Individual Student Projects in Embryology

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Because of a sudden unexpected increase in class size in our embryology classes some years past we found our equipment and supplies inadequate. Other exigencies made funds for expansion unavailable. We were therefore, faced with the problem of utilizing improvised visual aids and other materials to supplement our meager supply of slides, models, charts and specimens. We presented the problem to the class and suggested that each student prepare some sort of a project which could be used as a teaching instrument and which would be a contribution of that student to the department and class.

This project could take the form of a chart, a model, mounted specimens, microscopic slides, photographs, strip films, lantern slides or special reports. Materials available in the department could be used and expense to the individual student was to be held to a minimum. Cooperative or team projects were permissible. Students would neither pass nor fail on the basis of the quality of the project or even failure to present one. However, they would be graded on the basis of the contribution of the project to the course and to the individual presenting it.

The results were so gratifying that on the suggestion of the students the idea was used in subsequent classes until now it is accepted as a feature of the course. Benefits which accrue to the student are:

1. He feels that he is making a contribution to the course over and above the meeting of class assignments. The course becomes partly his. His chart, model or slides are being used by other students.

2. He must organize and develop a project in which some concept of embryology is involved.

3. He frequently works on that phase of embryology which is most confusing to him and which he understands least. In explaining or presenting it to others he must understand it himself.

4. He may develop a research interest in some problem which will be investigated more thoroughly later.

The department also benefits greatly. Students become enthusiastic about their projects and thus stimulate ideas in other areas. Many unique and frequently quite valuable teaching aids are created and become available for use in this and other courses. We have accumulated several outstanding charts and models as well as many specimens and slides.

Because we feel that such a program is beneficial to both course and student we recommend that other instructors try it in their courses.

The following projects were among those submitted last year:

1. A series of chick embryos were fixed in the shell and then the shells were removed so that embryos can be observed in situ.

2. Rabbit embryos were removed by caesarian operation from one horn of the uterus and the other embryos in the litter were allowed to develop so that comparative stages were obtained.

3. Several series of comparative stages in the development of different animals were secured by collecting pregnant females at different times during the breeding seasons.

4. Models of different embryos were developed. These were made of clay but *papier mache* and other materials could be used.

5. One complete specimen mounted in serial sections was made available for a class of 30 by micro-photographing sections on 35 mm. film. Thus all could use the serial at the same time.

6. Charts showing the activities involved in gastrulation for several different animals were developed.

7. Excellent reports were presented on fertilization, embryonic circulation etc.

The only catch is that the students will work the instructor and if he doesn't watch out they will keep him busy providing ideas, materials, references and advice. But, after all, isn't that education?