.69 out of 5.00. This seems to be supported by the fact that the faculty members in the College of Engineering at this institute tend to be very tough when it comes to grading. Table 5 lists the responses to this specific motivation

Table 5: Frequency Table for Motivation 1 (The desire to raise the GPA)

Rating	Frequency	Percentage
Strongly agree: 5	45	77.6%
Agree: 4	9	15.5%
Nether agree nor disagree: 3	3	5.2%
Disagree: 2	1	1.7%
Strongly disagree: 1	0	0%
Total	58	100%

Next to the above motivation was motivation No. 8, which states that students opt to take this course to use it in their practical daily lives.

As expected, not many students took this course because they were forced to do so. The mean value for this factor was only 1.98 out a maximum value of 5.00. Table 6 shows the frequency values for this motivation.

Table 6: Frequency Table for Motivation 26 (Students were forced to take the course)

Rating	Frequency	Percentage
Strongly agree: 5	32	3.4%
Agree: 4	3	6.9%
Neither agree nor disagree: 3	17	29.3%
Disagree: 2	4	5.2%
Strongly disagree: 1	2	55.2%
Total	58	100%

It was a surprise to see that engineering students were not highly motivated to take this course because of its physical activity aspects. Its mean value did not even make it to the 3 mark (Neither agree nor disagree). Its mean value was 2.76. Motivation 15 did not score well with other motivations. Twenty nine other motivations were more important than this factor. Only 6 other factors scored less mean values than this factor of physical activities. Table 7 shows the frequency values for this motivation.

Table 7: Frequency Table for Motivation 15 (physical activities aspects the course)

Rating	Frequency	Percentage
Strongly agree: 5	8	13.8%
Agree: 4	11	19.0%
Neither agree nor disagree: 3	14	24.1%
Disagree: 2	9	15.5%
Strongly disagree: 1	16	27.6%
Total	58	100%

Tables 8-11 give the univariate analysis of variance and some details about the effect of sex and the year at university on the tested 36 factors.

Table 8: Between Subjects Factors

Gender	N
Male	40
Female	18
Total	58

Table 9: Between Subjects Factors

Year	N
Freshman	0
Sophomore	15
Junior	37
Senior	6
Total	58

Table 10: Descriptive Statistics

Gender	Year	Mean	Std. Deviation	N
Males	Freshman	-	-	-
	Sophomore	121.54	16.42	13
	Junior	126.09	17.76	22
	Senior	122.80	14.29	5
	Total	124.20	16.68	40
Females	Freshman	-	-	-
	Sophomore	121.50	10.61	2
	Junior	120.13	16.82	15
	Senior	151.00	N/A	1
	Total	122.00	17.09	18
Total (Males)	Freshman	-	-	-

and Females)	Sophomore	121.53	15.46	15
	Junior	123.68	17.40	37
	Senior	127.50	17.20	6
		123.52	16.69	58

Table 11: Tests of Between Subjects Effects

Source	Type III Sum of Squares	df	Mean Square	F	Significance
Gender	260.99	1	260.99	0.920	0.342
Year	624.74	2	312.37	1.102	0.340
Gender x Level	902.45	2	451.23	1.591	0.213
Error	14744.08	52	283.54		
Total	15878.48	57			

The data from the survey provide no evidence that factors of gender and year of study have an effect on the responses of the surveyed students.

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References

1. Marti, H., and Carol, C., "Measurement of Physical Activity, Exercise and Physical Fitness in Children- Issues and Concerns," *Journal of Pediatric*, Vol. 15, No. 3, 2000.
2. Ainsworth, B. E., and Tudor-Locke, C., "Health and Physical Activity Research as Represented in RQES," *Research Quarterly for Exercise and Sports*, No. 76, 40-52, June 2005.
3. Powell, K. E., Thompson, P. D., Casperson, C. J., and Kendrick, J. S., "Physical Activity and the Incidence of coronary heart Disease" *Annual Review Public Health*, No. 8, 253-287, 1987.
4. Brener, N. D., Burgeson, C. R., Spain, C. G., Wechsler, H., Young, J. C., "Physical Education and Activity: Results from the School Health Policies and Programs Study 2000," *Journal of Physical Education, Recreation & Dance*, Volume 74, 2003.
5. The Hashemite University Press, *Annual University Book*, 2007.
6. Attila, Szabo, "Acute Psychological Benefits of Exercise Performed at Self-Selected Workloads: Implications For Theory and Practice," *Journal of Sport, Science, and Medicine*, No. 2, pp 22-87, 2003.