California State University, Fresno State
Student Survey on General Education

By
William P. Stock, Ph.D.

Two years ago a review began of upper division general education courses to determine student and faculty perceptions, experiences, behaviors, and evaluations of their course experiences. At California State University, Fresno, upper division general education courses (integration) are organized into four areas: Physical Universe and Its Life Forms (Area IB); Arts and Humanities (Area IC); Social, Political, and Economic Institutions and Behavior, Historical Background (Area ID); and Multicultural/International (Area MI).

The review was multifaceted in that three major components occurred more or less simultaneously by GE Area: the student survey, the faculty survey, and a curriculum (syllabus) review. These activities were spread out over a two year period commencing Fall 2002 and ending Spring 2004. This report concerns itself only with the student survey component.

Methodology

The survey was developed during the 2001-2002 academic year with principal author being Dr. Priscilla Chaffe-Stengle of the School of Business. Numerous individuals were consulted in development of the survey, and Dr. William Stock composed the final product using specialized software designed to make the survey readable by an Optical Mark Reader (OMR). Ultimately, 5,500 surveys were ordered from Scanning Dynamics in Minnesota, and actual processing of the surveys into an SPSS system file was achieved using an OMR housed in the Office of Testing Services.

The survey itself is five pages long and consists of the following sections:

- Student Background (Demographics-Items 1 to 10)
- Skills Acquired or Enhanced (Bloom's Taxonomy – Items 11 – 16)
- Number of Specific Class Activities or Requirements (Items 17-28)
- Learning Acquired from Instructional Modalities (Items 30-35)
- Interpersonal Activity (Items 36-39)
- Syllabus (Items 42-44)
- Communications Aspects (Items 47-53)
- Course Priorities (Items 62-65)
- Area-Specific Items (Items 66-85)

Items not listed above are not readily categorized. Students were requested, but not required, to provide their student identification number in order to link survey responses to student-specific data elements already on file in the Student Information System.

Since the student survey was intended as a complete census, Table 1 below shows the degree to which this goal was realized:

Table 1

Student Cohorts with Respect to General Education Survey

	IB (F 2002)	IC (Sp 2003)	ID (Sp 2004)	MI (Sp2004)	Totals
Course Registrations	912	1,637	2,275	2,378	7,202
Surveys Administered	678	1,148	1,537	1,522	4,885
Surveys with Student ID	439	870	952	856	3,117
Valid P.S. Links Returned	417	786	838	740	2,781
In Final Survey File 7/9/2004	418	791	860	753	2,822

Note: The difference between lines 4 and 5 in the above table represent 41 students taking multiple GE courses in a given area of GE (Integration) in the semester survey was conducted.

As can be deduced from the above table, the "Final Survey File" included both survey information and People Soft data elements for 39.2 percent of course registrants. "Surveys administered" totaled 67.8 percent of course registrants.

Most classroom contact was handled by a student organization – Pi Sigma Epsilon – which received an honorarium for their work. Faculty contact for the most part was handled by Dr. Stock.

Data Analysis

The goals of analysis of the student survey were fivefold:

- Provide descriptive information of student responses
- Construct psychometrically-sound scales to examine differences in emphasis between areas of GE
- Address the question of whether systematic variability in global outcomes is greater among GE areas or among courses
- Examine which background factors (e.g. freshman/transfer status, g.p.a., etc.) are most important in explaining course outcome measures
- Look at student understanding of the relation between course goals and the goals of the General Education program (question 46)

Attached are frequency distributions, descriptive statistics (where appropriate), and a few t tests or one way analyses of variance for the 65 items on the parent survey. The 21 items specific to only one area of general education are not summarized or discussed except for several items common to ID and M/I relating to student preferences for the library expansion; this information was forwarded to Dean Gorman at the end of April. Student responses on the parent survey are broken down by GE Area. Two cross tabulations (see immediately below) indicate student enrollment by class level (Table 2) and the relation between expected grade and actual grade received (Table 3).

Table 2

Enrolllment in General Education (Integrated) Course by Class Level

	Area									
	Science/Math		Arts/Humanities		Social Science		Multicultural/International		Total	
	Count	Column %	Count	Column %	Count	Column %	Count	Column %	Count	Column %
Freshman	1	0.2%	2	0.2%	8	0.5%	11	0.7%	22	0.5%
Sophomore	40	6.0%	106	9.5%	209	13.7%	132	8.8%	487	10.1%
Junior	309	46.7%	549	49.1%	756	49.6%	729	48.5%	2,343	48.7%
Senior	312	47.1%	460	41.2%	552	36.2%	632	42.0%	1,956	40.7%
Total	662	100.0%	1,117	100.0%	1,525	100.0%	1,504	100.0%	4,808	100.0%

The above table shows that 10.6 percent of enrollees in Upper Division courses during the period of the study had not yet attained upper division status. Variability by GE area is apparent with Science/Math lowest at 6.2% and Social Science highest at 14.2%.

Table 3

Crosstabulation of Expected Grade with Actual Grade Received

		Actual Grade Received					Total
		.00 F	1.00 D	2.00 C	3.00 B	4.00 A	
1.00 D	Count	0	1	0	1	0	2
2.00 C	Count	22	39	131	61	15	268
3.00 B	Count	17	43	287	531	254	1,132
4.00 A	Count	8	4	93	346	739	1,190
Total	Count	47	87	511	939	1,008	2,592

Overall, Table 3 shows that 1,402 (54.1 percent) of the student respondents correctly guessed their actual course grade. The table is not square since no student anticipated receiving an "F". Congruency between actual versus expected grade by GE Area is shown below:

Science and Math	59.2%
Arts and Humanities	59.3%
Social Science	47.4%
Multicultural/International	53.9%

Two questions on the survey possibly can shed light on students' ability to correctly anticipate their course grade:

54. How timely was the feedback from the professor on the work you turned in?
55. How frequently did you get written comments from the professor on the work you turned in?

One way analyses of variance with GE Area being the independent variable yielded inconclusive results. Question 54 offered a Likert scale with five choices ranging from not timely to very timely, and question 55 has a similar scale with choices ranging from never to often. In both cases higher scores are more favorable. Mean scores by GE area follow:

GE Area	Timeliness Of Feedback	Frequency Of Feedback
Science and Mathematics	3.80	3.80
Arts and Humanities	3.80	3.86
Social Sciences	3.92	3.26
Multicultural/International	3.87	3.41

While the overall analysis of variance test produced a significant F for both questions, this alone does not tell us very much. The so-called homogenous subset posthoc tests, however, suggest no differences among GE areas for timeliness of feedback and qualitative differences between IB and IC (set one), ID (set two) and M/I (set three), which is exactly the same rank order for which students are able to correctly anticipate their course grade. This finding tends to suggest that student ability to correctly anticipate their course grade is related to frequency of instructor feedback.

Scale Construction

Nunnally (1978) indicates that it is always preferable to use multiple items (i.e. scales) to measure psychological and educational constructs. The use of scales reduces measurement error, reduces "noise" caused by the tendency of single items to correlate with multiple factors other than the one being measured, and facilitates finer distinctions among people. Considerable time was spent analyzing the student survey for clusters of items that would yield meaningful and psychometrically defensible scales. Face validity (ostensibly related items), an acceptable reliability (Cronbach's alpha of .75 or higher), and achievement of scale additivity were the criteria for validation of a scale. In conjunction with additivity, it was necessary to use a power transformation for scale items. The resulting scales, tentative names, and constituent items follow:

Cognitive Skills – Items 11-16
Communications – Items 47-53
Course Priorities – Items 62-65

Other groupings of survey items failed to meet the aforementioned criteria for constituting a scale. The scales were next subjected to an analysis of variance to see if systematic differences existed between the four areas of general education. Such differences, if they in fact do exist, may reflect intentional differences in emphasis among the different disciplines. For example, it is not unreasonable to expect that communications would be less emphasized in Area IB than in the other areas.

For the Skills scale (items 11 – 16), the overall result of the analysis of variance was statistically significant but with a small effect size (partial eta-squared). Differences in mean scores for items among the different GE areas are shown in the table below:

Mean Scores (transformed by power function) Respondents Reported for Items 11- 16 by GE Area

	Area				
	Science/Math	Arts/Humanities	Social Science	Multicultural/International	Total
	Mean	Mean	Mean	Mean	Mean
V11	26.87	26.79	27.59	26.51	26.97
V12	26.46	27.84	28.46	28.00	27.89
V13	23.93	26.88	27.45	27.39	26.81
V14	24.85	27.92	27.58	27.33	27.20
V15	21.90	22.96	23.79	23.36	23.20
V16	23.49	25.63	25.86	25.30	25.30

A pair-wise, posthoc comparison among item means indicates that items 13 (ability to apply what you have learned in varied contexts), 14 (ability to analyze logical relationships…...), and 16 (ability to evaluate methods, ideas, solutions, and achievements) are perceived as significantly lower by respondents in Area IB than by respondents in all other GE areas. Similar results (overall significant F value for the scale, small effect size, and at the transformed item level significant pair-wise differences among the four GE areas) were obtained for the communications and priorities scales. For the communications scale, mean item responses were lower among IB respondents than among the other respondents with one notable exception; social science respondents were least likely to agree that they "regularly read the comments that the professor gives me on work I have turned in". Finally, for the priorities scale, one significant result stood out from other findings: IB students were far less likely to agree with the statement that a course priority was to encourage meaningful communication among the students.

Variability in Global Course Outcomes

One question of potential interest is whether variance in curriculum, instructional style, and other global outcomes is greater for GE Area or across constituent courses. The three scales discussed above and two items not a part of the scales were selected as global outcomes measures. Since courses are nested within GE area, a nested analysis of variance design was used as the statistical test to see if the main effect of GE area or course nested within area accounted for greater variability in the global outcome measures selected as dependent variables. Partial eta-squared associated with area and course within area are shown below:

Global Measure	Area	Course Within Area
Skills	.006	.127
Communications	.038	.240
Priorities	.010	.121
Item 40 – Worked very hard to meet instructor's standards	.004	.080
Item 45 – Standards for student work in this course are high	.003	.120

Partial eta-squared is interpreted as the proportion of variance in the dependent variable accounted for by the factor under consideration. In the above table the interesting aspect to note is not the absolute values of eta-squared (which are low) but rather the relatively high ratio of course within area to area. This would sustain the common sense expectation that students perceive global outcomes more of as a result of instructor or course differences than overriding curricular blueprints for the four GE areas.

Student Outcomes

Course grade, while not necessarily the best indicator of student gains in a course, is nevertheless an important component of the academic experience. Using a technique called Exhaustive CHAID (chi-squared automatic interaction detection), the following independent variables were used to predict actual student grades in their course:

- What semester grade do you expect in this class?
- What is the average number of non-class hours per week you devote to this course?
- Has the average number of non-class hours you spent been adequate for this course?
- What is the average number of hours you were employed per week this semester?
- What is your gender?
- What is your native language?
- Ethnicity
- Total grade point average
- Total units completed

Among these variables, expected grade in the course and actual grade point average accounted for 75.1 percent of the variance in final course grades. However, since only a subset of survey respondents provided a link to People Soft data elements, this analysis was restricted to 1,303 of the 4,885 students completing the survey.

Two other important variables were tested to see if they bore any significant relation to actual grade received in the course: admissions basis code (i.e. native freshman or transfer) and EPT and ELM history. Surprisingly, these two variables proved to be almost completely unrelated to final course grade. Perhaps the time interval between admission and taking the examinations on the one hand and completion of the course has something to do with this result.

In addition to course grade, and in recognition that general education exists to equip students with skills that transcend their major and are important in producing good citizens for the future, additional analyses were performed to see if specific cohorts of students seem to respond positively to the items and total scale described above as "skills" (items 11 – 16). In this analysis the emphasis is not upon how well course grade can be predicted but rather upon whether or not there is any systematic variation among important outcome measures for commonly used predictors: ethnicity, gender, admissions basis, and effort (hours spent per week on the course).

Of the four independent variables examined, only hours spent per week on the course achieved statistical significance in this model (all other main effects and interactions were insignificant at an alpha level of .001). While the associated effect size was not impressive, examination of *post hoc* tests revealed that for the transformed skills scale marked improvement seems to occur when a student devotes at least 1 to 2 hours per week on course requirements and another improvement if the student devotes more than eight hours a week. The positive correlation between self-reported skills acquisition (Bloom's taxonomy of cognitive objectives) and hours spend outside class on the course is also apparent at the item level. Shown below is a cross tabulation of item 11 (How well has this class given you the knowledge to recognize and recall facts and terminology for this area of General Education?) and self-reported hours spent on course requirements per week:

Observed Values, Expected Values & Adjusted Standardized Residuals - Effort Expended vs. Recall Skill

		G.E.					
		Not at All	Code 2	Somewhat	Code 4	Extremely Well	Total
What is the average number of non-class hours per week you devote to this course?	0 hours	13	12	32	17	10	84
		1.6	3.4	28.2	33.1	17.7	84.0
		9.1	4.8	0.9	-3.6	-2.1	
	Less than 1 a week	24	39	329	268	102	762
		14.6	31.0	255.4	300.4	160.6	762.0
		2.7	1.6	6.2	-2.6	-5.7	
	1 up to 2 hours a week	24	70	661	723	323	1,801
		34.6	73.3	603.6	710.0	379.5	1,801.0
		-2.3	-0.5	3.6	0.8	-4.1	
	2 up to 5 hours a week	23	56	488	724	454	1,745
		33.5	71.0	584.8	687.9	367.7	1,745.0
		-2.3	-2.3	-6.1	2.2	6.3	
	5 up to 8 hours a week	3	16	95	152	103	369
		7.1	15.0	123.7	145.5	77.8	369.0
		-1.6	0.3	-3.3	0.7	3.4	
	More than 8 hours a week	6	4	17	24	28	79
		1.5	3.2	26.5	31.1	16.6	79.0
		3.7	0.5	-2.3	-1.7	3.2	
Total		93	197	1,622	1,908	1,020	4,840
		93.0	197.0	1,622.0	1,908.0	1,020.0	4,840.0

The top number in each cell is the number of students choosing that combination of responses, the second number the expected number (assuming even distribution of responses, and the third number is the adjusted standardized residual which is a measure of discrepancy between the actual and expected frequencies in each cell. In this situation, the "desired" outcome occurs when the residual is positive along a rough diagonal from the upper left to the lower right cells. That pattern is evident in the table above.

Similar cross tabulations were constructed for the other five items in the skills scale with similar results. In general, it would appear that students are aware of and realistic about the relation between effort expended outside class and abilities learned or enhanced as a result of their experiences in that class.

One final measure with respect to course outcomes is student perception as to whether or not the course met the objectives stated in the syllabus (item 44). A companion item (43) asked respondents to indicate whether or not course objectives were clearly stated in the syllabus. Since some 96.7 percent of student respondents replied in the affirmative (see tables at back of this report), it might be useful to see if there is any relation between effort expended and perceived congruency between the course syllabus and actual course experiences. Again, using a methodology similar to that described immediately above, the relationship is clear with perceived congruency related to effort expended.

Student Understanding of the Goals of General Education

Item 46 of the survey asked respondents, "How adequately do you understand the ways in which this course reflects the goals of the General Education program?" A summary of responses is shown below:

	Number	Percent
I understand how the specific goals of this course relate to the overall goals of General Education	3,364	70.5
I understand the specific goals of this course but do not understand their relation to General Education	1,011	21.2
I do not understand the specific goals of this course but do understand the goals of General Education	221	4.6
I don't really understand the goals of this course or those of General Education	176	3.7
Total	4,772	100.0

While 70.5 percent of respondents report that they have been able to relate the goals of their course to the overall goals of General Education, some 29.5 percent of respondents report partial or complete inability to make the connection. In order to see if there is any relation between actual course grade and understanding of course and General Education goals, a one-way analysis of variance was performed. Surprisingly, the only significant difference among average course grade for the four response options occurred between total understanding (first response option) and understanding of GE but not the goals of the course (third response option). Respondents choosing the fourth option actually had on average a higher course grade than those choosing the third response option (2.79 vs. 2.56). The implication seems to be that some thought should be given to inclusion of a brief statement in the syllabus relating course goals to the appropriate area of General Education and/or taking a few minutes of class time to make this connection clear.

Library Expansion

During the last semester of the survey process (Spring 2004) students in GE Areas ID and MI were asked a series of supplemental questions regarding their preferences for utilization of space in the library expansion, which is scheduled to be completed in 2008.

Frequency Distributions and Estimated Mean Use of Proposed Uses for New Library Space				
		Count	Column %	Mean
Browsing room for leisure reading	Never	936	32.9%	
	Once a month	626	22.0%	
	Twice a month	424	14.9%	
	Once a week	431	15.1%	
	More than once a week	428	15.0%	
	Total	2,845	100.0%	2.57
Silent study areas	Never	547	19.2%	
	Once a month	611	21.5%	
	Twice a month	465	16.3%	
	Once a week	563	19.8%	
	More than once a week	661	23.2%	
	Total	2,847	100.0%	3.06
Group study areas	Never	830	29.2%	
	Once a month	791	27.8%	
	Twice a month	572	20.1%	
	Once a week	353	12.4%	
	More than once a week	296	10.4%	
	Total	2,842	100.0%	2.47
Group study areas with computer access and capability	Never	786	27.6%	
	Once a month	645	22.7%	
	Twice a month	521	18.3%	
	Once a week	399	14.0%	
	More than once a week	492	17.3%	
	Total	2,843	100.0%	2.71
Area in which cell phone use is allowed	Never	1,391	49.0%	
	Once a month	413	14.5%	
	Twice a month	273	9.6%	
	Once a week	325	11.4%	
	More than once a week	437	15.4%	
	Total	2,839	100.0%	2.30
Digital studio and media production lab	Never	1,465	51.5%	
	Once a month	631	22.2%	
	Twice a month	289	10.2%	
	Once a week	239	8.4%	
	More than once a week	219	7.7%	
	Total	2,843	100.0%	1.99
Wireless laptops for loan	Never	1,333	46.9%	
	Once a month	406	14.3%	
	Twice a month	312	11.0%	
	Once a week	324	11.4%	
	More than once a week	465	16.4%	
	Total	2,840	100.0%	2.36
Cafe	Never	958	34.0%	
	Once a month	405	14.4%	
	Twice a month	394	14.0%	
	Once a week	497	17.6%	
	More than once a week	565	20.0%	
	Total	2,819	100.0%	2.75

The above table indicates that respondents' top choice for use of expanded library space is "silent study areas" and their least preferred use is "digital studio and media production lab."

Summary

Some of the more important or interesting findings from the survey include:

- Relative to other areas of GE (Integrated), social science courses are oversubscribed by freshmen and sophomores. On the other hand, students appear to wait until their senior year to take science and mathematics GE courses. Whether or not this is an area of concern needs to be explored.
- Congruency between expected course grade (roughly 60 percent of the way into the semester) and actual grade earned is noticeably lower for Area ID course respondents than for other GE Areas. Additional analyses indicated that frequency of instructor feedback is closely related to student ability to correctly anticipate their course grade.
- Respondents in GE Area IB were less likely than their peers in the other GE areas to endorse the notion that their course experience had enhanced their ability to perform cognitive tasks above the recall and comprehension stages of Bloom's Taxonomy of Cognitive Objectives. For the remaining scales (Communications and Priorities), it was clear that respondents did not see communications as being emphasized in IB courses.
- A nested analysis of variance disclosed that student respondents perceive course outcomes, as measured on five broad scales and items, as deriving more from variability of course within GE area than from broad blueprints across GE areas.
- Prediction of final student grade was strongly related to overall grade point average and expected grade (about sixty percent of the way into the course). Other variables such as number of hours worked, ethnicity, gender, and native language explained very little variability. EPT and ELM status as well as admissions basis (native freshman or transfer student) were almost completely unrelated to prediction of final grade.
- Systematic variations in perceived growth for the skills scale and its seven items (Bloom's Taxonomy) as a function of ethnicity, gender, admissions basis, and self-reported effort disclosed that only hours spent per week on the course achieved statistical significance for the analysis of variance model used.
- Some 96.7 percent of respondents indicated that course objectives were clearly stated in the course syllabus.
- A question asking students whether or not they understand the ways in which their course reflects the goals of the General Education program revealed that nearly 30 percent of the respondents were unable to make this connection.

Reference

Nunnally, J.C. Psychometric Theory. New York: McGraw-Hill