BOISE STATE UNIVERSITY
OFFICE OF INSTITUTIONAL RESEARCH

Do students have lower grades in the next course when one of the courses is offered during a shortened summer term?

This study was requested by the Alternate Calendar Committee to ascertain whether or not students who took shortened summer courses learned less in the course, presumably because less extended time for learning was available.

The study was based on the following set of "linked courses" that typically are offered during the summer term:

- BIOL 227 and BIOL 228
- CHEM 111 and CHEM 112
- ENGL 90 and ENGL 101
- ENGL 101 and ENGL 102
- MATH 25 and MATH 108
- MATH 108 and MATH 143/147
- MATH 147 and MATH 170
- MATH 170 and MATH 175
- PHYS 111 and PHYS 112
- SPANISH 101 and SPANISH 102
- SPANISH 201 and SPANISH 202

Each set of paired course grades was assigned to a group: (a) first course taken in the summer and second course in the fall, (b) first course taken in the fall and second course in the spring, and (c) first course taken in the spring and second course in the summer. Each pair had to occur during adjacent semesters in order to be included in the study. The study covered the semesters between spring 2008 and spring 2011 and included 6,560 pairs of grades (617 for summer-to-fall, 5,328 for fall-to-spring, and 615 for spring-to-summer). Grades of "W" were included in the study and assigned a grade point value of 0.0.

Though all fall and spring terms included in the study all consisted of 15 weeks, the length of the summer terms varied. As shown by Table 1, over 60% of the summer courses included in the study were eight weeks in length, with most of the remaining courses lasting five weeks.

Table 2 displays the mean grades for the first course, mean grades for the second course, and mean difference between grades when the second grade is subtracted from the first. The mean difference in grades for students who took the course pair in summer-to-fall and spring-to-summer was compared to the mean difference between courses for those who took the pair of courses during the regular academic year (fall-to-spring control group). Note that grades in the second course were generally lower than grades in the first course.

By subject area, Chemistry and Physics showed a pattern where students who took their first course in the summer had a larger drop in grade compared to those who took their first course in the fall; none of the other areas (Biology, English, Math, or Spanish) showed this difference. However, English and Spanish showed a different pattern where students who took the first course in the spring and the second course in the summer actually showed a significant improvement in their performance in the second course compared to fall-to-spring course takers. No differences were found for Biology and Mathematics for any comparison. Mean differences in grades among the three groups were first compared using Analysis of Variance, with follow-up post hoc differences tested using Dunnett's *t* and the fall-to-spring group as the control.

The impact of the mode of instruction (in-person or on-line) on performance was also assessed. Almost all (94.5%) pairs of courses were taken face-to-face. Only 1.9% of the course pairs were taken on-line, and 3.6% were mixed between in-person and on-line. An overall analysis indicated that the method of delivery had no impact on course grades. Results by group are shown in Table 3.

Based on these results, it appears that when discussing the impact of a shortened term on grades we need to consider the subject matter but probably not the mode of instruction. Readers are cautioned, however, that students who take courses in the summer may differ in various ways from students who only enroll during the fall and spring. Summer students may be more motivated to complete their degree quickly. They may have had to start in the summer due to lower admission scores. They may have been unable to take the course during the regular academic year due to any number of reasons, including procrastination in registering. The impact of differing instructors' course content and grading practices further obscure the results.

Table 1. Number of enrollments in summer courses based on course length and group (summer-to-fall or spring-to-summer)

Length of Summer Session	Summer-to-fall group enrollments	Spring-to-summer enrollments	Percent of all summer enrollments included in study
Three weeks	0	5	0.4%
Five weeks	171	249	34.1%
Eight weeks	433	346	63.2%
Ten weeks	13	15	2.3%
Total	617	615	100%

Table 2. Mean Comparisons Based on Which Semesters the First and Second Courses Were Taken and Subject Area

Group	N in Group	Mean grade 1st Course	Mean grade 2nd Course	Difference in Means	Significant difference in means
Biology					
Summer to Fall	51	2.93	2.75	0.18	NS
Fall to Spring	987	2.75	2.52	0.23	(control)
Spring to Summer	64	3.01	2.70	0.30	NS
Chemistry					
Summer to Fall	23	2.93	2.29	0.64	***
Fall to Spring	395	3.02	2.77	0.25	(control)
Spring to Summer	90	3.08	2.62	.46	NS
English					
Summer to Fall	184	2.85	2.58	0.28	NS
Fall to Spring	2,125	3.24	2.96	0.27	(control)
Spring to Summer	136	3.08	3.31	-0.22	***
Math					
Summer to Fall	305	2.96	1.90	1.06	NS
Fall to Spring	1,421	3.01	1.94	1.07	(control)
Spring to Summer	275	3.06	2.14	0.92	NS
Physics					
Summer to Fall	16	3.69	3.27	0.42	***
Fall to Spring	171	3.33	3.34	-0.01	(control)
Spring to Summer	21	3.26	3.49	-0.23	NS
Spanish					
Summer to Fall	38	3.62	3.14	0.48	NS
Fall to Spring	229	3.35	3.05	0.30	(control)
Spring to Summer	29	3.27	3.39	-0.12	***
Total					
Summer to Fall	617	2.98	2.30	0.68	***
Fall to Spring	5,328	3.08	2.61	0.47	(control)
Spring to Summer	615	3.08	2.63	0.45	NS

****indicates statistically significant differences at the .05 level

Table 3. Number of enrollments and mean difference in grade by course delivery method

Group	Delivery Method	N in group	Mean difference (Course 1 – Course 2)
Summer to fall	Both in-person	558	0.70
	Both on-line	16	0.43
	Mixed	43	0.55
Fall to spring	Both in-person	5,104	0.46
	Both on-line	103	0.35
	Mixed	121	0.91
Spring to summer	Both in-person	535	0.51
	Both on-line	7	1.49
	Mixed	73	-0.11

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