College Grades in the Biological Sciences as Related to Secondary School Training

H. F. Thut and E. L. Stover

Eastern Illinois State Teachers College, Charleston, Illinois

For several years we have wondered whether the high school training in the biological sciences had much if any effect upon the grades made by students in our beginning college botany course. In order to substantiate or refute our subjective deductions that they had little effect we decided to make a comparison of grades. A comparison of grades may be a dangerous thing but if viewed in terms of generalities and not specific instances it should show the effect of previous training. To make this comparison we attempted to obtain the actual grade advantage if any for those students who had had some high school training over those having had no such biological experience in high school in their beginning general botany course. Grades for only a year of work or less in botany were considered.

The registrar at our college during the past two years has been placing all the grades of all the students that have been in attendance during these two years on new type record cards. As most of the students who have been in attendance during these years have made their grades within the last five years, we decided to limit our study to these students. Older records are available for former students but we wished to have our data of recent origin. The data we wish to present includes the grades of our present student body through the fall quarter of this school year.

On investigating the records of the registrar we decided to include the grades for zoology and the one-quarter course in hygiene. The number of students considered is 882. Botany and zoology are not required courses except for majors and minors in these fields. Most students are required to elect a one-year course in a laboratory science. These sciences are botany, zoology, physics and chemistry. All students are required to take the one-quarter course in hygiene.

Most of the students considered have taken either a year or less of college botany or a year or less of college zoology. Only a limited number have taken both a year of botany and a year of zoology. Most of the students take their year or less of botany or zoology and their hygiene course the same year.

Conclusions

1. Those students having had high school biology have a slight advantage over the students having had no biology in making college grades. This is true for the students whether they take botany, zoology or hygiene. From the slight differences in the grades one might say that botany is the subject least frequently taught, zoology next, and hygiene most frequently taught in a so called high school biology course.
2. Those students having had ½ year botany and ½ year zoology showed an advantage over the no-biology students in botany, no advantage in zoology and actually did more poorly in hygiene. Their high school training gave them no advantage over the students having had no biology.
3. Those students having had one year of high school botany excel in college botany, college zoology and college hygiene.
4. The number for those having had high school zoology is small and not significant but it indicates too that the students tend to excell in college work.

5. The few students who have had both a year of botany and a year of zoology do superior work in their college courses. Apparently there is considerable transfer of training or information.
6. If these data are an index of conditions, then it is evident that those students who have had one year in a single subject course carry away with them from high school either more available factual material or a superior mental method of approach or both in the biological field.
7. Those students having had high school biology or ½ year of botany and ½ year of zoology have little advantage over those having had no biology. Apparently they retain from their high school training only a small amount of factual material or a poor mental method in biology or both.
8. Training for a year in high school in a one-subject course gives the student a better approach to further work in the same or related biological subjects in college, than a year of work in high school that attempts to cover the whole biological field.

The table below shows concisely the data considered.

COLLEGE GRADES IN THE BIOLOGICAL SCIENCES AS RELATED TO SECONDARY SCHOOL TRAINING

High school training	High school grade	Grade first college course taken	College grades first year or less	Difference between H. S. and college grades	Students considered	Per cent of college grades A's and B's	Per cent of college grades D's and F's	Average of raw psychological score
FOR STUDENTS TAKING BOTANY								
1. Biology 1 year	2.07	1.09	1.10	—.97	122	38	26	153.0
2. No biology		.96	1.03		150	34.2	31	163
3. ½ year botany	1.87	1.14	1.14	—.73	125	36.2	26	153.6
½ year zoology								
4. Botany 1 year	1.68	1.54	1.52	—.16	44	52.7	16	175
5. Zoology 1 year	2.14	1.00	1.13	—1.01	7	31.2	31	186
6. Two years:								
1 year botany	2.12	2.62	2.47	—.35	8	94	0	150
1 year zoology								
FOR STUDENTS TAKING ZOOLOGY								
1. Biology 1 year	2.00	1.39	1.44	—.56	102	45.5	12	146.4
2. No biology		1.44	1.36		106	46.5	17	167.7
3. ½ year botany	1.71	1.30	1.35	—.36	109	45.6	18	157.7
½ year zoology								
4. Botany 1 year	1.57	1.74	1.53	—.04	35	49.3	8	162
5. Zoology 1 year	2.50	2.00	2.25	—.25	2	75	0	209
6. Two years:								
1 year botany	2.50	2.00	2.28	—.22	6	92	0	151
1 year zoology								
FOR STUDENTS TAKING HYGIENE								
1. Biology 1 year	1.92	1.34		—.58	185	43.8	15	155
2. No biology		1.24			226	37.6	18	169
3. ½ year botany	1.81	1.17		—.64	189	37.6	21	161
½ year zoology								
4. Botany 1 year	1.57	1.47		—.10	75	48	11	164
5. Zoology 1 year	1.57	1.71		—.14	14	64	0	175
6. Two years:								
1 year botany	2.37	2.00		—.37	8	88	12	150
1 year zoology								

NOTE.—Grade points given on basis of A=3, B=2, C=1, D=0, and F=—1. Students considered 882. 26.5% had H. S. Biology, 31.5% had NO Biology, 27% had ½ year Botany and ½ year Zoology, 11.4% had H. S. Botany, 1.8% had H. S. Zoology and 1.8% had both (1 year of Botany and 1 year of Zoology). Grades from the Eastern Illinois State Teachers College, Charleston, Illinois.