

INFORMATION INTERMIX:  
A TEACHING-LEARNING STRATEGY FOR  
THE BIOLOGY CLASS

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SUMMARY

Information intermix, a student-centered teaching approach designed for the acquisition of academic content without denying the social and emotional elements of students, was used with four groups of 24-27 high school biology students. Questionnaire responses indicated that a statistically significant majority of the students favored the approach.

INTRODUCTION

In recent years high school biology instruction has changed markedly in the areas of content, up-to-dateness and relevance. In the past most biology teachers taught a large group using lectures and demonstrations with very little active participation on the part of the students. The BSCS program gave teachers up-to-date and well written texts accompanied by laboratory exercises that call for maximum student participation. Today the teacher often uses large group instruction for lecture-discussion. Since many biology teachers feel that student participation in the learning process is still largely passive when the student is not in the laboratory, a greater emphasis is being placed on student-centered classroom activities.

Since academic content is still being passed from teacher to student in today's biology classroom, many teaching methods which involve the student in his own learning process are being explored. One such approach which uses the student as both teacher and student is described in this paper.

Rapp and Williams (1971) described an innovative teaching-learning technique, INFORMATION INTERMIX (IM), for academic content integration. The approach is based upon the theory that large groups are distinct entities, just as small groups are inherently different from dyads. Rapp and Williams (1970) pointed to the work of Gibb (1970), Gibb and Gibb (1969), and Schutz (1967, 1970) which indicate that large groups can be therapeutically handled for healthful growth of all participants. Polster (1969) has suggested that large groups can be directed toward the acquisition of a particular theme.

The IM, then, is an approach that joins Gibb (1970) and Schultz (1967, 1970) (personal growth in a large group context) with Polster (1969) (theme orientation in large groups). The approach is designed for the express purpose of the optimum acquisition of academic content without denying the social, emotional, and physical elements of human students.

The format of the session is presented in Figure 1. During the "introduction" the counselor talked with the group and asked them to pay careful attention to the directions which would be given. It was suggested to the group that members simply experience the session and to try not to make value judgements about the session until the "growth group" experiences or the summation.

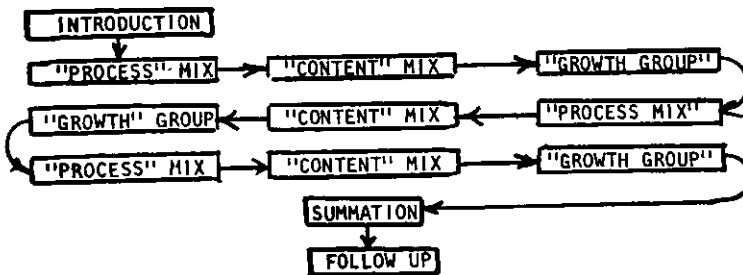
They were then given the following explanations of the various group mixes:

"Information mix:" during information mixes individuals will be grouped by the leader and asked to share their concept with the other members of the group. The group will determine the order of presentation.

"Process" mixes: during process mixes the counselor will provide individuals with an exercise designed to build trust and foster communication.

"Growth group:" for growth group experiences the counselor will place individuals into fixed groups to share feelings, perceptions and observations of the session. This group will meet twice during the session and will be the only group experience in which the membership will be fixed.

Figure 1  
Sequencing of Mixes



Rapp and Williams (1971) drew data from four IM sessions, with an overall total of 605 undergraduate student participants. Subjective written evaluations made by the participants were carefully scrutinized and indicated that the experience was a most acceptable teaching-learning method for this college group. Students also rated the IM experience on a 1-5 scale on the following seven continua: (1) not personally involving--personally involving, (2) not meaningful--meaningful, (3) distant--close, (4) not personal--personal, (5) unorganized--organized, (6) not instructional--instructional, and (7) silly--sane.

Responses were positively and uniformly high for all seven comparisons. Very few participants reported negative feelings and self-report data from these individuals indicated a willingness to participate in subsequent IM sessions. Students, in general indicated a desire to experience IM sessions in other academic disciplines, and when asked to entitle the experience, responses expressed great creative breadth and more than 99% positive.

Rapp and Williams (1971) concluded that the IM, as a college level academic teaching format, is most suitable for further refinement and evaluation. The writers of this paper felt a need to examine this strategy for its appropriateness in working with high school students.

#### METHOD

Students who participated in this investigation were high school students in grades 9-11, at the Developmental Research School, Fla. State University. Four groups of 24-27 students each met for one 50-minute session. The counselor and the biology teacher were present for each session. The students were a mixed group in terms of race, sex, age, ability, and socio-economic status.

The role of the counselor in working with the group was to give directions which would help individuals execute various "mixes" in the most expedient fashion. The biology instructor followed directions with the rest of the class and assumed responsibility as a teacher-learner in addition to assuming sole responsibility for deciding upon the content of the session which pertained to biological concepts.

Following the introduction, content material was distributed to each member of the group. Each person received one 3 x 5 index card. One or two sentences were written on each card which presented a unique concept. A number-letter combination was placed in the upper left hand corner. The group was instructed that this number-letter combination would be the key to forming the groups during the session. When each person had received their content card the counselor began the first, in the sequence of mixes, as outlined in Figure 1.

Direction: Each of you has a content card with a number-letter combination in the upper left hand corner (A<sub>1</sub> A<sub>2</sub> A<sub>3</sub> B<sub>1</sub> etc. ). Please walk around the room and search out 3 other individuals who have a different letter and a different number and form a group of four somewhere in the room. When you have formed your group, please sit quietly and wait for directions.

The rest of the mixes were executed by using similar directions. Number-letter combination given in the directions were varied to help individuals interact with as many other individuals as possible within the intermix session.

Following the nine mixes the entire group formed one large circle and the counselor invited reactions from the participants. Two days later, a 40 minute follow-up discussion was initiated by the counselor to elaborate upon the reactions of the participants. Two weeks after the follow up, students completed a questionnaire about the intermix session to generate information about the appropriateness of this technique. The results of the questionnaire are presented in the following section.

## RESULTS

Table 1 presents a chi square analysis of the questionnaire responses for all four IM sessions. The seven items in Table 1 were based upon the seven bipolar adjective scales used by Rapp et al (1971). The Ss rated the seven adjective statements based upon a five-point scale. The expected frequency in each cell is 16.8 based upon a rectangular population.

TABLE 1

Chi Square Analysis of the Frequency of Responses  
on Seven Adjective Statements  
N-84

Item	Response					X <sup>2</sup>	P
	1	2	3	4	5		
	Strongly Agree	Agree	Ambivalent	Disagree	Strongly Disagree		
The session was							
1. Personally involving	14	44	20	6	0	68.61	.001
2. Meaningful	7	48	17	11	0	79.81	.001
3. Close	9	32	23	17	2	32.14	.001
4. Personal	9	45	20	9	1	68.98	.001
5. Organized	11	46	8	17	2	67.93	.001
6. Instructional	5	46	24	8	1	80.06	.001
7. Sane	14	39	22	8	0	50.92	.001

Table 2 presents an X<sup>2</sup> analysis of data concerning the Ss desire to have this technique (1) repeated in biology class and (2) repeated in other subject areas. They responded on the same 5 point scale.

These cumulative data seem to indicate that this method is seen as acceptable by a majority of students although their reactions were not as overwhelmingly positive as the university group. Reactions on the seven bi-polar scales were positive; several students, however, indicated ambivalent feelings and some indicated negative feelings toward the sessions. Participants' willingness to participate in another session was high as was their reaction to the possibility of experiencing IM in other academic disciplines. There was, however, a relatively large minority who were either ambivalent or had some reservations about participating in subsequent sessions.

From this initial investigation there appears to be evidence that this method as a high school academic teaching format might be suitable for further refinement and evaluation.

TABLE 2  
Chi Square Analysis of Frequency of Responses  
to Repetition Questions

Item	Response					X <sup>2</sup>	P
	1	2	3	4	5		
	Strongly Agree	Agree	Ambivalent	Disagree	Strongly Disagree		
I would like the session							
1. Repeated	24	33	15	17	5	29.1	.001
2. Repeated in other class	19	23	25	13	4	17.19	.01

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