Conceptual Level and Program Openness: Some Data on Matching Models

D. I. Allen
simon fraser university

Après avoir regroupé élèves et enseignants en fonction de leur niveau de conceptualisation, on étudie les conséquences de ce regroupement sur les attitudes des élèves et sur le respect qu'ils se portent. Les professeurs de la 7e à la 10e année, enseignant dans des classes traditionnelles ou décloisonnées, ont rempli un questionnaire se rapportant au décloisonnement du programme et à leur niveau de conceptualisation; on a aussi invité leurs élèves à remplir un questionnaire se rapportant à leurs attitudes face à l'école, au respect qu'ils se portent et à leur niveau de conceptualisation.

On a utilisé l'analyse de la variance pour comparer les scores des élèves des deux différents groupes (programme traditionnel, programme décloisonné) par rapport à leurs attitudes et au respect qu'ils se portent.

Les élèves dont le niveau de conceptualisation est peu élevé, ont, peu importe les conditions, les attitudes les moins favorables et un moins grand respect de soi; les élèves qui suivent un programme traditionnel ont des attitudes plus positives et un respect de soi plus grand que les élèves qui suivent un programme décloisonné – ce qui est surtout vrai pour les élèves dont le niveau de conceptualisation est élevé; les attitudes des élèves sont plus positives lorsque leur niveau de conceptualisation correspond à celui du professeur.

Les résultats de l'étude confirment l'hypothèse selon laquelle il est rentable de regrouper élèves et enseignants selon leur niveau de conceptualisation mais nous obligent à nous poser des questions quant aux structures que l'école devrait réserver aux élèves dont le niveau de conceptualisation est élevé.

During the last 10 years there has been a rapid increase in the number of open-area classrooms in Canada and the United States as well as in other parts of the world. In these classrooms interior partitions between teaching stations have been completely or partly removed to provide flexible teaching space for two or more teachers and their students.

This type of architectural openness must be distinguished from program openness, which is the degree to which programs reflect the characteristics of open education. Open education has been discussed by a number of writers (Barth, 1969; Bussis & Chittenden, 1970; Traub et al., 1972) and may be generally described as the programmatic expression of a set of assumptions made by writers on open education about the way children develop and learn. Generally, open programs are characterized by such practices as freedom of movement, extensive student choice, student self-evaluation, and individualization of instruction.

Reasons given for building open-area classrooms frequently include aspects of open education such as freedom of movement, flexible grouping, and individualization of instruction; however, the two do not necessarily go together. Open programs can be offered effectively in either self-contained classrooms or open areas, and in several studies (e.g. Allen, Hamelin, & Nixon, 1976; Traub et al., 1972) the differences in program openness between schools of open and traditional design have been small.

A third variable which seems likely to be important in considering the effects of open programs and open-area facilities on teachers and students is conceptual level. Conceptual level is a personality characteristic relating to both cognitive complexity and maturity. The work of Hunt and others (Harvey, Hunt, & Schroder, 1961; Hunt, 1971; Tuckman & Orefice, 1973; Hunt, Note 1) suggests that the response of some students may be quite different from others in differing educational environments depending on their conceptual level, and that teachers with high conceptual level may be capable of adapting to the needs of students to a much greater extent than teachers with low conceptual level. Hunt (Note 1) argues for matching students with programs according to their conceptual level. According to his theory, students with low conceptual level (high need for structure) are better suited to highly structured approaches to instruction while students with high conceptual level (low need for structure) are either better suited to situations with a low level of structure, or relatively unaffected by variations in structure.

The present study was designed to assess the effects of program openness, type of classroom, and teachers' need for structure on children of differing conceptual level. It was predicted that students who require much structure (low conceptual level) would have more negative attitudes in open programs, in open areas, and when taught by teachers with low need for structure. By contrast, students who require less structure (high conceptual level) would have more positive attitudes in open programs, in open areas, and when taught by teachers with low need for structure.

The study was the third in a series of explorations of relationships between program openness, need for structure, and type of classroom. In the first (Allen, Hamelin, & Nixon, 1976) no difference was found in program openness between open-area and self-contained classrooms, and teachers in self-contained classrooms had higher job satisfaction than those reporting closed programs. In both cases, differences were due to the scores of teachers with low need for structure. The job satisfaction of those with high need for structure was relatively unaffected by variations in type of classroom and program openness.

In the second study (Allen, Note 2) teachers' job satisfaction was again higher among those offering open programs. However, students' attitudes on most sub-scales of the school sentiment index, and their self-esteem, were more positive under conditions where teachers with high need for structure

offered relatively closed programs in self-contained classrooms. Students taught by teachers with low need for structure were relatively unaffected by program openness or type of classroom. The most likely explanation for this differential effect on teachers and students seemed to be that while teachers with low need for structure may find satisfaction in situations which are open, informal, and relaxed, some children may be disturbed and upset by these conditions. Their attitudes might be expected to be more positive when the teachers were more thorough, and structured, and when expectations were clear and precise. It was hoped that an investigation of these relationships for students with differing need for structure would throw additional light on this explanation, and might provide some useful guidance for teachers and administrators with responsibility for assigning pupils to teachers, programs, and classrooms.

METHOD

A sample of 297 students from grades 4 to 7 was selected in five elementary schools which contained both open-area and self-contained classrooms at that grade level. One hundred and forty-one of the students came from open-area classrooms and 156 from self-contained classrooms in the same schools. The students completed the School Sentiment Index Intermediate Level (Instructional Objectives Exchange, 1972), the Self-Appraisal Scale (Davidson & Greenwood, 1967) and the Paragraph Completion test for measuring Conceptual Level (Hunt, Greenwood, Noy, & Watson, Note 3). The School Sentiment Index is an attitude measure which yields the following sub-scales: mode of instruction, interpersonal relationships, authority and control, social structure and climate, peer, and general. The Self-Appraisal Scale is a measure of self-esteem. The Paragraph Completion test is a semi-projective device for measuring conceptual level or learning style.

The teachers in the selected classrooms, 13 in open areas and 8 in self-contained classrooms, completed the Teacher Questionnaire (Walberg & Thomas, 1971), a measure of program openness; and the Paragraph Completion test. Scoring of the Paragraph Completion test was done by Greenwood, one of the developers of the measure, and a research assistant trained by her. Reliability for scores obtained by the two raters was .837.

Children were grouped into three categories on the basis of their scores on the Paragraph Completion test: those with scores of below 1.0, who were considered to have very low conceptual level and to need very much structure; those with scores of 1.0, who were considered to have low conceptual level and to need much structure; and those with scores of above 1.0, who were considered to need some structure.

It should be noted that these divisions differ slightly from those used by Hunt (Note 1). In his research, students with scores of 0 to 1.0 were defined as needing much structure, those with 1.1 to 1.4 as needing some

structure, those with 1.5 to 1.9 as needing less structure, and those with over 2.0 as needing little structure. The major effect of the procedure used in the present study was to divide Hunt's lowest category into two sections. In addition, the very small number of students with scores of above 1.5 were included with the group defined as needing some structure.

The programs offered in the open-area classrooms were integrated in such a way that it was not possible to associate children with any one of the team of teachers working in their classroom. Because of this the scores of teachers in each open area were combined and a mean score for each of the six open-area classrooms was used in analysis. Teachers were grouped into two categories on the basis of their scores on the Paragraph Completion test: those with scores of 1.0 to 1.9, who were considered to have moderately low conceptual level and to need some structure; and those with scores of 2.0 to 2.9, who were considered to have high conceptual level and to need little structure. One-way analysis of variance was used to test the significance of differences in scores on the School Sentiment Index and the Self-Appraisal Scale for children of different conceptual levels in open-area and self-contained classrooms, in open and closed programs (the upper and lower halves of scores on the Teacher Questionnaire), taught by teachers of different conceptual levels. Differences were accepted as significant at the .05 confidence level. When significant differences were found, additional comparisons were made among the groups using the LSD procedure for multiple-range tests (Kirk, 1968) to determine which combinations of variables resulted in significant differences in attitude or self-esteem.

RESULTS

Mean scores for groups of children of different need for structure in open-area and self-contained classrooms are shown in table 1. Significant differences were found between the groups on the total School Sentiment Index and on three of the sub-scales. However, in each case the differences were due to the low scores of children who need very much structure, and not to type of classroom. The scores of children in open-area classrooms were often lower than those of children in self-contained classrooms, but in no case was this difference significant. It was concluded that type of classroom did not affect attitude towards school or self-esteem for children at any level of need for structure.

Mean scores for groups of children of differing need for structure in closed and open programs are shown in table 2. Significant differences were found between the groups on the total School Sentiment Index, on the Self-Appraisal Scale, and on the sub-scales for Interpersonal Relationships, Authority and Control, Learning, and General. As in the previous comparison, the scores of children who need very much structure were substantially lower than those who need much or some structure on a

Table 1 / Mean Scores on the School Sentiment Index and the Self-Appraisal Scale for Children of Differing Need for Structure in Open-Area and Self-Contained Classrooms

	Open-Area Classrooms			Self-Contained Classrooms			
	Need very much structure ($N = 36$)	Need much structure ($N = 79$)	Need some structure ($N = 26$)	Need very much structure ($N = 44$)	Need much structure ($N = 78$)	Need some structure ($N = 34$)	F
Mode of Instruction	9.23	9.92	9.56	9.21	10.33	9.80	0.70
Interpersonal Relationships	8.31	9.76	9.17	8.87	10.04	9.13	3.14*
Authority and Control	7.76	8.52	8.78	7.45	9.59	9.53	1.90
Learning	6.49	8.23	7.22	6.29	7.37	6.73	1.48
Social Structure and Climate	7.13	8.01	7.94	7.89	8.68	8.47	2.64*
Peer	8.46	9.33	9.28	8.37	9.66	10.13	3.97*
General	7.54	8.92	9.11	7.18	9.74	9.13	3.97*
Total School Sentiment Index	54.82	62.70	61.10	55.26	65.41	62.93	3.21*
Self-Appraisal Scale	56.33	56.74	61.28	57.08	58.44	57.53	2.15

$p < .05$

Table 2 / Mean Scores on the School Sentiment Index and the Self-Appraisal Scale for Children of Differing Need for Structure in Open and Closed Programs

	Closed Programs			Open Programs			
	Need very much structure ($N = 45$)	Need much structure ($N = 80$)	Need some structure ($N = 34$)	Need very much structure ($N = 35$)	Need much structure ($N = 77$)	Need some structure ($N = 26$)	F
Mode of Instruction	9.33	9.94	9.67	9.10	9.92	9.70	0.47
Interpersonal Relationships	8.90	10.55	10.00	8.10	9.01	7.60	5.02*
Authority and Control	7.48	8.77	9.52	7.40	9.24	8.60	3.93*
Learning	6.28	8.51	7.81	6.37	7.06	5.80	3.21
Social Structure and Climate	7.95	7.72	8.33	7.00	8.58	8.30	1.95
Peer	8.80	9.73	9.76	7.97	9.10	9.90	2.09
General	7.35	9.94	9.67	7.03	8.46	8.30	4.03*
Total School Sentiment Index	56.08	65.15	64.76	52.97	61.36	58.20	3.53*
Self-Appraisal Scale	56.80	58.24	60.90	55.93	56.86	57.00	3.67*

$p < .05$

number of the scales, but there were also some significant interactions with program openness. There were significant differences between the scores of children in open and closed programs on the total School Sentiment Index and on sub-scales for Interpersonal Relations, Learning, and General. In each case the scores of those needing very much structure were very close in both open and closed programs. The scores of those who need much or some structure were significantly lower in open programs on sub-scales for Interpersonal Relationships, Learning, General, and for the total School Sentiment Index; and the scores on the Self-Appraisal Scale of those who need some structure were lower in open than in closed programs. The difference in total School Sentiment Index scores for those who need very much structure was not significant.

The pattern of scores on the total School Sentiment Index and on the sub-scales for Interpersonal Relationships and Learning is particularly interesting. In each case the scores for those who need much structure were higher than for those who need very much structure. However, while the scores of those who need some structure remained about the same in closed programs, in open programs they dropped sharply. This result was unexpected and seems to run counter to Hunt's analysis of learning styles. It would be anticipated from his work that children who need some structure would be better suited to open programs, or at least be capable of adapting easily to open or closed classroom environments.

Mean scores for groups of children of differing need for structure taught by teachers with differing need for structure are shown in table 3. Significant differences were found between the groups on the Self-Appraisal Scale, on the total School Sentiment Index, and on the sub-scales for Interpersonal Relationships, Authority and Control, Learning, Peers, and General. As in both previous comparisons the scores of children who need very much structure were low. The difference between the groups on the Self-Appraisal scale was due to variations among children taught by teachers needing some structure. There was a relatively high mean score for children who need some structure and a low score for children who need very much structure, when taught by teachers needing some structure.

The scores of children on the School Sentiment Index followed a pattern which supported the idea of matching students and teachers with similar need for structure. For teachers needing some structure the group of students with the most positive attitudes (reflected on every sub-scale and on the total School Sentiment Index) were students needing much structure. For teachers needing little structure the most positive attitudes (also reflected on each sub-scale and the total score) were held by students needing some structure. The differences were significant on five of the seven sub-scales, and the trend was maintained on the other two.

Scores on the Self-Appraisal scale did not follow the same pattern. The differences on that measure were due to the relatively low scores of those

Table 3 / Mean Scores on the School Sentiment Index and the Self-Appraisal Scale for Children of Differing Need for Structure Taught by Teachers with Differing Need for Structure

	Teachers Needing Some Structure			Teachers Needing Little Structure			
	Need very much structure ($N = 34$)	Need much structure ($N = 65$)	Need some structure ($N = 36$)	Need very much structure ($N = 56$)	Need much structure ($N = 92$)	Need some structure ($N = 24$)	F
Mode of Instruction	9.37	10.20	9.50	9.18	9.74	10.11	0.89
Interpersonal Relationships	8.68	10.53	8.55	8.51	9.33	10.89	2.81*
Authority and Control	7.01	9.18	8.73	7.59	8.87	10.44	3.18*
Learning	6.32	9.02	7.05	6.31	7.01	7.44	2.68
Social Structure and Climate	7.42	8.40	8.18	7.59	7.96	8.67	0.53
Peer	8.89	9.92	9.73	8.27	9.10	10.00	2.70*
General	7.63	9.70	8.95	7.06	8.91	9.89	3.40*
Total School Sentiment Index	55.37	66.95	60.68	54.51	60.92	67.44	3.24*
Self-Appraisal Scale	55.37	57.50	60.32	56.82	57.63	58.00	2.76*

$p < .05$

needing very much structure and not to differences in teachers' need for structure.

DISCUSSION

Several general conclusions can be drawn from the results of this study.
(*a*) Children who need very much structure (low conceptual level) tend to have more negative attitudes towards a number of aspects of school and lower self-esteem under all combinations of program openness, classroom type, and teachers' need for structure.
(*b*) Type of classroom does not appear to have any significant direct effect on attitude to school or self-esteem, regardless of students' conceptual level. It should be noted, however, that in a previous study (Allen, Note 2) classroom type did have an interactive effect on students' attitudes when related to program openness and teachers' need for structure. In this study the sample size was too small to permit another analysis of those interactions.
(*c*) Children's attitudes are generally more positive in closed than in open programs regardless of their need for structure. The fact that this effect was particularly strong for children with relatively high conceptual level (who need some structure) was puzzling and warrants further investigation.
(*d*) Students' attitudes toward school tend to be more positive when students and teachers are matched on the basis of need for structure. The consistency of this pattern in the results provides strong support for the idea of matching students with teachers.

The fact that matching students with programs did not result in more positive attitudes for students with relatively high conceptual level remains puzzling, particularly in view of the fact that previous work on conceptual levels has emphasized matching students with programs rather than with teachers.

One speculative interpretation is that children with relatively high conceptual level, who tend to be more creative and independent than others, may behave in unanticipated ways in open programs, break informal and unstated rules, and run into sanctions imposed by teachers and other students. This could result in less favorable attitudes towards various aspects of schooling, and would probably be most noticeable in situations where program openness was associated with some ambiguity in procedural rules and confusion among students.

The sample of teachers and students involved in this study was small, was drawn from only one school district, and subjects were not randomly assigned to treatment conditions. Therefore, considerable caution must be exercised in generalizing from the results. On the other hand the findings provide sufficiently strong evidence of interactions between the educational environment as measured by the Teacher Questionnaire and the conceptual levels of teachers and students to justify more extensive research in the

area, and consideration of these variables in assigning students to teachers and programs.

REFERENCE NOTES

1. Hunt, D. E. Teachers' adaptation to students: From implicit to explicit matching. Toronto: Ontario Institute for Studies in Education, Department of Applied Psychology, 1974.

2. Allen, D. I. *Some effects of program openness, classroom type and teachers' need for structure on children's attitude and self-esteem.* Simon Fraser University, 1976. (Mimeographed.)

3. Hunt, D. E.; Greenwood, J.; Noy, J. E.; & Watson, N. Assessment of conceptual level: Paragraph completion method. Toronto: Ontario Institute for Studies in Education, Department of Applied Psychology, 1973.

REFERENCES

Allen, D. I.; Hamelin, R.; & Nixon, G. Need for structure, program openness and job satisfaction among teachers in open area and self-contained classrooms. *The Alberta Journal of Educational Research*, 1976, *22*(2), 149–153.

Barth, R. S. Open education assumptions about learning. *Educational Philosophy and Theory*, 1969, *1*(2), 29–39.

Bussis, A. M., & Chittenden, E. A. *Analysis of an approach to open education.* Project Report. PR-70-13. Princeton, N.J. Educational Testing Service, 1970.

Davidson, H. H., & Greenwood, J. W. *School achievers from a deprived background.* USOE Project No. 2805, Contract No. OE-5-10-132. New York: The City College of the City University of New York, 1967.

Harvey, O. J.; Hunt, D. E.; & Schroder, H. M., *Conceptual Systems and Personality Organization.* New York: Wiley, 1961.

Hunt, D. E. *Matching models in education: The coordination of teaching methods with student characteristics.* Monograph series no. 10. Toronto: Ontario Institute for Studies in Education, 1971.

Instructional Objectives Exchange. *Attitude toward school K-12.* Los Angeles: Instructional Objectives Exchange, 1972.

Kirk, R. *Experimental design: Procedures for the behavioral sciences.* Belmont, Calif.: Brooks, 1968.

Traub, R. E.; Weiss, J.; Fisher, C. W.; & Musella, D. Closure on openness: Describing and quantifying open education. *Interchange*, 1972, *3*(2-3), 69–83.

Tuckman, B. W., & Orefice, D. S. Personality structure, instructional outcomes and instructional preferences. *Interchange*, 1972, *3*(2), 43–48.

Walberg, H. J., & Thomas, Susan C. *Characteristics of open education: Towards an operational definition.* Newton, Mass.: TDR Associates, Inc., Contract No. DEC-1-71-062805-3936, 1971.

D. Ian Allen is Associate Professor of Education at Simon Fraser University, Burnaby, British Columbia, V5A 1S6.