DOCUMENT RESUME

ED 353 928 HE 026 189

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TITLE Conceptual Level Development in Higher Ability College Students.
PUB DATE 90
NOTE 13p.; Paper presented at the Annual Meeting of the Mid-Western Educational Research Association (Chicago, IL, October 1990).
PUB TYPE Reports - Research/Technical (143) -- Speeches/Conference Papers (150)

EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS Cognitive Style; *College Freshmen; College Instruction; *College Seniors; Educational Environment; Higher Education; Honors Curriculum; Independent Study; *Learning Strategies; Maturity (Individuals); *Student Attitudes; *Student Development; Teaching Methods
IDENTIFIERS *Conceptual Level; *Miami University OH

ABSTRACT

This study investigated the amount of structure preferred by college students in a learning environment and evaluated responses using a notion of conceptual level. The theory of conceptual level suggests that students at higher conceptual levels prefer more independence and less structure in learning while students at lower conceptual levels prefer to learn with more structure and instructor control. Subjects of the study were first year and senior Honors Program students at Miami University (Ohio) who responded to the Course Learning Activities Questionnaire developed to measure preference for college level teaching methods such as lecture, discussion, independent study, case studies, and teaching. Comparisons between the two groups were made using t-tests and discriminate analysis. Findings indicated that first year students preferred learning by the lecture method, learning facts, and taking objective examinations while senior honors students preferred independent study where library resources were used, and critical written evaluations of material research were used to evaluate course outcomes. A discriminate function of 10 items that included items related to preference for lecture and instructor control and independent study and student control of learning was statistically significant in differentiating first year and senior honors students. (Includes 13 references.) (JB)

Conceptual Level Development in High Ability College Students

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Presented at the Annual Meeting of the
Mid-Western Educational Research Association
1990
Chicago, Illinois

Conceptual Level Development in High
Ability College Students

This study investigated the importance of Conceptual Level, developed by Hunt, which is the amount of structure preferred by students in a learning environment. Subjects were first year and senior Honors Program students at Miami University who responded to the Course Learning Activities Questionnaire, developed by the author to measure preference for such college level teaching methods as lecture, discussion, independent study, case studies, and teaching where a variety of methods are used. Comparisons between the two groups were made using t-tests and discriminate analysis. The results support Hunt's theory where students at higher conceptual levels prefer more independence and less structure in learning while students at lower conceptual levels prefer to learn by more structure and instructor control. T-tests found two scales significantly differentiated the two groups where first year honors students preferred learning by the lecture methods, learning facts and taking objective examinations while senior honors students preferred independent study where library resources are used, and critical written evaluations of material researched are used to examine course outcomes. A discriminate function of only ten items that included items related to preference for lecture and instructor control and independent study and student control of their learning was statistically significant in differentiating first year and senior honor students. The discriminate function properly classified 72.9 percent of the first year students and 66.7 percent of the seniors. These findings support the theoretical work of Hunt and Perry where students at higher conceptual levels prefer more independence and are capable of adapting to complex learning environments while students with lower conceptual levels are more dependent on instructors where facts are presented as the last word and tests are objective.

The purpose of this research was to determine how the theoretical construct, Conceptual Level (Hunt, 1975, 1979) expresses itself in intellectually gifted college students participating in an honors program. Conceptual Level is the amount of structure or organization a student needs in the learning environment to learn best. In high structure, the environment is largely determined by the teacher and the student has little responsibility, while in low structure the student is much more responsible for organizing the environment. Hunt believes it is the amount of complexity in the learning environment that determines growth from dependence to greater self responsibility and increased capacity for considering alternative answers. In this study structure in the learning environment is defined as a student's preference for specific educational goals and the corresponding teaching methods and evaluation methods that are associated with those specific goals.

Much of Hunt's work has been done with elementary and high school age students so the use of intellectually gifted college students will provide yet another population to determine if ideas on Conceptual Level, as one form of learning style, has meaning for older, more intellectually complex students.

The relevant research on structuring learning environments and its effect on achievement and attitudes toward courses and instructors is presented using samples of college students, adult learners and adolescents.

Guetzkow, Kelly and McKeachie (1954) studied the effects of three teaching methods, recitation-drill, group-discussion, and tutorial-study on achievement and attitudes toward psychology in a freshman general psychology course. They found no practical differences between the three teaching methods on achievement but the discussion method produced slightly more favorable attitudes toward psychology than drill and tutorial methods. Preference for instructional method was also examined by comparing preference

before and after the course. At the beginning of the course recitation and discussion were equally preferred and tutorial less so. Students in recitation sections showed a statistically significant gain in their preference for this method, while students in discussion and tutorial sections showed no significant changes in preference. Preference for a teaching method and learning under that method had no influence on performance on the final examination.

James (1962) attempted to enhance student achievement in Air Force trainees by comparing student preference for reading or lecture modes. He found two significant interactions--reading produced higher achievement and the reading preference produced greater achievement for higher ability students. But he also found that the highest achievement was earned by trainees who had no instructional preference. The limitations of the study are that no objective measure of preference for instruction was used, the "lecture" was listening to a tape recording, and no attitude measures toward instruction were used.

Domino (1971) studied whether college freshmen taught by methods that were consonant with their achievement needs would achieve higher grades and have more positive attitudes toward the course than unmatched students. Two scales, achievement via independence and achievement via conformity from Gough's California Psychological Inventory measured achievement needs. From an entering Freshman class of 900, the 50 high Ac low Ai and top 50 low Ac high Ai students were identified. Eliminated were those whose SAT score fell below 550 or above 650. These 100 students were assigned to four introductory psychology sections with the same instructor and were equal in sex composition and mean SAT scores, but homogeneous in achievement needs.

One group of high Ac and one group of high Ai students were taught by the lecture method that stressed factual information that paralleled the textbook

and required class attendance. For the high Ai and Ac groups taught in an independent manner, emphasis was placed on ideas rather than facts and active participation by students rather than professor lectures. Students taught in a manner consonant with their achievement orientation obtained significantly higher means on multiple choice final examination items and higher factual knowledge on ratings of essay answers, and gave higher teacher and course evaluations than peers taught in a dissonant manner.

Pascal (1971) examined the educational outcomes of matching undergraduate students' instructional preferences for lecture, lecture and discussion, and independent study in an undergraduate psychology course titled "Socialization." A minimum of fifty students were assigned to each of the three instructional options. About one-half of each group were randomly assigned to the method which they listed as their first option; the other half were randomly assigned to their second or third choice. Students who received their preferred learning method did not earn higher grades or rate the course as more valuable compared to students who did not learn under their first preference. However, students who learned under their preferred method expressed a more positive attitude toward psychology and students who preferred lecture and lecture and discussion performed better on knowledge and comprehension type final examination questions. Students in the lecture-discussion and independent study options did not perform better on the application part of the final examination; however independent reading students scored higher than the other two groups on the evaluation of a novel article. Students assigned to the non-preferred independent study option rated the course more difficult and anxiety provoking than students who preferred this option. Students in the study favored having instructional options (93.5 percent) and 91.6 percent thought options provided them with freedom and individualization. Pascal suggested that more differences were

not found due to the preference factor because of the professor of the lecture option who was well liked. Students commented that her lectures caused some to change their minds as to which option they preferred.

Shaw and Brent (1977) found a significant interaction between preference for structure and course achievement but not course satisfaction using a sample of introductory psychology students. Specifically they found students high in their need for structure but in a low structure class achieved at a lower level than groups that were matched for structure.

Smith (1976) researched teaching method preference by developing a 54-item instrument that measured nine different instructional strategies: (1) projects, (2) drill and recitation, (3) peer teaching, (4) discussion, (5) teaching games, (6) independent study, (7) programmed instruction, (8) lecture, and (9) simulation. She then used the instrument in an experiment with young adolescents who were matched in instruction preference for lecture, discussion and simulation. She found that the teaching method preference correlated .38 with achievement and .23 with motivation. Smith concluded students differ in their preference for teaching modalities and that teaching method matching can significantly enhance educational outcomes.

Methods

Subjects

The target population is the university honors program students at Miami University where admission to the program is determined by meeting one of the three following criteria: graduating in the top five percent of a high school class, earning an ACT composite score of 29 or higher, earning a combined SAT score of 1210, or earning a 3.6 g.p.a. after one semester at Miami. Continuation in the program requires a 3.2 g.p.a. after the freshman year and a 3.4 g.p.a. after the junior year. Subjects were freshmen in their first month on campus and seniors who were completing their last semester of the

four-year honors program. There were 53 seniors who were completing the four-year honors curriculum, and 45 or 83 percent agreed to participate. Three freshmen seminars were selected for study, and all 59 agreed to participate.

Measurement

The Course Learning Activities Questionnaire, developed by the author has 30 Likert type items that measures attitudes of college students toward classroom learning activities that include teaching methods, course goals, and learning activities. The 30 items made up five scales and their Alpha reliability coefficients are: Lecture, .76; Discussion, .74; Independent Learning, .73; Case Studies, .71; and Variety of Teaching Methods, .67.

Data Analysis

T-tests were computed for the five CLA scales between freshmen and seniors and discriminate analysis was used to determine if any items form a linear combination that differentiates the two groups. If a meaningful discriminate function is found, t-tests will be used to compare the two groups. In both uses of the t-test, the .05 level will be used to determine statistical significance.

Results

Two course learning activities, lecture and independent study, were found to significantly differentiate freshmen from senior honors students. No differences were found in preference for discussion, case studies or a variety of teaching methods. Freshmen expressed a significantly greater preference for lecture ($\underline{M}$ - 17.37) than seniors ($\underline{M}$ - 14.75) $\underline{t}$ (102) = 3.05, $\underline{P}$ .003, while seniors expressed a higher preference for independent study ($\underline{M}$ = 17.08) than freshmen (M = 14.88) $\underline{t}$ (102) = -2.84, P = .006.

Discriminate analysis showed a meaningful discriminate function as shown by the Wilks Lambda of .601 which equates to a Chi Square of (44.04, 27, p =

.02) which is highly significant and indicated the freshman mean of -0.689 on the discriminate function is significantly lower than the senior mean of 0.900. The 30-item CLA properly classifies 74.1 percent of the freshmen and 81.8 percent of the seniors. By using correlations of .24 and higher between CLA items and the discriminate function, it was possible to select ten of the 30 items for further analysis. When using only ten items, the Wilks Lambda of 0.770 p .004 is highly significant and indicates the freshman mean of -0.472 is significantly lower than the senior mean of 0.619. This ten item discriminate function properly classifies 72.9 percent of the freshmen and 66.7 percent of the seniors. Because the discriminate function does not tell us on which of the specific variables freshmen and seniors differ, t-tests were computed for each of the ten items to further determine how freshmen and seniors differ in their preference for learning activities. All ten of the variables showed statistical significance at the .05 level or beyond.

Five of the variables that showed a higher preference from freshmen involved professors who lecture and teach factual information that should be recalled and examined by objective tests while the other five items that showed higher preferences from seniors involved learning alone in the library, learning through simulation, and valuing professors who require independent learning.

Discussion

These findings support the conceptual level hypothesis of Hunt (1975) where students at higher conceptual levels are structurally more complex, more capable of independent action, and more capable of adapting to a changing environment than students at a lower conceptual level. They also support the ideas of Perry (1970) where intellectual development in college students is hierarchical and qualitatively different where they change from thinking that all knowledge is certain and can be obtained from authorities to the

recognition that uncertainties exist and that multiple possibilities exist in most areas of knowledge. College students progress to the higher stages where better or worst choices are possible on the basis of evidence available in a certain context. These findings are also consistent with the data from Skipper (1987) where he found two discriminate functions, preference for structured instruction and concern for examinations that differentiated among preservice teachers in their undergraduate program. He found freshmen and sophomores prefer courses that were structured and led by professors where objective tests were administered. By contrast, senior preservice teachers prefer greater freedom and personal responsibility in their activities.

The results are also consistent with Wispe's (1951) findings that students who are more independent prefer permissive teaching methods while insecure students prefer more direct methods. This insecurity hypothesis along with the cognitive development ideas of Perry and Hunt help explain why highly intelligent, highly motivated freshmen in an honors program prefer greater structure. Being in a new environment and a prestigious program that demands a very high grade point average to continue may create insecurity that is reduced by professor dominated classes when factual information is valued for its certainty. This reasoning finds support from Snow (1980) who observed that independent study and student led discussions place the heaviest burden on students to organize and integrate material largely on their own, while lectures place much less personal responsibility for learning.

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Table 1

Preference for Lecture by First Year and Senior Honors Students

First Year			Senior			
N	M	S.D.	N	M	S.D.	T
58	17.36	4.66	45	14.75	3.90	3.01*

* < .00

Table 2

Preference for Discussion by First Year and Senior Honors Students

First Year			Senior			
N	M	S.D.	N	M	S.D.	T
58	23.05	2.81	45	23.62	3.06	0.32 n.s.

Table 3

Preference for Independent Study by First Year and Senior Honors Students

First Year			Senior			
N	M	S.D.	N	M	S.D.	T
58	14.81	3.77	45	17.15	4.14	-2.98*

* < .00

Table 4

Preference for Case Study by First Year and Senior Honors Students

First Year			Senior			
N	M	S.D.	N	M	S.D.	T
58	22.20	3.77	45	22.53	4.27	-0.44 n.s.

Table 5

Preference for Variety of Teaching Methods
by First Year and Senior Honors Students

First Year			Senior			
N	M	S.D.	N	M	S.D.	T
58	19.50	3.51	45	18.33	3.63	1.65 n.s.

Table 6

Correlations of Ten Item Discriminate Function

Item	Correlation
Professor Lectures	-.62
Rank of Professor Who Lectures	-.58
Learning Alone Using Library	.57
Recalled Knowledge as Most Important Goal in Class	-.57
Rank of Course Goal to Develop Independent Learners	.39
Rank of Learning Alone in Library	.39
Rank of Learning What Professor Teaches	-.37
Rank of Professor Who Uses Case Studies	.37
Rank of Professor Who Requires Independent Learning	.35
Rank Course Goal of Learning Knowledge	-.35