Variation In Learning Styles In A Large Class As Influenced By Gender And Academic Discipline

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Abstract

The logistics of teaching large courses dictate that they are primarily taught by the lecture method. Knowledge of student learning styles can help in implementing different teaching strategies. Students in a large general education course (n=524) were asked to complete the Myers-Briggs Type Indicator instrument. The primary learning preference for the course (ENFP) was not compatible to learning by the lecture method. Gender differences exist; females strongly preferred the feeling dimension, while males preferred the thinking. A knowledge of personal and student learning style preferences can help in choosing appropriate teaching strategies and identify potential student problems.

Introduction

Institutions of higher education have witnessed an increase in large class instruction for many academic areas. Associated with this situation are accompanying concerns related to instructional approaches. This article addresses two issues which are important in teaching large lectures. Specifically, the importance of knowing the learning style composition of a large class as an aid to choosing appropriate teaching strategies, and suggest different instructional strategies for reaching students with different learning styles by using an example large class.

The average undergraduate class size has increased steadily in this century, especially since 1970 (Carnegie Foundation, 1986). In the most ideal educational setting there would be no large classes. However, colleges and universities have had to accept the fact that large class enrollments, especially in introductory level courses, are cost-effective. Pressure to increase student enrollment without adding faculty and expanding the curriculum contributes to large classes (Krabill, 1981; Carnegie Foundation, 1986).

The movement toward large classes is not a recent phenomenon. McKeachie (1980) contends that class size was probably the first issue of college teaching to be researched (Edmonson and Mulder, 1924; Hudelson, 1928). However, the research on large class instruction is limited.

Over the years small and large classes have been compared and contrasted with respect to an assortment of variables. McKeachie (1980) summarized the existing literature, and his findings appear not to have been changed or altered by an additional decade of research. He concluded that large classes were not as effective as small classes for retention of knowledge, critical thinking, and attitude change. Benjamin (1991) states: "Although McKeachie's general conclusions are still accurate, at least one study can be cited to cast doubt on each of his claims for the superiority of small size classes."

Many educational theorists contend that increased class size guarantees lower quality instruction. However, we must not believe that "size" alone is the most important determinant of the success of a class. Several researchers contend that large class instruction can be just as effective as small class settings (Marsh et al., 1979: Feldman, 1984; Williams et al., 1985). In fact, there are campuses at major universities where the large-class instructor's student ratings are equal to the ratings of the best small-class instructors (Wulff et al., 1987).

A study at the University of Washington (Wulff et al., 1987) involving 800 students identified students' perceptions of large classes through the use of open-ended questions. Results from the survey suggested that quality of instruction, rather than class size, was important to the students. There was no clear indication that students preferred classes of a certain size. Students felt that the material covered in a large course was more general, had less depth, and was beneficial for introduction to a new subject area compared with a small course. The most effective instructor needed to be competent, caring, friendly, excited, and enthusiastic about the subject area, as well as a good speaker. This study revealed that the one outstanding discrepancy in student ratings between small and large class instruction was the interaction factor. Students identified that there was little opportunity for questions and discussion. This suggests that teaching faculty can improve large class instruction if they can increase the interaction between students and instructor. One starting point for choosing appropriate interaction methods is to determine

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student learning styles or preferences.

A person's learning style is a set of behaviors which indicate or describe how a person learns, adapts to his/her environment, and the process used to organize and process information (Gregorc, 1979; Cano et al., 1992). The Myers-Briggs Type Indicator (MBTI) is an instrument which measures or identifies 16 types or styles of learning (Myers and McCaulley, 1985). It is capable of accounting for most of the traits identified by other widely used instruments (Lawrence, 1984). For identifying learning styles, the MBTI is considered to be the most reliable and valid instrument of its kind, (Bonham, 1988a; Bonham, 1988b; Tischler, 1994).

The MBTI characterizes personality types by a combination of four dimensions, with a total of 16 possible combinations (types). The four dimensions characterize a person's preference, on a continuum between two extremes, for each of four pairs: Extroversion (E)/Introversion (I), Sensing (S)/Intuitive (N), Thinking (T)/Feeling (F) and Judging (J)/Perceiving (P) (Lawrence, 1984; Myers and McCaulley, 1985; Provost and Anchors, 1987). The "E" and "I" refer to the manner in which a person is energized. The "S" and "N" indicates a perceptive process, the process in which a person prefers to receive information. The "T" and "F" function identifies a judging process, the manner in which a person makes a decision. The "J" and "P" indicates preferences related to the manner in which individuals prefer to live their lives. The combination of each of the four dimensions gives a person their "learning preference".

The objectives of this study were to identify the type make-up of a large general education science course; to identify if similarities exist in types among academic disciplines and between genders; and to identify teaching strategies which can be implemented in large classes. The rationale is that students learn differently and not all process information in the same manner (Cano et al., 1992). Instructors must be sensitive to the issue that many types of learning styles exist in a class and that they must implement different teaching strategies to accomodate these styles.

Data Collection Procedures

In the spring of 1994, undergraduate students at the University of New Hampshire enrolled in a large, General Education, nutrition course designed for non-science majors were asked to complete the MBTI Form G Self-Scorable instrument. The MBTI was distributed during laboratory breakout periods and completed during that time. Of the 524 instruments distributed, 100% were returned. The survey population consisted of 327 (62%) females and 197 males. Six colleges at the university were represented in this study, although more students were in the College of Liberal Arts. Students were primarily freshmen with some representation from all other class ranks.

Results and Conclusions

Figure 1 and Table 1 list the results of the different MBTI type preferences for the class. Figure 1 gives the breakdown by each of the 4 different dimensions by gender and Table 1 lists each of the 16 different type preferences, also by gender. As a class, "E" (64%) predominated over "I"; especially for females. There were slightly more "N" (53%) than "S" and males and females were about equally split between the two. Feeling (F) types dominated (66%) over "T" primarily because of the large number of females in the class. Females were predominantly "F" (82%), while males were predominantly "T" (59%). Males preferred the "P" type (65% of males), while females were split between "J" and "P". All 16 different MBTI types were found in the class; however, there was not an equal distribution in terms of learning preference alone or grouped by gender. The composite preference for the class was ENFP. About 51% of the females could be grouped into 3 types: ENFP, ESFJ, and ENFJ. Of the males, 39% could be grouped into ENFP, ENTP, or ESTJ groups.

Table 2 lists the average "strength" of each of the 4 dimensions for each of the major colleges, by gender. The value is calculated by taking the individual difference between the score of each pair of dimensions, then averaging them by gender within college. The greater the positive number, the greater the preference for the "E", "S", "T", "J". The greater the negative number, the greater the preference for "I", "N", "F", or "P". A score near zero signifies equal preference between the two extremes for each dimension. All colleges showed the same trend for the "E"/"I" dimension in terms of females showing strong preference for "E" and males closer to equal preference, though still on the "E" side. The "S"/"N" dimension showed a great deal of variability between college and by gender with some of the greatest differences between gender found in the Whittemore School of Business and Economics and the College of Health and Human Services. The "T"/"F" dimension showed the greatest differences between gender and little difference due to college. Females strongly preferred the "F" dimension, while males preferred the "T" dimension. There was some variability between colleges and gender in the "J"/"P" dimension, though, the general preference was toward the "P" preference.

A typical large class is usually taught using the lecture format, a style which is useful for conveying large amounts of factual information rapidly. Using the composite learning preference for our class, the question is, "Is the lecture a preferred method for teaching this class?"

The composite preference for our class was ENFP. An "E" or extrovert student prefers to learn by talking and interacting in group situations. An "N" or intuitive student

prefers to work with possibilities or "what if..." scenarios. An "F" or feeling student prefers to make a decision by use of personal values and takes into account the effects of a decision on other people, even if the decision goes contrary to established facts. These people need positive feedback. A "P" or perceptive student prefers a carefree, adaptable type of environment. They do things at the last minute, and tend to procrastinate. For a discussion on student learning preferences and teaching activities, see the following references (Lawrence, 1984; Myers and McCaulley, 1985).

In a typical large class that is lecture-based, without a variety of teaching techniques, ENFP students will be uncomfortable because of little talking or group interactions, usually the material is factual based, relies on logical analysis, and probably is highly structured and organized. Feedback is usually limited, which is difficult for "F" students. It doesn't mean they can't do as well, it just means it will be harder. If they become frustrated, they can become antagonistic or super critical of the course and instructor. An ISTJ student will probably do well and be comfortable in a lecture-based environment. In our class they comprise only 7% of the class, leaving a large portion of the class who might need differing degrees of alternative teaching activities.

It is also of interest that the predominant learning style of the class was the same as the instructor's (ENFP). We feel that this may partially account for the high student evaluation scores of 5, out of a possible 5, for overall rating of the instructor. We also feel that instructors whose learning style is opposite from that of the majority of students may meet with resentment and some friction if the needs of the student are not met either through a variety of teaching techniques or if students do not realize how differences in style can affect teaching (Cooper and Miller, 1991; Erickson and Strommer, 1991). Many conflicts could be resolved by adding a variety of teaching techniques to the class (Cooper and Miller, 1991; Erickson and Strommer, 1991). Students with the same learning style as the instructor seem to have a better chance of being successful in the course (Nisbet et al., 1982). Administrators may need to consider learning preferences in putting instructors with certain large, introductory courses where students don't seem to be as flexible in handling different teaching styles (Cooper and Miller, 1991).

One aspect of the MBTI that is noticeably absent

Table 1. Number of students in each MBTI preference expressed as percentage of total class.

	ISTJ	ISFJ	INFJ	INTJ
Male	8.8	2.8	2.3	2.8
Female	5.2	7.8	4.2	0.7
All	6.7	5.7	3.4	1.5
	ISTP	**ISFP**	**INFP**	**INTP**
Male	5.6	2.3	8.3	7.9
Female	0.3	5.5	7.5	2.0
All	2.5	4.2	7.8	4.4
	ESTP	**ESFP**	**ENFP**	**ENTP**
Male	8.3	3.7	16.2	13.0
Female	2.6	6.8	22.5	1.3
All	5.0	5.5	19.9	6.1
	ESTJ	**ESFJ**	**ENFJ**	**ENTJ**
Male	9.7	3.2	2.3	2.8
Female	3.6	16.6	11.4	2.0
All	6.1	11.1	7.6	2.3

Table 2. Strength of preference for each of the four MBTI dimensions expressed as the average difference between the two extreme values for each pair by gender and college. A positive number indicates a preference for the first of the paired letters; a negative a preference for the second of the paired letters. Letters in parentheses denote a near equal preference for the pairs in each dimension; the letter in the parentheses having a slight numerical edge.

	Number	Composite Preference	E - I	S - N	T - F	J - P
Liberal Arts [z]						
Female	189	ENF(P)	5.4	-1.8	-6.7	-1.4
Male	114	EN(T)P	2.2	-1.9	2.7	-7.1
Difference between male/female			3.2	0.1	9.4	5.7
WSBE [y]						
Female	42	ESFJ	7.7	5.8	-4.5	3.4
Male	46	E(S)TP	4.2	1.7	4.5	-4.0
Difference between male/female			3.5	4.1	9.0	7.4
HHS [x]						
Female	40	E(S)FJ	6.8	-0.4	-7.5	-0.7
Male	11	(I)S(T)P	0.2	6.2	3.1	-4.9
Difference between male/female			6.6	6.6	10.6	4.2
CEPS [w]						
Female	17	ENF(P)	7.7	-3.2	-6.9	-2.6
Male	36	E(N)TP	1.9	0.2	7.3	-5.4
Difference between male/female			5.8	3.4	14.2	2.8

[z] Liberal Arts = College of Liberal Arts
[y] WSBE = Whittemore School of Business and Economics
[x] HHS = College of Health and Human Services
[w] CEPS = College of Engineering and Physical Sciences

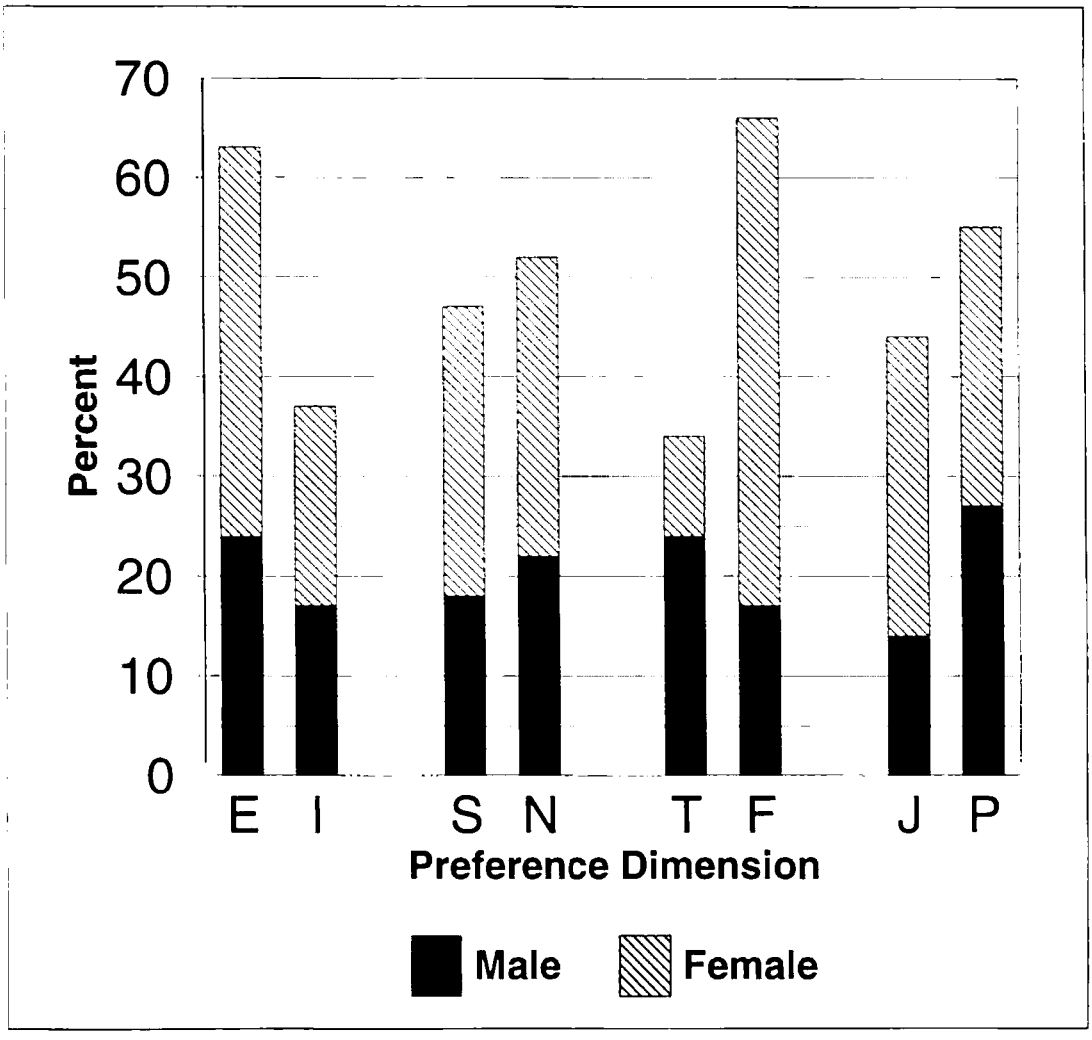

Figure 1. Learning preference for whole class divided by gender. Each pair of dimensions sums to 100%.

from the research literature is the difference due to gender. Our study is unique in that it measured this difference. In our class, females showed a very strong tendency toward the "F" type and also the "E" type. These dimensions suggest a strong need for group interactive-type activities and concern for what others think and feel. In a large class that is impersonal (i.e. limited or no positive feedback or student interaction), the MBTI suggests that these female students may not do well or may be prone to greater difficulties in being successful in the course. Gender differences should be acknowledged and these results strongly reinforce the notion that all classes should use a wide variety of teaching activities to help students be successful in the course. Possible ideas which will benefit female students ("F" types) are to make an effort to learn names and faces of these students so they have an identity in class. Another idea is to come to class 5 - 10 minutes early for the purpose of walking through the class and talking with the students. Students with "F" types respond positively to these techniques.

Educational Implications

The MBTI can provide teachers with a foundation that identifies, acknowledges and does justice to all types of learners. In order to be effective teachers, we must have some type of understanding of the make-up of the students we are attempting to teach. Knowing that students in a class have different learning styles can be a driving influence in giving instructors a desire to adapt their teaching techniques (Cooper and Miller, 1991; Barkley, 1995). By expanding from their preferred behaviors, instructors become more flexible, adaptable, and better equipped to handle a variety of teaching situations (Lawrence, 1984). Instructors and graduate students also need to have an understanding of their own learning preference because it can impact upon how they teach a course, react to student problems and concerns, and "reach" our students to help them learn.

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