

CHAPTER IV

COMPARATIVE STUDY OF THE PERSONALITY STRUCTURES OF INSERVICE TEACHERS AND STUDENT TEACHERS

Introduction

The current emphasis upon the qualitative preparations of teachers requires that increased attention be devoted to the nature and types of personality and/or attitude changes that occur during the teacher preparation process, as well as those occurring after the completion of professional training. Because the attitudes exhibited by teachers towards their students and towards teaching are recognized to be in part a reflection of their own personality organization, it would appear that increased effort should be devoted over time to enlargement and verification of evidence concerning the non-cognitive characteristics of teachers and student teachers teaching in various streams and subject specialisations. In a study of factors related to satisfaction or dissatisfaction with teaching, Beldsoe and Crafton (1968) concluded that dissatisfaction appears to be a function of the individual's personality. In short, the personality of teacher is a significant variable in the classroom. "Indeed", write Getzels and Jackson (1963), "some would argue it is the most significant variable."

Performance of Various Groups on Cattell's Sixteen
Personality Factor Questionnaire (16PF)

Inspite of the fact that a great deal of research has been done in the area of teacher education, there is particularly considerable paucity of evidence regarding the differences between inservice teachers teaching various subjects and student teachers with specialisations in different subject areas like Science, Commerce and Arts, to name a few only. However, very little research is available using personality inventories for this purpose. One of the reasons that seems understandable is that there are profound differences in what is meant by different personality inventories. This would, obviously make some research workers reluctant to use them for research since observations based on one definition will contradict observations based on another definition. A second hinderence in the research is the choice of the instruments.

Some significant research utilizing Cattell's Sixteen Personality Factor Questionnaire (16PF) has been done in this area (Lamke, 1961; Erickson, 1954; Hadley, 1954; Montross, 1957). However, the results seem contradictory and little research has been done with this instrument recently. Getzels and Jackson (1963) suggest that the 16PF has two specific advantages which warrant its use in this type of research : (1) it provides scores on factors that are not purely evaluative; and (2) it derives from an extensive programme of both theoretical and empirical work carried on over a number of years.

The purpose of this chapter is to determine whether personality differences exist (1) between the total sample of teachers and student teachers, (2) between inservice teachers of Science, Commerce and Arts, (3) between student teachers of Science, Commerce and Arts, and (4) between inservice teachers and student teachers when dichotomized on the basis of subject specialisations.

It is extremely important to note that the differences in the personality and other characteristics of teachers and student teachers belonging to different specialisations has been done because all teachers or student teachers cannot be treated as one lump. Getzels and Jackson (1963) remark significantly "....there is the limitation of treating teachers - male and female, young and old, primary grade and intermediate grade, teachers of English and of Science - as a single group. Often this is done even though differences within the teaching profession may obscure the very differences that need to be revealed."

SECTION A

(a) PERSONALITY STRUCTURE OF INSERVICE TEACHERS

Cattell's Sixteen Personality Factor Questionnaire (16PF) was administered to a total sample of 180 teachers, specializing in the teaching of Science, Commerce and Arts subjects. There was an equal number of 60 teachers in each group. The first purpose of this investigation, as stated in the Chapter I, was to determine the pertinent personality factors of the sample inservice teachers and also to find out whether there were any significant differences in the personality factors of these inservice teachers belonging to different teaching fields, viz. Science, Arts and Commerce. The following Table 1, shows the mean scores, standard deviations, and the respective ranks of the sixteen factors for the total group of inservice teachers, as measured by the Sixteen Personality Factor Questionnaire (16PF).

It is evident from the Table under reference that judged by the magnitudes of means of the different factors, the inservice teachers are highest on factors H (Venturesome), C (Stability), E (Dominance), A (Friendliness) and F (Surgency), while they are low on factors B (Intelligence), L (Suspiciousness), I (Sensitivity), Q₂ (Self-sufficiency) and O (Insecurity).

Table 1

Means, Standard Deviations and Rank Order
of Inservice Teachers on 16 PF (N = 180)

Factor	Rank	Mean	S.D.
A. Reserved Vs. Outgoing	IV	12.44	3.90
B. Less Intelligent Vs. More Intelligent	XVI	7.52	2.81
C. Less Stable Vs. More Stable	II	15.40	4.68
E. Submissive Vs. Dominant	III	13.10	4.80
F. Sober Vs. Happy-Go-Lucky	V	12.11	4.58
G. Expedient Vs. Conscientious	IX	11.03	3.92
H. Shy Vs. Adventurous	I	16.09	4.17
I. Toughminded Vs. Tenderminded	XIV	10.26	4.45
L. Trusting Vs. Suspicious	XV	8.56	3.71
M. Practical Vs. Imaginative	VIII	11.04	3.97
N. Forthright Vs. Shrewd	VI	11.71	4.31
O. Placid Vs. Insecure	XII	10.33	3.74
Q ₁ . Conservative Vs. Expedient	X	10.92	4.39
Q ₂ . Group Dependent Vs. Self-Sufficient	XIII	10.29	3.99
Q ₃ . Uncontrolled Vs. Controlled	XI	10.59	4.13
Q ₄ . Relaxed Vs. Tense	VII	11.57	4.09

Paraphrased, it would mean that the total sample of 180 teachers of this study as a group are adventurous, like to meet people, are friendly, responsive and genial (H+); they are emotionally mature, calm, unruffled and do not show restraint in avoiding difficulties (C+); again they are assertive, solemn, often headstrong and admiration demanding (E+); they are also good natured but easy going, ready to co-operate, like to attend to people, are warm and soft hearted and trustful (A+); they are

talkative, happy-go-lucky, frank and cheerful (F+). They are, however, of low mental ability and unable to handle abstract problems (B-), but they are tolerant, conciliatory and are ready to accept personal unimportance (L-); they are likely to accept little and though not lacking in taste have few artistic responses, they are also unaffected by 'fancies' (I-); they are group dependent, lacking in self-sufficiency, depend on social approval and are conventional (Q₂-); and finally they have no fears and are given to simple action, but are also self-confident and assured (O-).

Discussion

There is a popular belief that teachers are as diverse in their psychological traits as any other occupational group. This belief made Vernon (1953) to remark that, "it is fallacious to talk of personality as something distinct and consistent". In spite of this observation there is enough evidence at hand that demonstrates a relationship between some measures of personality and teaching effectiveness.

Cattell (1948) has offered some speculative hypothesis concerning the role of personality in teacher behaviour : "the general clinical knowledge of Cyclothyme - Schizothymics (Factor A) suggests Cyclothyme tendency would be favourable to teaching success. Surgency almost would certainly contribute to the ability to deal quickly with the behaviour and other problems of children." Again on Cattell's 16PF test, Lamke (1951) in America found that good teachers were distinguished by F+

(Happy-Go-Lucky), H+ (Venturesome), B- (Less Intelligence) and A+ (Outgoing, Warm Hearted) scores, while poor teachers tended to have F- and H- scores. Hadley (1954) found 'A' grade teachers low on F and high on G (Conscientious). Again, Cattell (1955) found teachers significantly higher on Factor A and low on Q₂ (Self-Sufficiency). The teachers were significantly higher on Factor L (Suspicious), M (Bohemian Unconcern), O (Apprehensive), Q₁ (Radicalism) and Q₄ (Psychosomatic Anxiety). The teachers were lower than the administrators on H (Venturesome).

Start (1966, 1968) in Britain, with mature secondary school teachers found Headmaster's rating of teaching skill significantly ($p < .5$) related to A-, B+, C-, E+, H+, L-, M+, Q₁+, and Q₃+. Warburton, et al (1963) with a large sample in Britain, found significant positive correlations with G, I and Q₃, with less relations to C and M. Mattson (1968) found G positively related to rated teacher success at junior level (.35) but negatively so among senior teachers (-.40). Perhaps, personality correlates, he suggests, must be examined in relation to teaching level.

In India, Kaul (1974) found eleven factors on Cattell's 16PF test differentiating between popular and unpopular teachers. The popular teachers were significantly higher on Factors A, B, C, G, H, N and Q₃ while unpopular teachers were higher on F, I, O and Q₄.

In spite of the clear caution of Goldstein (1967) that the instrument (Cattell's 16PF) must be considered quite

sensitive to cultural and national differences, if an effort were made to determine the positive factors of good teachers from the studies discussed above and from the point of view of successful and effective teachers needed in this country, one would suggest the following thirteen factors or a large number (if at all) of them to be present in the sample teachers : A+, B+, C+, E+, G+, H+, L-, M+, N+, Q₁+, Q₂-, Q₃+ and Q₄-.

It is really encouraging to note that the sample teachers here were very high on Factor H (Venturesome). This factor as, observed by Start (1966), indicates a resilience on the part of a teacher who is confronting alone a class of 60-70 children and this desirable quality provides the teacher a capacity to absorb shocks in the act of the teaching process every hour and every day. The sample teachers are not only emotionally stable but assertive also; they are happy-go-lucky and are self-sufficient too. So far so good but the two most needed personality characteristics of Factor G and M are conspicuously absent : (G and M occupy IX and VIII rank, respectively). It is to be noted that B, which ought to be on the higher side, occupies the bottom rank.

The teachers, perhaps it would be hardly disputed, need to have a high super-ego strength, be perserving, determined, emotionally disciplined, conscientious and concerned about the moral standards and rules : (G+); they should also be imaginative, interested in Arts, enthralled by Inner Creation, in short to quote Cattell (Handbook, 1976, p.98), have an "intense subjectivity and inner life," (M+). B- (Less Intelligence) is

again a dismal factor. It needs no emphasis that teachers, who are to shape the destiny of this country, need be of higher mental structure. In this context one cannot but agree with Yate's (1972) observation made on a different sample :

"...intending teachers have relatively low level of ability and attainment (in relation to other professions that is); from this group we find evidence of a somewhat low level of motivation, a restricted range of interests, a tendency towards passive convergent thinking."

In the end it is to be noted that while the sample teachers are high on E (assertative, solemn, often headstrong and admiration demanding), they are at the same time low on Q_2 (group dependent, lacking in self-sufficiency, dependent on social approval more and being conventional. Concerning Factor Q_2 - on which the teachers of this sample have a lower (XIII) rank - Cattell (1957) stated that the high Q_2 individual would rather work with one or two assistants than with a committee, prefers reading to classes, does not avoid doing things that might make him seem odd, would rather be an artist than a secretary, is not afraid of his own ideas just because they are odd Q_2 individuals avoid society, because it wastes time, not because of any emotional rejection, and because experience has told him his thinking is well enough organized to solve problems for himself."

The description of Q_2^- , contrary to above, is being group dependent, lacking in self sufficiency, dependent on social approval more and conventional. This factor (Viz. Q_2^-)

is more in agreement with a high A (good natured but easy going, ready to cooperate, soft and warm-hearted, F+ (talkative, happy-go-lucky, frank and cheerful) and L- (tolerant, conciliatory and ready to accept personal unimportance) of the 180 sample teachers of this study. However, further research is needed to verify the apparent phenomenon of a high E and low Q₂.

Inter-Group Differences Among Teachers

One of the limitations that plagues research on teacher personality characteristics as well as teacher effectiveness is that it is conducted in a "theoretical vacuum" where "hypotheses are based upon an oversimplification of teacher personality and teaching situations," (Getzels and Jackson, 1963). An example in this direction is that of treating teachers and student teachers in various fields and specialisations - teachers of Science - Commerce - Arts, English, etc. as a single group (Getzels and Jackson, 1963). As a result of such an exercise it leads both to inadequate methodology and conclusions which do not agree with psychological and commonsense considerations. It was, therefore, one of the purposes of this investigation to study whether there are any differences in the personality characteristics of three groups of teachers and student teachers teaching Science, Commerce and Arts in high and higher secondary schools and under training respectively. The following data and the subsequent interpretation and discussion seek to provide an answer to this important question.

(i) Rank Order of Personality Characteristics
of Teachers

In order to make a quick and superficial comparison of Science, Commerce and Arts inservice teachers with each other an attempt has been made to rank all the 16 Personality Factors from highest to lowest for each group on the basis of mean scores. The relative position of the different values thus obtained are given in the following Table 2.

Table 2
Rank Order of 16 PF for Science, Arts
and Commerce Teachers

Ranks	Science Teachers (N = 60)	Arts Teachers (N = 60)	Commerce Teachers (N = 60)
I	H (16.00)	H (16.40)	H (16.45)
II	C (15.29)	C (15.43)	C (15.50)
III	E (14.59)	A (13.76)	E (13.99)
IV	Q ₂ (12.67)	F (13.42)	A (13.49)
V	N (12.60)	Q ₄ (11.77)	F (12.95)
VI	Q ₁ (12.25)	I (11.21)	N (12.20)
VII	Q ₄ (11.23)	E (10.85)	Q ₄ (11.65)
VIII	G (11.05)	M (10.84)	M (11.50)
IX	M (10.75)	G (10.70)	G (11.45)
X	Q ₃ (10.51)	O (10.45)	Q ₃ (11.05)
XI	A (10.35)	Q ₃ (10.15)	O (10.60)
XII	F (10.00)	Q ₁ (10.06)	Q ₁ (9.80)
XIII	O (9.95)	N (9.40)	I (9.50)
XIV	L (8.55)	Q ₂ (9.19)	Q ₂ (9.07)
XV	B (8.70)	L (8.15)	L (8.85)
XVI	I (8.35)	B (6.60)	B (7.35)

It is obvious from the Table under reference that all the three groups of teachers have awarded the I and II ranks to factor H (Shy Vs. Adventurous), and factor C (Less Stable Vs. More Stable). The Science and Commerce teachers have ranked factor E (Submissive Vs. Dominant) as III while the Arts teachers have ranked it as VII. Again Science and Commerce teachers have ranked factor Q₄ (Relaxed Vs. Tense) as the VII whereas Arts teachers ranked it V. The Arts and Commerce teachers have ranked factor M (Practical Vs. Imaginative) as VIII but Science teachers have ranked factor G (Expedient Vs. Conscientious) as VIII. Once again the Science and Commerce teachers have given X rank to factor Q₃ (Uncontrolled Vs. Controlled), whereas Arts teachers have given this rank to factor O (Placid Vs. Insecure). Factor A (Reserved Vs. Outgoing) gets XI rank on the part of Science teachers while Arts and Commerce teachers have ranked it III and IV respectively. While factor Q₁ (Conservative Vs. Expedient) has been awarded XII rank by Arts and Commerce teachers, the Science teachers have ranked it VI. The Arts and Commerce teachers have ranked factor Q₂ (Group Dependent Vs. Self-Sufficient) as XIV, whereas Science teachers have awarded it a high rank, viz. IV. Again, Factor L (Trusting Vs. Suspicious) has been ranked XV, by Arts and Commerce teachers, the Science teachers are just near it : rank XIV. The same picture holds true for factor B (Less Intelligent Vs. More Intelligent) to which Arts and Commerce teachers have given the bottom rank viz. XVI, whereas Science teachers have ranked it as XV. This phenomenon is note-worthy.

Factor I (Toughminded Vs. Tenderminded) has been awarded XVI rank by Science teachers, the Arts and Commerce teachers have awarded it VI and XIII ranks, respectively. The conclusion derived from the above phenomenon suggests that there are some variations in the ranking of the Sixteen Personality Factors on the part of the three groups of teachers.

(ii) Next, an attempt was made to find out the rank order correlation between the Sixteen Personality Factors for the three groups of teachers. As already noted above the ranking was done on the magnitude of means. The rank correlation was done for the three groups, taking two at a time. Rhos for different groups are given in Table 3.

Table 3
Rank Order Correlation Between Three Groups
of Teachers on Cattell's 16 PF Test

S.No.	Groups compared	rho	<u>P</u>
1.	Science and Arts Teachers	0.320	NS
2.	Science and Commerce Teachers	0.628	.01
3.	Arts and Commerce Teachers	0.822	.01

It is obvious from the above Table that there is no agreement between Science and Arts Teachers in the ranking of the Sixteen Personality Factors but that is not the case with Science and Commerce teachers and also Arts and Commerce teachers in whose case the rhos are substantially significant at .01 and .01 level, respectively. But the conclusion is

implicit that there is no perfect correlation between Science and Commerce and between Arts and Commerce teachers in the ranking of Sixteen Personality Factors of Cattell's Questionnaire.

(b) ANALYSIS OF VARIANCE

Whenever in research there are more than two sets of measurements on the same instrument or the same experimental variable, each under its own set of conditions or for different samples, analysis of variance is the technique to test the significance of difference between the means or other statistics, in such cases. This procedure not only reduces the amount of labour involved but is defensible on the robust statistical reasoning in that, "if we tested each pair separately, we would use an estimate of the population variance only the data from two samples involved. If we make the null hypothesis apply to all the samples - that they arose by random sampling from the same population - we could use all the data from which to make a much more stable estimate of the population variance"(Guilford, 1956). Another advantage of the analysis of variance is that, "there is ample evidence that marked skewness, departures from normal kurtosis, and extreme differences in variance, do not greatly disrupt the F test as a basis of judging significance in the analysis of variance" (McNemar, 1962).

Consequently, analysis of variance was used to compare the personality structures of the three groups of Science, Arts and Commerce teachers and student teachers. But a significant F tells that there are nonchance variations among the means

somewhere in the list of sets, it is not known how many or which ones are significantly different. Therefore, t-test was used to test the significance of the difference between any two groups on each personality factor which indicated significant F-ratios. The F-ratios and t-test for all the Sixteen Personality Factors for the three groups of inservice teachers and three groups of student teachers are presented in Appendix C and D (Tables I - XVI and XXV - XL). However, Table 4 gives a summary of Means, S.D.'s and F-ratios on the 16 PF scales for the three groups of Science, Arts and Commerce teachers only.

Table 4 indicated that the three groups of teachers were significantly different on eight of the sixteen factors assessed by the 16 PF Questionnaire. The eight factors were :

- A (Reserved Vs. Outgoing);
- B (Low Intelligence Vs. High Intelligence);
- E (Submissive Vs. Dominance);
- F (Desurgency Vs. Surgency);
- I (Toughminded Vs. tenderminded);
- N (Forthright Vs. Shrewd);
- Q₁ (Conservative Vs. Radicalism);
- Q₂ (Group Dependency Vs. Self-sufficiency).

Contd.

Table 4

Summary of Means, Standard Deviations and F Ratios for Raw Scores on 16PF Scales for Three Groups of Teachers

16PF	Science Teachers (N = 60)		Commerce Teachers (N = 60)		Arts Teachers (N = 60)		F-Ratio
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
A	10.37	3.39	13.49	3.30	13.76	3.32	17.70*
B	8.70	2.34	7.35	2.54	6.60	2.61	9.60*
C	15.29	4.34	15.50	4.91	15.43	4.43	0.40
E	14.59	4.54	13.99	4.64	10.85	4.39	11.67*
F	10.00	4.10	12.95	4.16	13.42	4.61	11.13*
G	11.05	3.77	11.45	3.86	10.70	3.80	0.41
H	16.00	4.13	16.45	3.97	16.40	3.98	0.24
I	8.35	3.84	9.50	4.08	11.21	3.70	23.19*
L	8.55	3.82	8.85	3.65	8.15	3.61	0.59
M	10.75	3.61	11.50	4.15	10.84	3.92	0.57
N	12.60	3.44	12.20	3.59	9.40	3.54	11.07*
O	9.95	3.69	10.60	3.59	10.45	3.59	0.47
Q ₁	12.25	3.53	9.80	4.45	10.06	4.00	8.54*
Q ₂	12.67	3.72	9.07	3.32	9.19	3.55	18.81*
Q ₃	10.51	4.10	11.05	4.00	10.15	3.89	0.64
Q ₄	11.23	4.00	11.65	4.32	11.17	3.89	0.16

* F significant Beyond .01 level

(c) Tables 5 through 7 contain the summary of the various t-test combinations for those factors with significant F ratios for the groups of Science-Arts, Science-Commerce and Arts-Commerce teachers.

An examination of Table 5 indicates that Science and Arts teachers differ on eight of the sixteen factors :
A (Reserved Vs. Outgoing); B (Low Intelligence Vs. High Intelligence); E (Submissive Vs. Dominance); F (Desurgency Vs. Surgency); I (Toughminded Vs. Tenderminded); N (Forthright Vs. Shrewd); Q₁ (Conservative Vs. Radicalism) and Q₂ (Group Dependency Vs. Self-Sufficiency).

It is evident from Table 6 that Science and Commerce teachers differ only on four of the Sixteen Factors; A (Reserved Vs. Outgoing); F (Desurgency Vs. Surgency); Q₁ (Conservatism Vs. Radicalism); and Q₂ (Group Dependency Vs. Self-Sufficiency).

Again Table 7 reveals that Commerce and Arts teachers differ only on the three of the Sixteen Factors : E (Submissive Vs. Dominance); I (Toughminded Vs. Tenderminded), and N (Forthright Vs. Shrewd). And there may be reasons for the noted differences.

Contd.

Table 5

Summary of Mean Comparisons of Science and Arts Teachers on Those 16 Personality Factors with Significant t ratios

Factor	<u>Mean</u> Science Teachers (N = 60)	<u>Mean</u> Arts Teachers (N = 60)	t	<u>P</u>
A	10.37	13.76	5.55	Beyond .01
B	8.70	6.60	4.67	Beyond .01
E	14.59	10.85	4.56	Beyond .01
F	10.00	13.42	4.28	Beyond .01
I	8.35	11.21	4.14	Beyond .01
N	12.60	9.40	5.00	Beyond .01
Q ₁	12.25	10.06	3.17	Beyond .01
Q ₂	12.67	9.19	5.19	Beyond .01

Table 6

Summary of Mean Comparisons of Science and Commerce Teachers on These 16 Personality Factor with Significant t ratios

Factor	<u>Mean</u> Science Teachers (N = 60)	<u>Mean</u> Commerce Teachers (N = 60)	t	<u>P</u>
A	10.37	13.49	5.12	Beyond .01
B	8.70	7.35	0.91	NS
E	14.59	13.99	0.71	NS
F	10.00	12.95	3.88	Beyond .01
I	8.35	9.50	1.60	NS
N	12.60	12.20	0.63	NS
Q ₁	12.25	9.80	3.31	Beyond .01
Q ₂	12.67	9.07	5.63	Beyond .01

Table 7

Summary of Mean Comparison of Commerce and Arts Teachers on Those 16 Personality Factors with Significant t ratios

Factor	Mean	Mean	t	P
	Commerce Teachers (N = 60)	Arts Teachers (N = 60)		
A	13.49	13.76	0.45	NS
B	7.35	6.60	1.63	NS
E	13.99	10.85	3.78	Beyond .01
F	12.95	13.42	0.59	NS
I	9.50	11.21	2.41	.05
N	12.20	9.40	4.30	Beyond .01
Q ₁	9.80	10.60	0.33	NS
Q ₂	9.07	9.19	0.19	NS

More specifically, the following conclusions can be drawn from Tables 5, 6, and 7.

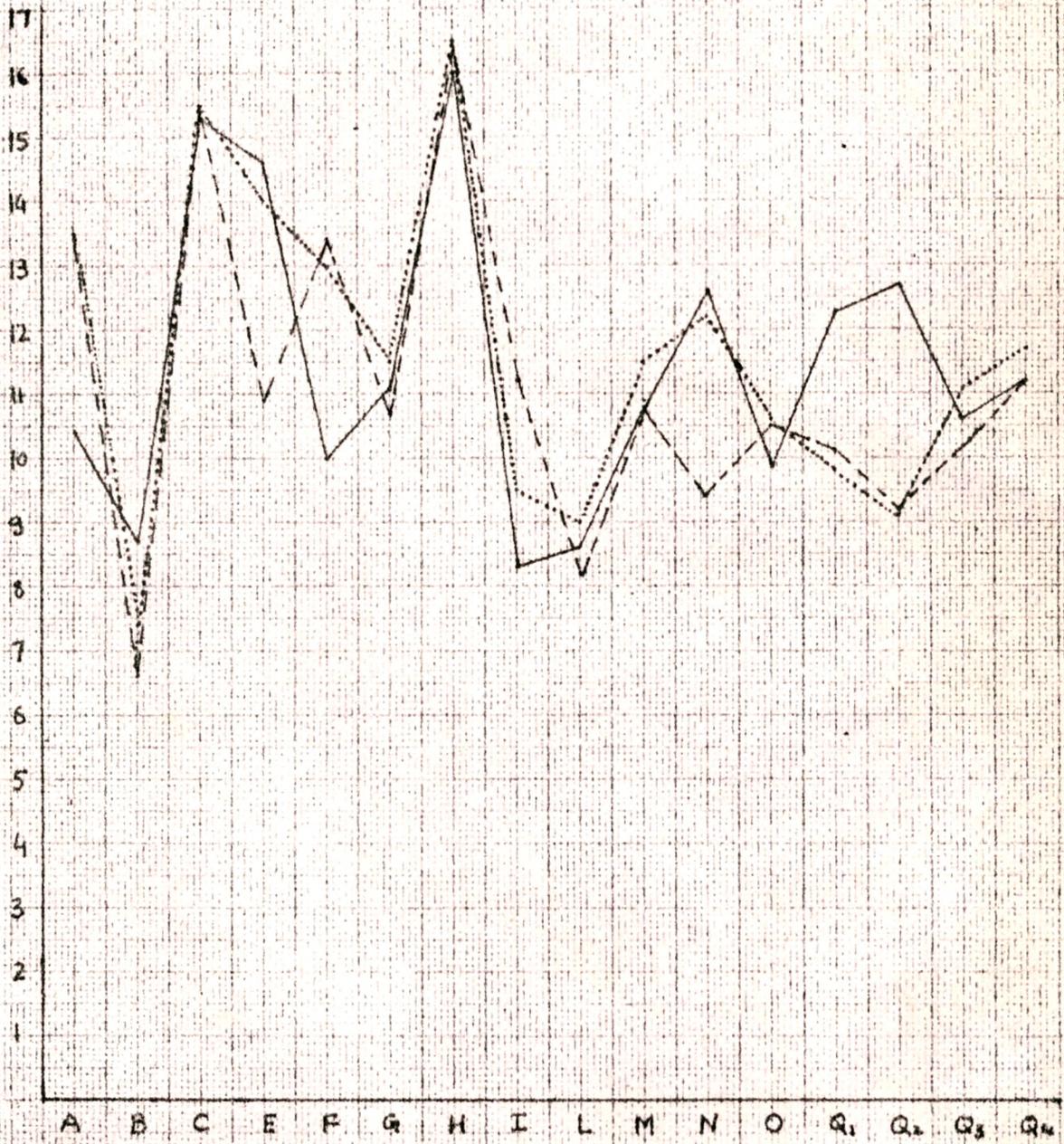
(a) Science and Arts Inservice Teachers

1. Science Teachers are more Shrewd (N+), Experimenting (Q₁) and Self-sufficient (Q₂+) than Arts teachers who are Forthright (N-), Conservative (Q₁-), and Group Dependent (Q₂-).
2. Science teachers are more Humble (E+) than Arts teachers who are Assertive (E-).
3. Science teachers are more Intelligent (B+) than Arts teachers who are less Intelligent (B-).
4. Arts teachers are more Outgoing, Warmhearted (A+), Happy-Go-Lucky (F+), and are more Tenderminded (I+) than Science teachers who are Reserved (A-), Sober (F-) and Toughminded (I-).

- (b) Science and Commerce Inservice Teachers
1. Science teachers are more Experimenting (Q_1+), and Self-sufficient (Q_2+), than Commerce teachers who are Conservative (Q_1-) and Group Dependent (Q_2-).
 2. Commerce teachers are more Out-going, Warmhearted (A+), and Happy-Go-Lucky (F+) than Science teachers who are Reserved (A-) and Sober (F-).
 3. Science and Commerce teachers are not significantly different on the Factor B (Intelligence).
 4. Science and Commerce teachers are not significantly different on Factor E (Humble Vs. Assertive) Factor I (Toughminded Vs. Tenderminded) and Factor N (Forthright Vs. Shrewd).
- (c) Commerce and Arts Inservice Teachers
1. Commerce teachers are more Assertive (E+) and more Shrewd (N+) than Arts teachers who are Humble (E-) and Forthright (N-).
 2. Arts teachers are more Tenderminded (I+) than Commerce teachers who are Toughminded (I-).
 3. Commerce teachers and Arts teachers are not significantly different on Factor B (Intelligence).
 4. Commerce teachers and Arts teachers are not significantly different on Factor A (Reserved Vs. Outgoing), Factor F (Sober Vs. Happy-Go-Lucky), Factor Q_1 (Conservative Vs. Experimenting) and Factor Q_2 (Group Dependent Vs. Self-sufficient).

The raw score means of the 16PF Test were plotted as shown in Figure I. The graphical representation of the data, as shown here, clearly demonstrate an overlapping of the 16PF scales where there were no significant differences between the three groups of teachers. Contrary to this, there were

FIGURE I
 1987 PROFILE OF SCIENCE, ARTS AND COMMERCE INSERVICE TEACHERS



_____ Science Inservice Teachers
 - - - - - Arts Inservice Teachers
 Commerce Inservice Teachers

sharp differences reflected in the curves where there were significant \pm differences. This representation, thus, lends further support to the results arrived at.

Discussion

In general, it seems reasonable to hypothesize that the quality of education depends on the personality characteristics of teachers. Their relationship with individual pupils and classes, their skills in motivating pupils and managing classroom activities will be shaped and conditioned by their personality characteristics. In fact, the effectiveness and ineffectiveness (Cattell, 1958; Start 1968) popularity and unpopularity (Kaul, 1974) will depend on their personality characteristics.

A more important point which needs an emphasis, but has received little research attention, is the fact that different teaching fields and specialisations call for some different personality characteristics unique to each field. For instance, Watson (1963) has pointed out that behavioural scientists have done very little personality research on students and teachers in science courses. The few extant studies of Science teachers have not compared this group with teachers of other subjects. Moreover, a number of interesting questions, for instance, have been raised about the Science teachers personality, but few have been investigated empirically (Watson, 1963). McLain (1968) in his study has concluded that, "it may be that successful teaching in different teaching

fields calls for personality configuration unique to each field."

The results of this study clearly demonstrate the fact there are differences in the personality characteristics of Science, Arts and Commerce teachers. The Science and Arts teachers differ on eight factors, the Science and Commerce teachers differ on four factors and Commerce and Arts teachers differ on three factors, of the Sixteen Factors measured by Cattell's 16PF test, used in this investigation.

The Science teachers of this study are (i) more shrewd (N+), experimenting (Q₁+) and self-sufficient (Q₂+) than the Arts teachers who are conservative (Q₁-), group dependent (Q₂-) and forthright (N-). Again Factor Q₁⁺, and Factor Q₂⁺ differentiate the Science and Commerce teachers who like the Arts teachers are again, conservative (Q₁-) and group dependent (Q₂-). However, Science and Commerce teachers do not differ on Factor N.

There seems some justification, perhaps, in the conclusion that the personality configuration of Science teachers is in tune with the demands of their discipline, where qualities of experimentation and self-sufficiency are the prize possessions. Regarding the importance of Factor Q₁⁺ Cattell (Handbook, 1976, p.252) observes that, "the results show, incidentally that Q₁⁺, as we have stated, is not a narrow political behaviour trait but a broad experimenting personality characteristic." Again, it is obvious that a high Q₂ individual would work with one or two assistants than with a committee,

perhaps reading to classes, does not avoid doing things that might make him seem odd... he is not afraid of his own ideas just because they are odd" (Cattell, 1957). He would be a gardener than a salesman, to put it briefly.

Science teachers as compared to Arts teachers (but not Commerce teachers) again are significantly low on A. They (Science teachers) are reserved, pre-occupying themselves with things and ideas rather than with people. Combined with I-, Science teachers have some sort of emotional instability which permits radical restructuring and creativity (Cattell, 1968). Arts teachers are high on A+ (Outgoing and Warmhearted and Group Dependent, Q₂-). Cattell (Handbook, 1976, p.116), on the basis of second-stratum factors *measured* by the 16PF test, has shown that A+, E+, F+, H+ and Q₂- demonstrate extroversion. In the sample of teachers (Science Vs. Arts) the Arts teachers show slight extroversion (A+, F+, and Q₂-), though there is a clear evidence of contradiction with clear E+ (in favour of Science teachers) and an absence of Factor H. The same picture of extroversion is manifest in the case of Commerce Vs. Science teachers with A+, F+ and Q₂-. It is, however, important to note that there are no significant differences on these factors between Commerce and Arts teachers of this study.

Again, Cattell (Handbook, 1976, p.116) has shown that E+, L+, H+, Q₁+ and Q₂+ (second-stratum factors) are characteristic of "independence and penetration of mind". Most of the Witkin's (1954) and Thurston's (1938) perceptual behaviours, sometimes called "field independence" appear to be expression

of this factor." The Science teachers as compared to Arts teachers have significantly high E+, Q₁ and Q₂, and as compared to Commerce teachers who have high Q₁ and Q₂. Factors L+ and M+ are completely absent in all the three groups. This would, perhaps, make one to conclude that Science teachers of this study are somewhat more independent and radical than Arts and Commerce teachers. Concerning the general group differences (recognizing the limitations of a small sample and other constraints of this study) it could be said that there is a tendency for the Science Vs. Arts and Commerce dichotomy to reflect self-sufficient radicalism and independence Versus group dependent and subdued conservatism.

It is somewhat significant that out of the Sixteen Factors there are only three factors on which Commerce and the Arts students, differ, viz. E (Humble Vs. Assertive), I (Toughminded Vs. Tenderminded) and N (Forthright Vs. Shrewd). The Commerce teachers are more assertive and shrewd as against Arts teachers who are tenderminded. Concerning the group differences it could be concluded that there is a somewhat tendency for Commerce Versus Arts dichotomy only between Shrewd (N+) unsentimental assertion (I+) Versus affection expecting tendermindedness (I+).

One significant phenomenon that needs attention is that the Science teachers are significantly superior to Arts but not Commerce teachers on Factor B. In short, relatively high intelligence (B+), a reserved nature (A-) with a high assertion (E+) and experimental attitude (Q₁) coupled with

self-sufficiency which favour creativity and independence of mind (Q_2) on the part of Science teachers can lead to sub-average leadership scores and as such they cannot be a great success, whatever their other merits, as leaders. Science teachers, however, are favourably placed as they can inculcate experimental and creative attitudes in their children. They would be open-minded and not suppress uncomfortable question and non-conformist attitudes. This would enable the students to realize their potential. This would be their great reward.

Students like friendly outgoing, warmhearted A+, happy-go-lucky (F+), and tenderminded (I+) teachers as shown by Kaul (1974). They will not be only popular teachers but leaders as well. That is the picture presented by the Arts and Commerce teachers of this study.

Be that as it may, the results of this study regarding the Science teachers are in a broad agreement with the study of Wilcox (Cattell, Handbook, p.183) where "profile for 117 high school teachers of mathematics attending a summer NSF Institute shows them to be low on A, F, H and I and slightly above average on N." It is to be noted that Factor H is absent in the sample of Science teachers here.

The results of the sub-groups of Science, Arts and Commerce teachers cannot be, by and large, in agreement with other studies in USA and U.K. only because of "cultural and national differences" which have been recognized by Cattell (Handbook, 1976, p.250) but also on account of the fact that no studies using the sub-groups of teachers were available.

Besides there is the observation of Goldstein (1967) that the instrument must be considered quite sensitive to cultural differences.

In the end it is important to bear in mind that since no steps were taken to insure that each group studied was actually representative of a larger section of the teacher population in the three fields, one is in no position to generalize from the present results on the mean scores, however, suggestive they might be.

SECTION B

(a) PERSONALITY STRUCTURE OF STUDENT TEACHERS

It will be recalled that Cattell's Sixteen Personality Factor Questionnaire (16 PF) was administered to a total of 180 student teachers in the Teachers' Colleges situated in the Ajmer District of Rajasthan. These 180 student teachers had offered their specialisation in the teaching of Science, Commerce and Arts. There was an equal number of 60 student teachers in each group. The second purpose of this study, as stated in Chapter I, was to determine the pertinent personality factors of those sample student teachers and also to find out if there were any significant differences in the personality factors of the three groups. The raw score means, standard deviations and the respective ranks on the sixteen factors as measured by the Sixteen Personality Factor Questionnaire (16PF) are presented in Table 8.

Table 8 reveals clearly that the first five ranks have been awarded by the student teachers to H (Venturesome), E (Dominance), O (Insecurity), Q₄ (Tenseness) and F (Surgency) and the last five have gone to B (Intelligence), N (Shrewdness), I (Sensitivity), L (Suspiciousness) and M (Unconventionality).

The total sample of 180 student teachers, it would mean, are adventurous, like to meet people, are friendly, responsive, and genial (H+); are also assertive, solemn, often head strong and admiration demanding (E+); are insecure,

Table 8

Means, Standard Deviations and Rank Order of Student Teachers on 16PF (N=180)

	Factor	Rank	Mean	S.D.
A	Reserved Vs. Outgoing	VII	11.64	3.95
B	Less Intelligent Vs. More Intelligent	XVI	6.11	2.59
C	Less Stable Vs. More Stable	VI	13.09	4.47
E	Submissive Vs. Dominant	II	14.90	4.90
F	Sober Vs. Happy-Go-Lucky	V	13.42	3.96
G	Expedient Vs. Conscientious	XI	10.87	4.30
H	Shy Vs. Adventurous	I	15.01	4.49
I	Toughminded Vs. Tenderminded	XIV	9.94	3.89
L	Trusting Vs. Suspicious	XIII	10.36	4.22
M	Practical Vs. Imaginative	XII	10.60	4.01
N	Forthright Vs. Shrewd	XV	9.69	4.39
O	Placid Vs. Insecure	III	14.22	5.35
Q ₁	Conservative Vs. Experimenting	IX	11.18	4.11
Q ₂	Group Dependent Vs. Self-sufficient	VIII	11.37	3.84
Q ₃	Uncontrolled Vs. Controlled	X	11.02	4.26
Q ₄	Relaxed Vs. Tense	IV	13.99	4.55

apprehensive, worrying, anxious and easily overcome by moods (O+); are characterized by high ergic tension, are tense, frustrated and overwrought (Q₄); and are, again, talkative, happy-go-lucky, frank and cheerful (F+). They are, however, of low mental ability (B-); are forthright, unpretentious, with simple tastes and a blind trust in human nature (N-); are, again, without illusions, have few artistic responses and are unaffected by 'fancies' (I-); they also accept personal unimportance, are tolerant and conciliatory (L-); and are conventional, not absorbed in ideas, though frequently worried but alert to practical needs (M-).

Discussion

The importance of the personality characteristics that the student teacher brings with him to the profession cannot be underestimated. These characteristics would be more central to the core of the personality and probably less readily altered. Although studies have not clearly distinguished such a personality type, it has been suggested by Brookover (1955) that the core personality of a beginning teacher stands in opposition to those characteristics he feels pressured to assume. He describes the neophyte as being introverted; he has been, again, characterized as "rather marginal in commitment to the profession, more inclined to follow than to lead, with a strong sense of service and a cooperative, somewhat resigned, spirit." Some of the most basic work on teacher personality has been done by Ryans (1960). The important

point he emphasized was that the teacher's personal characteristics would appear to have their sources in both his learned and unlearned background (p.21).

Cattell (Handbook, 1976) has isolated five characteristics he considered to correlate with success in professional occupations: dominance (E+), lack of inhibition (F+), imagination (M+), shrewdness (N+) and liberalism (Q₁). Warburton and others (1963) in Britain demonstrated G+ (Conscientiousness), I (Tendermindedness), and Control (Q₃+) significantly related at .05 level to teaching ability. The results of Tarpey's (1965) investigation, where she studied 120 student teachers studying in three colleges in Ireland and one college in England, demonstrated varying results : M was significantly related to success in teaching in two Irish College alone; Factors Q₂, Q₄, N, I and L showed positive but insignificant relationship in three colleges; while Factors Q₁, O and G showed negative insignificant relationships. Factor G, however, was significant in one college only.

Henjum (1967) reported the personality characteristics of secondary student teachers. He found that only two factors B+ and F+ were related to teaching success at the secondary level. Cortis (1969) tested 259 students in Manchester School of Education and found that 16PF Questionnaire related with Educational Theory but it failed to reveal any significant relationship to practical teaching such as Warburton, Butcher and Forrest (1963) found in case of Factors : Conscientiousness, Sensitivity and Self-discipline. McLain (1968) in his study

found that superior male students teachers differed significantly from inferior ones on nine scales of 16PF (Factors G, H, L, Q₄, Q₁, A, B, C and N). In Davis and Satterly's (1969) study of student teachers, the 'high' group was significantly different than the 'low' on four factors : G, I, O and Q₄.

Mitchell (1963b) found significant personality factors associated with different motivations for entering teaching. Source traits A, E, F, G, Q₃ and Q₄ were involved in the patterns. De Blassie (1971) reported a study where he compared four groups of teachers. His results indicated that the four groups differed on E+, I+, N+, and O+.

In India an important study by Gupta (1974), who administered 16PF test to 169 Science, Agriculture and Commerce teachers showed that when the sixteen factors were listed in rank order the first five important factors were G+, H+, I+, Q₃ and Q₂+. The last important from the point of rank order were F-, Q₄-, E- and C-. Again, Raina (1978) conducted a study on 110 B.Ed. students using Cattell's 16PF test. He found that the high ability group (teaching marks), rated by supervisors of different orientations and background, had E-, Q₁-, N+, Q₄, C+ and M-.

The purpose of reporting in brief the above researches done with the 16PF test - the instrument used in this study - was to demonstrate the fact that there was no close agreement of the personality characteristics of prospective secondary teachers. One of the main reason that plagues teacher education research, not only in India but abroad also, is the absence

of an operational definition of teacher effectiveness. Again recognizing the importance of the cultural background of personality (Linton, 1945), the important common factors on which a broad consensus seems to be obvious are the following factors :

B+ (High Intelligence), F- (Sober),
G+ (Conscientious), I+ (Tenderminded),
N+ (Shrewd), Q₁+ (Experimenting, and
Q₂+ (Self-sufficient).

But the personality characteristics of the 180 sample student teachers of this study do not have any positive characteristics. They, on the other hand are venturesome, assertive, apprehensive, tense but happy-go-lucky - characteristics hardly calculated to make them successful in the teaching profession or the teaching act. No doubt, a high H (Venturesome) may be commendable in that it can act a shock observer in the classroom teaching, where 60-70, young restless children are to be handed, but low intelligence, lacking in high tastes, unaffected by "fancies", acceptance of personal unimportance and high degree of conventionality accompanied by frequent worrying, though alert to practical needs, can hardly be conducive to successful teaching either as a profession or as an effective teaching act. However, it can be understood that under the present day conditions of teacher training where the student teacher are subject to great harassment by the college faculty and the faculty evaluation procedures the student teachers can feel an inadequacy and sincerely worried, as well as apprehensive (O+). But mature student teachers who

are tense and frustrated will hardly be successful in or outside the school. The fact of the matter is that there are no standard selection and retention procedures. The selection procedure for B.Ed. in the teachers' colleges in Rajasthan are unfortunately clerical and not academic. The minimum basic requirement is forty percent marks in the aggregate at the graduating level.

Intergroup Differences Among Student Teachers

It was observed in the preceding section A that it was an escape or an oversimplification to treat teachers as a "single group" (Getzels and Jackson, 1963), when research on teacher personality was the single aim. Evidence is now at hand that all teachers, may be equal in the eyes of God and the laws of the land but they are hardly in the possession of the same personality characteristics when specialising in the teaching of various field like Science, Commerce or other Arts subjects. Is this true in the case of the student teachers also? An attempt will be made to present evidence with respect to this important question.

(i) Rank Order of Personality Characteristics of Student Teachers

All the Sixteen Personality Factors in the Sixteen Personality Factor Questionnaire were ranked with respect to the magnitude of the raw score means from the highest to the lowest for the three groups of Science, Commerce and Arts

student teachers. The relative position of the different values thus obtained are presented in Table 9.

Table 9
Rank Order of 16PF for Science, Arts
and Commerce Student Teachers

Ranks	Science Students (N = 60)	Arts Students (N = 60)	Commerce Students (N = 60)
I	H (15.70)	E (14.71)	E (15.95)
II	E (15.31)	O (14.45)	H (15.94)
III	O (14.39)	F (14.20)	C (14.06)
IV	Q ₄ (13.75)	Q ₄ (14.14)	Q ₄ (13.90)
V	C (13.04)	I (13.40)	O (13.84)
VI	F (12.87)	H (13.35)	F (13.13)
VII	Q ₂ (12.25)	A (12.20)	A (13.01)
VIII	Q ₁ (12.15)	L (11.99)	Q ₂ (11.45)
IX	Q ₃ (11.05)	M (11.90)	G (11.15)
X	I (10.65)	C (11.78)	Q ₁ (11.14)
XI	G (10.40)	G (10.95)	Q ₃ (11.11)
XII	N (10.15)	Q ₂ (10.40)	M (10.40)
XIII	A (9.65)	Q ₁ (9.94)	N (9.75)
XIV	L (9.50)	Q ₃ (9.93)	L (9.56)
XV	M (9.45)	N (9.01)	I (9.35)
XVI	B (6.75)	B (6.06)	B (6.45)

A study of the Table under reference reveals the fact that E(Humble Vs. Assertive) has been given the I rank by Commerce and Arts students while Science students have given it a II rank. The Arts students have awarded II rank to O (Placid Vs. Apprehensive), the Commerce students have awarded it V rank and the Science students the III rank. Commerce students have allotted III rank to C (Affected by Feelings Vs. Emotionally Stable) but the Science students have allotted it V rank and the Arts students X rank. There is, however, a close agreement between the three groups of students in giving IV rank to Q₄ (Relaxed Vs. Tense). Factor I (Toughminded Vs. Tenderminded) occupies V rank on the part of Arts students, but the Commerce students and Science students have given it XV and X ranks, respectively. The Arts students have awarded VI rank to the H (Shy Vs. Venture-some) but the Commerce and Science students have given VII rank to A (Reserved Vs. Outgoing), the Science students have given it XIII, the Science students have allotted VII rank to Q₁ (Conservative Vs. Experimenting), the Commerce and Arts students have given it X and XIII ranks, respectively. The Arts students have given M (Practical Vs. Imaginative) IX rank but Science and Commerce students have given it XV and XII rank respectively. Factor G (Expedient Vs. Conscientious) has been given XI rank by Science and Arts students but the Commerce students have given it IX rank. Arts students have given XII rank to factor Q₂ (Group Dependent Vs. Self-sufficient) while Science and Commerce students have given it III

and VIII ranks, respectively. Factor N (Forthright Vs. Shrewd) has been awarded XIII rank by Commerce students while Science and Arts students have given it XII and XV ranks, respectively. Factor Q₃ (Undisciplined Self Conflict Vs. Controlled) has been allotted XIV rank by Arts students but Science and Commerce students have allotted it IX and XI ranks, respectively. Factor L (Trusting Vs. Suspicious) has been given XIV rank by Science and Commerce students but Arts students have given it VIII rank. All the three groups agree strongly in awarding B (Less Intelligent Vs. More Intelligent) as the bottom rank viz. XVI. The conclusion that can be arrived at, on the basis of above evidence, is that there is no large amount of agreement between the three groups of student teachers in assigning the ranks to the 16 personality factors and there may be obviously reasons for this phenomenon.

(ii) An attempt was made to find out the rank order correlation between the Sixteen Personality Factors for the three groups of student teachers. It may be recalled that the ranking was done on the basis of the magnitude of the raw scores means. Two groups at a time were taken for the calculation of the rank order correlation. Rhos for different groups are given in Table 10.

Contd.

Table 10

Rank Order Correlation Between Three Groups
of Teachers on Cattell's 16 PF Test

S.No.	Groups compared	rho	P
1.	Science and Commerce Student Teachers	0.862	.01
2.	Science and Arts Student Teachers	0.592	.05
3.	Arts and Commerce Student Teachers	0.600	.05

It is apparent from the above Table that while there is a significantly high agreement between Science and Commerce student teachers, there is not that high degree of agreement between Science and Arts student teachers and Arts and Commerce student teachers in ranking of the 16 factors of the Sixteen Personality Factor Questionnaire. But the conclusion is implicit that there is no perfect correlation between the rankings and that is as it should be.

Analysis of Variance

In earlier pages the concept of the analysis of variance and its viability for use in this study was discussed in brief and needs, perhaps, no repetition. The analysis of variance was used to compare the personality structures of the three groups of student teachers, specialising in the methodology of the teaching of Science, Arts and Commerce

subjects at the B.Ed. level. The t -test was used to test the significance of the differences between any two groups on each of the sixteen personality factors which indicated significant F -ratios. The F -ratios and the t -tests for all the sixteen factors for the three groups of the student teachers are presented in Appendix D (Tables XXV through XL). However, the following Table 11 gives a summary of the Means, S.D.'s and F -ratios on the 16PF scales for the three groups of Science, Arts and Commerce student teachers only.

Table 11 indicated that the three groups of student teachers were significantly different on seven of the sixteen factors assessed by the 16PF Questionnaire. The seven factors are : A (Reserved Vs. Outgoing); C (Less Stable Vs. More Stable); H (Shy Vs. ~~Vs~~ Adventurous); L (Trusting Vs. Suspicious); M (Practical Vs. Imaginative); Q_1 (Conservative Vs. Experimenting) and Q_2 (Group Dependent Vs. Self-Sufficient).

Table 12 through 14 contain the summary of the various t -tests combinations for those factors with significant F -ratios for the groups of Science-Arts, Science-Commerce and Arts-Commerce student teachers.

A study of the Table 12 indicated that Science and Arts teachers differed on six of the sixteen personality factors : A (Reserved Vs. Outgoing); H (Shy Vs. Venturesome); L (Trusting Vs. Suspicious); M (Practical Vs. Imaginative); Q_1 (Conservative Vs. Experimenting) and Q_2 (Group Dependent Vs. Self-Sufficient).

It is obvious from Table 13 that Science and Commerce student teachers differ on only one factor Viz. A (Reserved Vs. Outgoing).

Again, Table 14 shows that Commerce and Arts student teachers differ on four factors : G (Less Stable Vs. More Stable); H (Shy Vs. Venturesome); L (Trusting Vs. Suspicious) and M (Practical Vs. Imaginative).

Table 11

Summary of Means, Standard Deviations and F Ratios for Raw Scores on 16PF Scales for Three Groups of Student Teachers

16PF	Science Students (N = 60)		Commerce Students (N = 60)		Arts Students (N = 60)		F Ratio
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
A	9.65	3.30	13.01	3.82	12.20	3.72	13.17**
B	6.75	3.23	6.45	2.62	6.06	2.47	1.22 NS
C	13.04	4.46	14.06	4.31	11.78	4.31	5.17**
E	15.31	4.53	15.95	4.64	14.71	4.21	0.33 NS
F	12.87	3.50	13.13	4.09	14.20	3.92	2.50 NS
G	10.40	4.51	11.15	3.49	10.95	4.70	0.43 NS
H	15.70	4.80	15.94	3.53	13.35	4.13	7.37**
I	10.65	3.99	9.35	3.53	9.80	3.88	1.94 NS
L	9.50	4.56	9.56	3.89	11.99	3.45	7.17**
M	9.45	3.64	10.40	3.70	11.90	4.13	5.99**
N	10.15	4.88	9.75	4.19	9.01	3.95	1.10 NS
O	14.39	4.97	13.84	4.88	14.45	5.91	0.20 NS
Q ₁	12.15	4.11	11.14	4.59	9.94	3.69	4.83**
Q ₂	12.25	3.66	11.45	3.61	10.40	3.93	3.69*
Q ₃	11.05	4.01	11.11	4.35	9.93	4.19	0.04 NS
Q ₄	13.75	4.35	13.90	4.39	14.14	4.99	0.22 NS

F *Significant at .05 level

**Significant beyond .01 level

Table 12

Summary of Mean Comparisons of Science and Arts Student Teachers on those 16 Personality Factors with Significant t Ratios

Factor	Mean		t	<u>P</u>
	Science Students (N = 60)	Arts Students (N = 60)		
A	9.65	12.20	3.98	Beyond .01
C	13.04	11.78	1.58	NS
H	15.70	13.35	2.87	Beyond .01
L	9.50	11.99	3.36	Beyond .01
M	9.45	11.90	3.45	Beyond .01
Q ₁	12.15	9.94	3.07	Beyond .01
Q ₂	12.25	10.40	2.64	Beyond .01

Table 13

Summary of Mean Comparisons of Science and Commerce Student Teachers on Those 16 Personality Factors With Significant t Ratios

Factor	Mean		t	<u>P</u>
	Science Students (N = 60)	Commerce Students (N = 60)		
A	9.65	13.01	5.69	Beyond .01
C	13.04	14.06	1.28	NS
H	15.70	15.94	0.31	NS
L	9.50	9.56	0.08	NS
M	9.45	10.40	1.42	NS
Q ₁	12.15	11.14	1.26	NS
Q ₂	12.25	11.45	1.27	NS

Table 14

Summary of Mean Comparisons of Commerce and Arts Student Teachers on Those 16 Personality Factors with Significant t ratios

Factor	Mean		t	P
	Commerce Students (N = 60)	Arts Students (N = 60)		
A	13.01	12.20	1.17	NS
C	14.06	11.78	2.89	Beyond .01
H	15.94	13.35	3.65	Beyond .01
L	9.56	11.99	3.57	Beyond .01
M	10.40	11.90	2.08	.05
Q ₁	11.14	9.94	1.56	NS
Q ₂	11.45	10.40	1.52	NS

More specifically, the following conclusions can be arrived at from Table 12, 13 and 14 :

- (a) Science and Arts Student Teachers
1. Science student teachers are more Venturesome and Trusting than Arts student teachers who are Shy and Suspicious.
 2. Science Teachers are more Experimenting or Radical and Self Sufficient than Arts teachers who are Conservative and Group Dependent.
 3. Arts student teachers are More Outgoing and Imaginative than Science student teachers who are Reserved and Practical.
 4. Science student teachers and Arts student teachers do not significantly differ on Factor C (Less Stable Vs. More Stable).

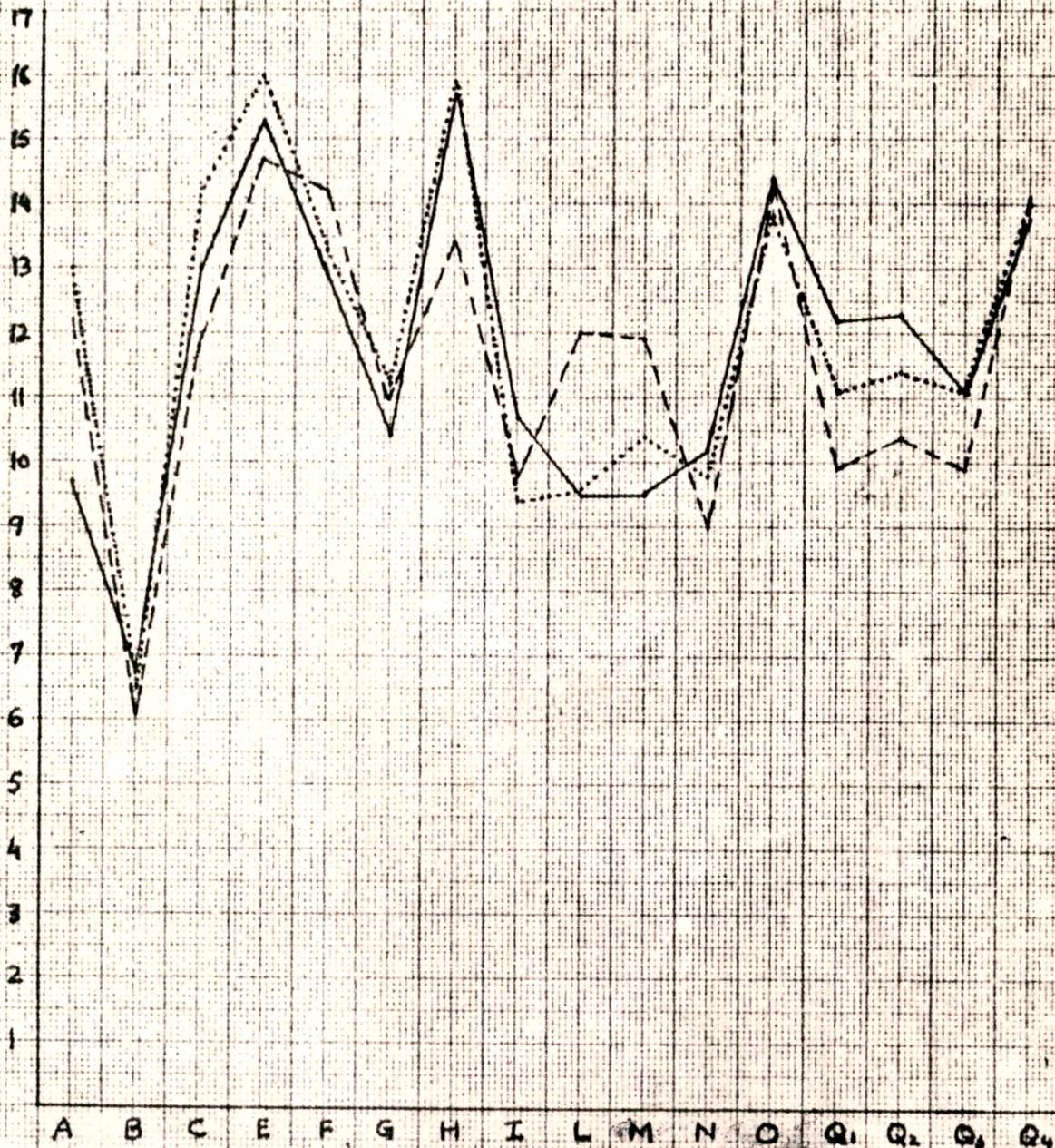
- (b) Science and Commerce Student Teachers
1. Science student teachers and Commerce student teachers are not significantly different on Factor C (Less Stable Vs. More Stable)
 2. Science student teachers and Commerce are not significantly different on Factors H (Shy Vs. Venturesome); L (Trusting Vs. Suspicious) and M (Practical Vs. Imaginative)
 3. Science student teachers and Commerce student teachers are not significantly different on factors Q₁ (Conservative Vs. Experimenting) and Q₂ (Group Dependent Vs. Self-Sufficient).
 4. Commerce student teachers are more Outgoing and Warmhearted than Science student teachers who are Reserved and Critical.

- (c) Arts and Commerce Student Teachers
1. Arts student teachers are more Suspicious and Imaginative than Commerce student teachers who are Trusting and Practical.
 2. Commerce student teachers are More Stable and Venturesome than Arts student teachers who are Less Stable and Shy.
 3. Arts student teachers and Commerce student teachers do not differ significantly on Factor A (Reserved Vs. Outgoing).
 4. Arts student teachers and Commerce student teachers do not significantly differ on Factor Q₁ (Conservatism Vs. Experimenting) and Q₂ (Group Dependent Vs. Self-Sufficient).

The raw score means of the 16PF test were plotted in Figure II. The graphical representation of the data, as shown here, clearly demonstrates an overlapping of the 16PF scales where there were no significant ± differences between the three

FIGURE II

16 PF PROFILE OF SCIENCE, ARTS AND COMMERCE STUDENT TEACHERS



— Science Student Teachers
- - - Arts Student Teachers
... Commerce Student Teachers

groups of student teachers. Contrary to this there were sharp differences reflected in the three curves where there were significant \pm differences. This representation, thus, lends further support to the results arrived at.

Discussion

It was Ryans (1960), who on the basis of the data assembled by the Teacher Characteristic Study, suggested that the combination of personal and social characteristics was not identical either for elementary and secondary school teachers or teachers of different subject matter. It has been an important assumption in this study that the personality characteristics of teachers and student teachers, teaching different specialities, differ to a great degree. This assumption is further reinforced by McLain's (1968) study that "successful teaching in different teaching fields call for personality configuration unique to each field." The evidence presented in the previous Section A of this investigation, by and large, is in agreement with McLain's findings in that Inservice-teachers teaching Science, Arts and Commerce specialisations differ on a measure of personality : Cattell's Sixteen Factor Personality Questionnaire. But is this true in the case of student teachers also?

The conclusions of this study presented above demonstrate that Science, Arts and Commerce student teachers differ considerably on the 16PF test. The Science and Arts student teachers; and Commerce and Arts student teachers differ

on six and four of the sixteen factors, respectively, measured by the 16PF, but the Science and Commerce student teachers differ on only one of the sixteen factors.

The Science students as contrasted to Arts student teachers have the following factor pattern :

A-, H+, L-, M-, Q₁+ and Q₂+

On the other hand the factor pattern of the Arts student teachers when contrasted to Science student teachers is as follows :

A+, H-, L+, M+, Q₁- and Q₂-.

In short it would mean that Science student teachers are reserved, venturesome, suspicious in the sense of being less dogmatic, practical minded and with an attitude of experimentation or radicalism and a fair amount of self-sufficiency and self-dependence. The Arts student teachers are warmhearted, shy, trusting with a degree of imagination. But they are group dependent also.

The above factor pattern for Science student teachers would suggest a picture of (A-, Q₁+ and Q₂+) marked creativity. Students who have taken up the study of Science and its teaching are critical, prepared to stand by their ideas, and judge things in an objective frame of reference. It is not an abnormality certainly but "a temperamental inclination to be cautious in emotional expression" (Cattell Handbook, 1976 p.81). They are not for sure, devoid of a capacity to respond emotionally but have "strong artistic and sentimental interests"

Cattell (1957, p.193), in short H+. With Q_1+ they are characterised by an attitude of radicalism or revolt (not in the political sense) against the crust of custom and tradition sanctified by age and custom. With Q_2+ they are resolute and accustomed to make their own decisions. They will work alone rather than in a group/committee and do actions others might consider odd. In group behaviour "high Q_1 's are voted poorly integrated in the group" and "high Q_2 's show over criticism and pessimism about group actions but are not rejected" (Cattell, Handbook, 1976, p.81). Again these student teachers are less dogmatic and less close minded, more understanding and permissive. As Science students they are practical and have "down to earth" concerns.

The picture that emerges for the Arts student teachers is that they are warmhearted, ready to cooperate, and prepared to go along the current. They enjoy social recognition. "There is evidence", writes Cattell (Handbook, 1976, p.81), "that collections of A+ persons are "natural joiners." They are prepared to compromise with human failings." With Q_1- , the Arts student teachers are prepared to take things for granted and have a conservative attitude respecting the ideas sanctified by ages and, perhaps by sages. They are prepared to follow social change and consolidate it also whether it has been brought by "ballots or bullets." With Q_2- they are group dependent and sound followers." " Q_2 is a central primary in invia (extraversion) (Cattell, Handbook, 1976, p.105). They are jealous, dogmatic, dwelling on frustrations and irritable.

They feel that "children should show more respect for their elders (L+) (Handbook, p.252). The difference in H, it may be noted, is sizable. It is, perhaps, instructive to note Cattell's (1957, p.130) description of a low H person : "his greater conscientiousness application to school work and regard for authority are part of the tendency to more fearful reactivity i.e. of the belief that 'life is serious', so lacking in (H+) (high H) person." They are, however, more interested in Art, Theory and Basic Beliefs.

Cattell (Handbook, 1976, p.116) on the basis of second-stratum factors measured by 16PF test has shown that A-, I- and M- (for males) demonstrate Pathemia Vs. Cortertia (an abbreviation for the cortical alertness). It can be concluded that the Science student teachers are characterised some what by cortertia which shows alertness and readiness to handle problems at a cognitive, objective level. Whereas those at the pathemic pole (as in the case of Arts student teachers here) operate at the mood level, mainly frustration and depression. Hence the observation of Cattell (Handbook, 1976, p.119) "low scoring (pathemic) individuals show a tendency to feel ~~an~~ rather than think." It needs to be noted, however, that there is a clear absence of the factor I-. Perhaps, considering the nature of the two disciplines Science and Arts, Science has more to do with thinking rather than with feeling and the results are as they should be.

Concerning the general group differences (recognizing the limitations of the sample and other constraints) it could be

said that there is a tendency for Science Versus Arts dichotomy to reflect self-sufficient radicalism and independence versus group dependent and subdued conservatism.

The Commerce student teachers as contrasted to Arts student teachers have the following factor pattern :

C+, H+, L- and M-.

On the other hand the factor pattern of Arts student teachers, when contrasted to Commerce teachers, is C-, H-, L+ and M+. It would mean that Commerce student teachers are emotionally stable, assertive, trusting and practical while Arts student teachers are affected by feelings, humble, suspicious, and imaginative.

The picture that would emerge from the above factor pattern for the Commerce teachers is one of higher ego-strength, emotional maturity, not annoyed by things and people, nor dissatisfied with the world. In short, Browning is correct for them : "God in His Heavens and all is right with the world." The Commerce student teachers are adventurous, responsive, genial and carefree, in short, fear no inhibition by environmental threat, etc. Again they are less dogmatic, openminded, ready to change with "down to earth interests", concerned with immediate interests and issues.

The factor pattern for the Arts student teachers would argue for a picture of instability, easily annoyed with people and dissatisfied with the world situation, family and life. They are shy, "tormented by an unreasonable sense of inferiority" (Cattell, Handbook, 1976, p.91). They are, again, rule

bound, conscientiousness, applying themselves to school work and have a regard for authority. They are in the habit of dwelling on frustrations and are close minded. They are, however, more absorbed in ideas, interested in Art, Theory and Basic Beliefs.

Cattell, (Handbook, 1976, p.116) on the basis of second stratum factors measured by the 16PF test, has shown that C-, H-, L+, C+, Q₃- and Q₄+ are characterised by Anxiety. There is a significant mean difference between the Commerce and Arts student teachers in C-, H- and L+ but an actual inspection of the Mean Tables LII - LIV Appendix E clearly show that the Arts student teachers have higher means on O, less on Q₃ and more on Q₄ (though the difference is not significant statistically). This would make one to make a cautious observation in that the Arts student teachers are somewhat more anxiety ridden than the Commerce student teachers. And this is in agreement with the observations made in the preceding paragraphs.

Since Science student teachers and Commerce student teachers differ on only one factor, viz A. There needs to be no great discussion to prove the obvious that under the conditions of this study the two groups do not have any marked personality differences, by and large. Though it does look puzzling but it needs further verification on larger samples.

In the end it is important to bear in mind that since no steps were taken to insure that each group studied

was actually representative of a larger section of student teacher population in the three fields, one is not in position to generalize from the present results on the mean scores, however, suggestive they might be.

SECTION C

TEACHERS AND STUDENT TEACHERS :
A COMPARISON OF PERSONALITY FACTORS

"Discussion of the teachers' personality", writes Heddendorf, (1971), "has been concerned with the question of whether the dominant personality of the teacher is formed prior to or after having acquired some teaching experience". Some would believe that after having taught for some time the teacher develops a somewhat aloof and dignified manner. But a reasonable hypothesis seems to be that it is not only the interaction, extending over a period of time, between the teacher(s) and students and the influences wrought by public expectations and school environment or what Jackson and Guba (1957) called a personality change brought about by institutional pressures of the teaching role, that characterize the personality structure of the teacher(s) but also inborn or the "unlearned", (Ryans, 1960), personal characteristics that manifest as personality structures. If the above stand is considered tenable then it would be, perhaps, in order to hypothesize that inservice teachers and the fledgelings would present differences on a measure of personality : the Cattell's Sixteen Factor Questionnaire.

An attempt would be made in this section to present evidence relating to the one following significant question :

Are there any significant differences between the inservice teachers and preservice teachers of the various teaching fields, viz., Science, Arts and Commerce, on a measure of personality?

(i) Rank Order of Personality Characteristics of Teachers and Student Teachers

In order to make a quick and superficial comparison of the total samples of inservice teachers and student teachers; Science teachers and Science student teachers; Commerce teachers and Commerce student teachers and Arts teachers and Arts student teachers with each other, an attempt was made to rank all the sixteen personality factors (16PF) from highest to lowest for the each of the above groups on the basis of the mean scores of each factor. The relative positions of different factors thus obtained are presented in Tables 15 through 18.

Teachers Vs. Students

An inspection of Table 15 reveals that factor H (Shy Vs. Venturesome) has been given I rank by both the teachers and student teachers. The teachers have awarded II rank to Factor C (Affected by Feelings Vs. Emotionally Stable) while student teachers have placed this factor at VI rank. The student teachers have given III rank to Factor O (Placid Vs. Apprehensive), but the teachers have given Factor E (Humble Vs. Assertive) as the III rank. While the teachers have given Factor A (Reserved Vs. Outgoing) the IV rank, the

Table 15
Rank Order of 16 PF for Total Teachers
and Total Student Teachers

Rank	Teachers (N = 180)	Students (N = 180)
I	H (16.09)	H (15.01)
II	C (15.40)	E (14.90)
III	E (13.10)	O (14.22)
IV	A (12.44)	Q ₄ (13.99)
V	F (12.11)	F (13.42)
VI	N (11.71)	C (13.09)
VII	Q ₄ (11.57)	A (11.64)
VIII	M (11.04)	Q ₂ (11.37)
IX	G (11.03)	Q ₁ (11.18)
X	Q ₁ (10.92)	Q ₃ (11.02)
XI	Q ₃ (10.59)	G (10.87)
XII	O (10.33)	M (10.60)
XIII	Q ₂ (10.29)	L (10.36)
XIV	I (10.26)	I (9.94)
XV	L (8.56)	N (9.36)
XVI	B (7.52)	B (6.11)

Table 16
Rank Order of 16 PF for Science Teachers
and Science Student Teachers

Rank	Science Teachers (N = 60)	Science Student Teachers (N = 60)
I	H (16.00)	H (15.70)
II	C (15.29)	E (15.31)
III	E (14.59)	O (14.39)
IV	Q ₂ (12.67)	Q ₄ (13.75)
V	N (12.60)	C (13.04)
VI	Q ₁ (12.25)	F (12.87)
VII	Q ₄ (11.23)	Q ₂ (12.25)
VIII	G (11.05)	Q ₁ (12.15)
IX	M (10.75)	Q ₃ (11.05)
X	Q ₃ (10.51)	I (10.65)
XI	A (10.37)	G (10.45)
XII	F (10.00)	N (10.15)
XIII	O (9.95)	A (9.65)
XIV	L (8.55)	L (9.50)
XV	B (8.70)	M (9.45)
XVI	I (8.35)	B (6.75)

Table 17
 Rank Order of 16 PF for Commerce Teachers
 and Commerce Student Teachers

Rank	Commerce Teachers (N = 60)	Commerce Student Teachers (N = 60)
I	H (16.45)	E (15.95)
II	C (15.50)	H (15.94)
III	E (13.99)	C (14.06)
IV	A (13.49)	Q ₄ (13.90)
V	F (12.95)	O (13.84)
VI	N (12.20)	F (13.13)
VII	Q ₄ (11.65)	A (13.01)
VIII	M (11.50)	Q ₂ (11.45)
IX	G (11.45)	G (11.15)
X	Q ₃ (11.03)	Q ₁ (11.14)
XI	O (10.60)	Q ₃ (11.11)
XII	Q ₁ (9.80)	M (10.40)
XIII	I (9.50)	N (9.75)
XIV	Q ₂ (9.07)	L (9.56)
XV	L (8.85)	I (9.35)
XVI	B (7.35)	B (6.45)

Table 18
Rank Order of 16 PF for Arts Teachers and
Arts Student Teachers

Rank	Arts Teachers (N = 60)	Arts Student Teachers (N = 60)
I	H (16.40)	E (14.71)
II	C (15.56)	O (14.45)
III	A (13.76)	F (14.20)
IV	F (13.42)	Q ₄ (14.14)
V	Q ₄ (11.77)	I (13.40)
VI	I (11.21)	H (13.35)
VII	E (10.85)	A (12.20)
VIII	M (10.84)	L (11.99)
IX	G (10.70)	M (11.90)
X	O (10.45)	C (11.78)
XI	Q ₃ (10.15)	G (10.95)
XII	Q ₁ (10.06)	Q ₂ (10.40)
XIII	N (9.40)	Q ₁ (9.94)
XIV	Q ₂ (9.19)	Q ₃ (9.93)
XV	L (8.15)	N (9.01)
XVI	B (6.60)	B (6.06)

student teachers have given it the VII rank. There is a perfect agreement between both the groups in ranking Factor F (Sober Vs. Happy-Go-Lucky) as the V. The teachers have given IV rank to Factor N (Forthright Vs. Shrewd) but the student teachers have placed it at XV rank. The teachers have again given VII rank to Factor Q₄ (Relaxed Vs. Tense) but the students have given it the IV rank. Factor M (Practical Vs. Imaginative) has been given VIII rank by the teachers but the student have given it the XII rank. The teachers have given the Factor G (Expedient Vs. Conscientious) as the IX rank but student teachers have placed it at XI rank. Factor Q₁ (Conservative Vs. Experimenting) has been given X rank by teachers but IX rank by the student teachers. The teachers have given Factor Q₃ (Undisciplined Self-Concept Vs. Controlled) as the XI rank but the student teachers have awarded it the X rank. Factor Q₂ (Group Dependent Vs. Self-Sufficient) has been given XIII rank by the teachers but the students have given it the VIII rank. There is an agreement between the two groups in giving Factor I (Toughminded Vs. Tenderminded) as the XV rank. Factor L (Trusting Vs. Suspicious) has been awarded XV rank by the teacher and the student teachers have given it XIII rank. Both the groups have given Factor B (Less Intelligent Vs. More Intelligent) as the XVI rank. In short there is a close agreement between the ranking of four factors viz. H, F, I and B.

Science Teachers Vs. Science Student Teachers

Inspection of Table 16 shows it clearly that the Science teachers and Science student teachers have given the I rank to Factor H (Shy Vs. Adventurous). The students have awarded Factor E (Humble Vs. Assertive) the II rank but the teachers have placed it at III rank.. Again Factor O (Placid Vs. Apprehensive) has been given the III rank by the students and the teachers have given it XIII rank. Factor Q₄ (Relaxed Vs. Tense) has been given the IV rank by the students but the teachers have given it the VII rank. The students have awarded Factor C (Affected by Feelings Vs. Emotional Stable) as V rank but the teachers have given it II rank. Again, Factor F (Sober Vs. Happy-Go-Lucky) has been given VI rank by the students but the teachers have given it XII rank. Factor Q₂ (Group Dependent Vs. Self-Sufficient) has been given VII rank by the students and IV rank by the teachers. The students have ranked Q₁ (Conservative Vs. Experimenting) as the VIII and the teachers have given it VI rank. The students have given Factor Q₃ (Undisciplined Self Conflict Vs. Controlled) IX rank, but the teachers have given it X rank. Factor I (Toughminded Vs. Tenderminded) has been given X and XVI rank by the students and teachers, respectively. Factor G (Expedient Vs. Conscientious) has been given XI and VIII by the students and teachers, respectively. Factor N (Forthright Vs. Shrewd) has been given XII and V rank by the students and the teachers. The students have ranked Factor A (Reserved Vs.

Outgoing) as XIII and the teachers XI. Both the groups have ranked Factor L (Trusting Vs. Suspicious) as XIV. The students have given M (Practical Vs. Imaginative) XV but the students have given it IX rank. Factor B (Less Intelligent Vs. More Intelligent) has been given the XVI and the XV ranks respectively by students and teachers. Thus it is obvious that there is a close agreement on two Factors H and L between the two groups.

Commerce Teachers Versus Commerce Student Teachers

The Commerce teachers have given I rank to Factor H (Shy Vs. Venturesome) but the Commerce student teachers have ranked it as II. Factor C (Affected by Feelings Vs. Emotionally Stable) has been given II and III rank by teachers and student teachers respectively. Factor E (Humble Vs. Assertive) has been given III and I rank by the teachers and students respectively. The teachers have given Factor A (Reserved Vs. Outgoing) IV rank whereas the students have given it the VII rank. Factor F (Sober Vs. Happy-Go-Lucky) has been awarded V and VI rank respectively by the teachers and the students. Factor N (Forthright Vs. Shrewd) has been given VI and XIII ranks by the teachers and the students. Again Factor Q₄ (Relaxed Vs. Tense) has been given VII rank by the teachers and IV rank by the students. Factor M (Practical Vs. Imaginative) has been given VIII rank by the teachers and XII rank by the students. The teachers and the students have given Factor G (Expedient

Vs. Conscientious) IX rank. Factor Q₃ (Undisciplined Self-Controlled Vs. Controlled) has been given X and XI rank by the teachers and the students. While the teachers have given XI rank to O (Placid Vs. Apprehensive) the student teachers have given it V rank. The teachers have given Q₁ (Conservative Vs. Experimenting) XII rank but the students have given X rank. Factor I (Toughminded Vs. Tenderminded) has been given XIII and XV ranks by the teachers and student teachers respectively. Factor Q₂ (Group Dependent Vs. Self-Sufficient) has been given XIV rank by the teachers and VIII by the students. Factor L (Trusting Vs. Suspicious) has been given XV and XIV ranks by the teachers and student teachers respectively. Factor B (Less Intelligent Vs. More Intelligent) has been given XVI rank by both the groups.

Arts Teachers Versus Arts Student Teachers

A study of Table 18 shows that Factor E (Humble Vs. Assertive) has been ranked I and VII by the teachers and student teachers respectively. Factor O (Placid Vs. Apprehensive) has been given II rank by student teachers and X rank by teachers. Factor F (Stable Vs. Happy-Go-Lucky) has been given III rank by student teachers and IV by the teachers. Q₄ (Relaxed Vs. Tense) has been given IV rank by the student teachers and V by the teachers. Factor I (Toughminded Vs. Tenderminded) has been given V and VI ranks by the student teachers and teachers respectively. While student teachers have ranked H (Shy Vs. Venturesome) VI, the teachers have given

it the I rank. Factor A (Reserved Vs. Outgoing) has been given VII and III ranks by student teachers and teachers respectively. Factor L (Trusting Vs. Suspicious) has been given VIII rank by student teachers and XV by the teachers. Factor M (Practical Vs. Imaginative) has been given IX and VIII rank by the student teachers and teachers respectively. The student teachers have ranked Factor C (Affected by Feelings Vs. Emotionally Stable) X and the teachers have ranked it II. Factor G (Expedient Vs. Conscientious) has been awarded XI and IX ranks by the student teachers and teachers respectively. Factor Q₂ (Group Dependent Vs. Self Sufficient) has been given XII rank by the student teachers and XIV by teachers. However, Q₁ (Conservative Vs. Experimenting) gets XIII and XII rank at the hands of student teachers and teachers respectively. Q₃ (Undisciplined Self Control Vs. Controlled) has been awarded XIV rank by the students but XI by the teachers. Factor N (Forthright Vs. Shrewd) has been awarded XV and XIII rank by the student teachers and teachers respectively, but Factor B (Less Intelligent Vs. More Intelligent) has been ranked XVI by both the student teachers and teachers. The conclusion is obvious that both the groups are in complete agreement with each other on Factor B only.

(ii) Next an attempt was made to find out the rank order correlation between the Sixteen Personality Factors for the four groups of total teachers and total students; Science teachers and Science students; Commerce teachers and Commerce

students and Arts teachers and Arts students. As already noted elsewhere the ranking was done on the magnitude of the raw score means. The rank correlation was done for the four groups taking two at a time. Rhos for different groups are given in Table 19.

Table 19
Rank Order Correlation Between the
Four Groups on Cattell's 16PF Test

S.No.	Groups compared	rho	<u>P</u>
1.	Total Teachers and Total Student Teachers	0.637	.01
2.	Science Teachers and Science Student Teachers	0.553	.05
3.	Commerce Teachers and Commerce Student Teachers	0.747	.01
4.	Arts Teachers and Arts Student Teachers	0.589	.05

It is evident from the above Table that there is a substantial agreement in the ranking of the factors of the 16 PF test between total teachers and total student teachers and Commerce teachers and Commerce student teachers. But the degree of agreement between Science teachers and Science student teachers, between Arts teachers and Arts student teachers the agreement is not that high.

Comparison of Teachers and Student Teachers

The sample of this investigation consisted of 180 inservice and 180 student teachers. The comparison of all the teachers and all the student teachers was done, irrespective of the subject specialization. Accordingly, the comparison for the two groups was done by using the t test (Guilford, 1956). The results of the means, S.D.'s and t ratios are presented in Table 20.

Table 20

Summary of Means, Standard Deviations and t ratios for Raw Scores on 16PF Scales for Total Teachers and Total Student Teachers

Factor	Total Teachers (N = 180)		Total Students (N = 180)		F	t	P
	Mean	S.D.	Mean	S.D.			
A	12.44	3.90	11.64	3.95	1.02	1.92	NS
B	7.52	2.81	6.11	2.59	1.18	4.95	Beyond .01
C	15.40	4.68	13.09	4.47	1.09	4.78	Beyond .01
E	13.10	4.80	14.90	4.90	1.14	3.67	Beyond .01
F	12.11	4.58	13.42	3.96	1.34	2.91	Beyond .01
G	11.03	3.92	10.87	4.30	1.21	0.37	NS
H	16.09	4.17	15.01	4.49	1.16	2.37	.05
I	10.26	4.45	9.94	3.89	1.31	0.73	NS
L	8.56	3.71	10.36	4.22	1.29	4.30	Beyond .01
M	11.04	3.97	10.60	4.01	1.02	1.04	NS
N	11.71	4.31	9.69	4.39	1.03	4.39	Beyond .01
O	10.33	3.74	14.22	5.35	2.05	8.00	Beyond .01
Q ₁	10.92	4.39	11.18	4.11	1.14	0.60	NS
Q ₂	10.29	3.99	11.37	3.84	1.08	2.61	.01
Q ₃	10.59	4.13	11.02	4.26	1.06	0.95	NS
Q ₄	11.57	4.09	13.99	4.55	1.24	5.32	Beyond .01

It is obvious from Table 20 that the two groups differed on ten of the sixteen factors : Viz. B (Intelligence); C (Stability); E (Dominance); F (Surgency); H (Venturesome); L (Suspiciousness); N (Shrewdness); O (Insecurity); Q₂ (Self-sufficiency) and Q₄ (Tenseness).

More specifically the following conclusions can be arrived at from the Table under reference :

1. The inservice teachers are more intelligent and emotionally stable than the student teachers who are less intelligent and affected by feelings.
2. The inservice teachers are more humble and emotionally stable than the student teachers who are assertive and happy-go-lucky.
3. The inservice teachers are more venturesome and trusting than the student teachers who are shy and suspicious.
4. The inservice teachers are more shrewd and placid than the student teachers who are forthright but apprehensive.
5. The inservice teachers are more group dependent and relaxed than the student teachers who are self-sufficient but tense.

And perhaps there may be reasons for the results arrived at.

Discussion

"The realities of control", writes Waller (1967) "do not reside in the theoretical structure of the school, but in the interaction that takes place within that structure." It is then, perhaps, correct to assume that the experienced

teachers and the inexperienced student teachers have two entirely different institutional structures where they have the opportunities to allow the interaction of their personality characteristics - both "learned and unlearned" - to take place. The experienced teachers have achieved some sort of a set and a balance whereas the neophyte is in the process of a struggle in that direction in an entirely different type of an institution. From this, presumably it would be a fair conclusion to draw that the two groups of teachers would present somewhat dissimilar personality configurations unique to themselves.

The conclusions presented above have demonstrated that the inservice teachers and student teachers differ on ten of the sixteen factors of the 16PF. The experienced teachers when contrasted to inexperienced young student teachers have the following factor pattern :

B+, C+, E-, F-, H+, L-, N+, O-, Q₂-, Q₄-

The above factor pattern would argue for a picture that the inservice teachers are intelligent and insightful; emotionally mature, calm and unruffled; but obedient, submissive and dependent. They are sober, slow and cautious with an amount of adventurousness in that they are not shy but like to meet people etc. They are trusting, tolerant and their traits of obedience and submissiveness have taught them, over the years, to accept personal unimportance and, if need arises, be conciliatory. They are shrewd and polished but it should

not be "confused with intelligence" (Cattell, Handbook, 1976, p.100). With L-, it is not surprising that people with N+ have a sort of "survival ethos" (Cattell, 1976) in that they are "kindly tolerant of most people and their failings." They are cheerful, self-confident and given to simple actions; not in a position to work alone but in a group and not to do anything that may seem different from the norm or something odd. They will not avoid working in groups because experience has taught them, perhaps, that their thinking is not well-organized to solve the problems themselves. Finally they are relaxed and composed and "do not take a poor view of the degree of group unity and its orderliness" (Cattell, 1976).

The student teachers as contrasted to inservice teachers have the following factor pattern :

B-, C-, E+, F+, H-, L+, N-, O+, Q₂, Q₄⁺

The picture suggested by the above factor pattern would be that the student teachers are less-intelligent, unable to handle abstract problems, worrying and emotional when frustrated. But they are assertive, independent-minded and unconventional, quick and alert. They are shy, apt to be embittered, dwelling on frustrations, suspicious of interference and dogmatism. Again, they have self-assurance. They are likely to "feel overfatigued from exciting situations", and "feel inadequate to meet the rough daily demands of life" (Cattell, 1976). They feel some sort of self-sufficiency, preferring their own decisions and prepared to work alone with one or two student teachers than a large group. They are

mindless of doing things which may appear odd to others. Finally, they are tense, overwrought and take a "poor view of (presumably in part through their own inner dissatisfaction) of the group unity, its orderliness" (Cattell, 1976, p.108). The tension, once again, may be due to complex "level of situational, environmental frustration and difficulty."

In terms of second order factors the student teachers show considerable anxiety : (C-, H-, L+, O+, Q₄+) though one has to note the absence of only one factor Q₃-. Again, they are somewhat independent as judged on the basis of the second factors : (E+, L+, Q₂+) though H+ and Q₁+ are not present at all. The inservice teachers on the contrary are well adjusted, but somewhat subdued and somewhat intelligent : B+.

Concerning the general group differences the issue seem to center around the polarities of mature, shy, group dependent, submission, on the one hand and somewhat frustrated, anxious, self-sufficient independence, on the other hand. The polarity of the sample inservice experienced teachers compares somewhat favourably with that of Merrill (1960) who described his sample of experienced science teachers as obsequious, eternally patient, meek, and with less achievement and individual drive than other groups. Jackson and Guba (1957) had suggested that the "meek" pattern (or humble subordination) of practicing teachers may be the result of occupational process, or a personality change brought about by the institutional pressures of the teaching role. This is, perhaps, more true in the case of an authoritarian based cultural ethos of India where

subordination is prized above all.

The polarity of the sample inexperienced young student teachers may be due to the objective conditions of the training colleges where there is a premium on conformity rather than on diversity and creativity. The student teachers lacking maturity, are fighting a battle of survival because of subjective evaluations and - particularly in practice teaching procedures, they are considered as faceless members of no significance. Their youthful assertion, independence, unconventionality and self-sufficiency, which otherwise are prize possessions, are not understood properly and consequently appreciated fully. Small wonder that they become emotional, frustrating, tense and lacking in self-assurance. The problem becomes pronounced when young student teachers are not of high intellectual standards that could enable them to analyse the present and find solutions to the complex situations.

Comparison of the Personality Configurations of Teachers and Student Teachers Belonging to Different Teaching Fields

If the observation of Morrison and McIntyer (1973) that "among secondary school specialists, values, interests and abilities tend to reflect the subject taught; student teachers of Science and English, for example, having attributes more in common with research scientists and novelists respectively than with one another" is deemed tenable, then the inservice teachers and prospective teachers of various fields

like Science, Commerce and Arts should have no similarities on a measure of personality. The purpose of this sub-section, more specifically, is to provide evidence relating to the question : what is the extent of agreement / disagreement of the teachers and student teachers of different subject specializations on a measure of personality : Cattell's Sixteen Personality Factor Questionnaire?

The 16 PF was administered, it would be recalled, to 180 inservice teachers and 180 student teachers belonging to Science, Commerce and Arts subjects. Each group of teachers and student teachers in the three areas of specialisation consisted of 60 subjects. The means, standard deviations and t ratios are presented in Tables 21, 22 and 23.

Table 21 indicated that the Science inservice teachers and Science student teachers were significantly different on seven of the sixteen factors measured by the 16 PF test. They were : B (Less Intelligent Vs. More Intelligent), C (Affected by Feelings Vs. Emotionally Stable), F (Sober Vs. Happy-Go-Lucky), I (Toughminded Vs. Tenderminded), N (Forthright Vs. Shrewd), O (Placid Vs. Apprehensive), and Q₄ (Relaxed Vs. Tense).

It is obvious from Table 22 that the inservice Commerce teachers and Commerce student teachers were significantly different on six of the sixteen factors measured by the 16 PF test. They are B (Less Intelligent Vs. More Intelligent), E (Humble Vs. Assertive), N (Forthright Vs. Shrewd), O (Placid Vs. Apprehensive), Q₂ (Group Dependent Vs. Self-sufficient), and Q₄ (Relaxed Vs. Tense).

Table 21

Summary of Means, Standard Deviations and t Ratios on
16PF Scales for Science Teachers and Science Student
Teachers

Factor	Science Teachers		Science Student Teachers		F	t	P
	(N = 60)		(N = 60)				
	Mean	S.D.	Mean	S.D.			
A	10.37	3.39	9.65	3.30	1.06	1.17	NS
B	8.70	2.34	6.75	3.23	1.91	3.82	Beyond .01
C	15.29	4.34	13.04	4.46	1.06	2.78	Beyond .01
E	14.59	4.54	15.31	4.53	1.00	0.86	NS
F	10.80	4.10	12.87	3.50	1.37	4.10	Beyond .01
G	11.05	3.77	10.40	4.51	1.43	0.84	NS
H	16.00	4.13	15.70	4.80	1.35	0.37	NS
I	8.35	3.84	10.65	3.99	1.08	3.19	Beyond .01
L	8.55	3.82	9.50	4.56	1.42	1.23	NS
M	10.75	3.61	9.45	3.69	1.02	1.94	NS
N	12.60	3.44	10.15	4.88	2.01	3.18	Beyond .01
O	9.95	3.69	14.39	4.97	1.81	5.44	Beyond .01
Q ₁	12.25	3.53	12.15	4.11	1.36	0.14	NS
Q ₂	12.67	3.72	12.25	3.66	1.03	0.62	NS
Q ₃	10.51	4.10	11.05	4.01	1.05	0.72	NS
Q ₄	11.23	4.00	13.75	4.35	1.18	3.27	Beyond .01

Table 22

Summary of Means, Standard Deviations and t Ratios on
16PF Scales for Commerce Teachers and Commerce Student
Teachers

Factor	Commerce Teachers		Commerce Student Teachers		F	t	P
	(N = 60)		(N = 60)				
	Mean	S.D.	Mean	S.D.			
A	13.49	3.30	13.01	3.82	1.34	0.73	NS
B	7.35	2.54	6.45	2.62	1.14	2.11	.05
C	15.50	4.91	14.06	4.31	1.30	1.69	NS
E	13.99	4.64	15.95	4.64	1.00	2.31	.05
F	12.95	4.16	13.13	4.09	1.03	0.24	NS
G	11.45	3.86	11.15	3.49	1.22	0.44	NS
H	16.45	3.97	15.94	3.53	1.26	0.74	NS
I	9.50	4.08	9.35	3.53	1.34	0.21	NS
L	8.85	3.65	9.56	3.89	1.14	1.03	NS
M	11.50	4.15	10.40	3.70	1.26	1.53	NS
N	12.20	3.59	9.75	4.19	1.36	3.40	Beyond .01
O	10.60	3.59	13.84	4.88	1.85	4.10	Beyond .01
Q ₁	9.80	4.45	11.14	4.59	1.06	1.61	NS
Q ₂	9.07	3.32	11.45	3.61	1.18	3.72	Beyond .01
Q ₃	11.05	4.00	11.11	4.35	1.18	0.08	NS
Q ₄	11.65	4.32	13.90	4.39	1.03	2.81	Beyond .01

Table 23

Summary of Means, Standard Deviations and t Ratios on
16PF Scales for Arts Teachers and Arts Student Teachers

Factor	Arts Teachers		Arts Student Teachers		F	t	<u>P</u>
	(N = 60)		(N = 60)				
	Mean	S.D.	Mean	S.D.			
A	13.76	3.32	12.20	3.72	1.25	2.40	.05
B	6.60	2.61	6.06	2.47	1.12	1.15	NS
C	15.56	4.43	11.78	4.31	1.06	4.67	Beyond .01
E	10.85	4.39	14.71	4.21	1.09	4.89	Beyond .01
F	13.42	4.61	14.20	3.92	1.38	0.99	NS
G	10.70	3.80	10.95	4.70	1.53	0.32	NS
H	16.40	3.98	13.35	4.13	1.08	4.07	Beyond .01
I	11.21	3.70	13.40	3.62	1.05	3.27	Beyond .01
L	8.15	3.61	11.99	3.45	1.09	5.91	Beyond .01
M	10.84	3.92	11.90	4.13	1.11	1.42	NS
N	9.40	3.54	9.01	3.95	1.25	0.57	NS
O	10.45	3.59	14.45	5.91	2.71	4.44	Beyond .01
Q ₁	10.06	4.00	9.94	3.69	1.18	0.17	NS
Q ₂	9.19	3.55	10.40	3.93	1.23	1.75	NS
Q ₃	10.15	3.89	9.93	4.19	1.16	0.28	NS
Q ₄	11.77	3.89	14.14	4.99	1.65	2.89	Beyond .01

Table 23 revealed that the inservice Arts teachers and Arts student teachers differed significantly on eight of the sixteen factors measured by the 16 PF test. The factors were A (Reserved Vs. Outgoing), C (Affected by Feelings Vs. Emotionally Stable), E (Humble Vs. Assertive), H (Shy Vs. Venturesome), I (Toughminded Vs. Tenderminded), L (Trusting Vs. Suspicious), O (Placid Vs. Apprehensive), and Q₄ (Relaxed Vs. Tense).

More specifically, the following conclusions can be drawn from Tables 21, 22 and 23.

- (a) Science Teachers and Science Student Teachers
1. Science teachers are more intelligent than Science student teachers who are less intelligent.
 2. Science teachers are more emotionally stable and shrewd than Science student teachers who are affected by feelings but are nevertheless forthright.
 3. Science student teachers are more happy-go-lucky and tenderminded than Science teachers who are sober but toughminded.
 4. Science student teachers are more apprehensive and tense than Science teachers who are placid and relaxed.
- (b) Commerce Teachers and Commerce Student Teachers
1. Commerce teachers are more intelligent than Commerce student teachers who are less intelligent.
 2. Commerce teachers are more shrewd than Commerce student teachers who are forthright.

3. Commerce student teachers are more assertive and apprehensive than Commerce teachers who are humble and placid.
4. Commerce student teachers are more self-sufficient and tense than Commerce teachers who are group-dependent and relaxed.

(c) Arts Teachers and Arts Student Teachers

1. Arts teachers are more outgoing than Arts student teachers who are reserved.
2. Arts teachers are more emotionally stable and venturesome than Arts student teachers who are affected by feelings and shy.
3. Arts student teachers are more assertive and suspicious than Arts teachers who are humble and trusting.
4. Arts student teachers are more tense than Arts teachers who are reserved.

The raw score means of the 16 PF test were plotted in Figures III, IV, V and VI. The graphical representation of the data, as shown here, clearly demonstrate an overlapping of the 16 PF scales where there were no \pm differences between the two groups of student teachers and inservice teachers. Contrary to this there were sharp differences reflected in the two curves where there were significant \pm differences.

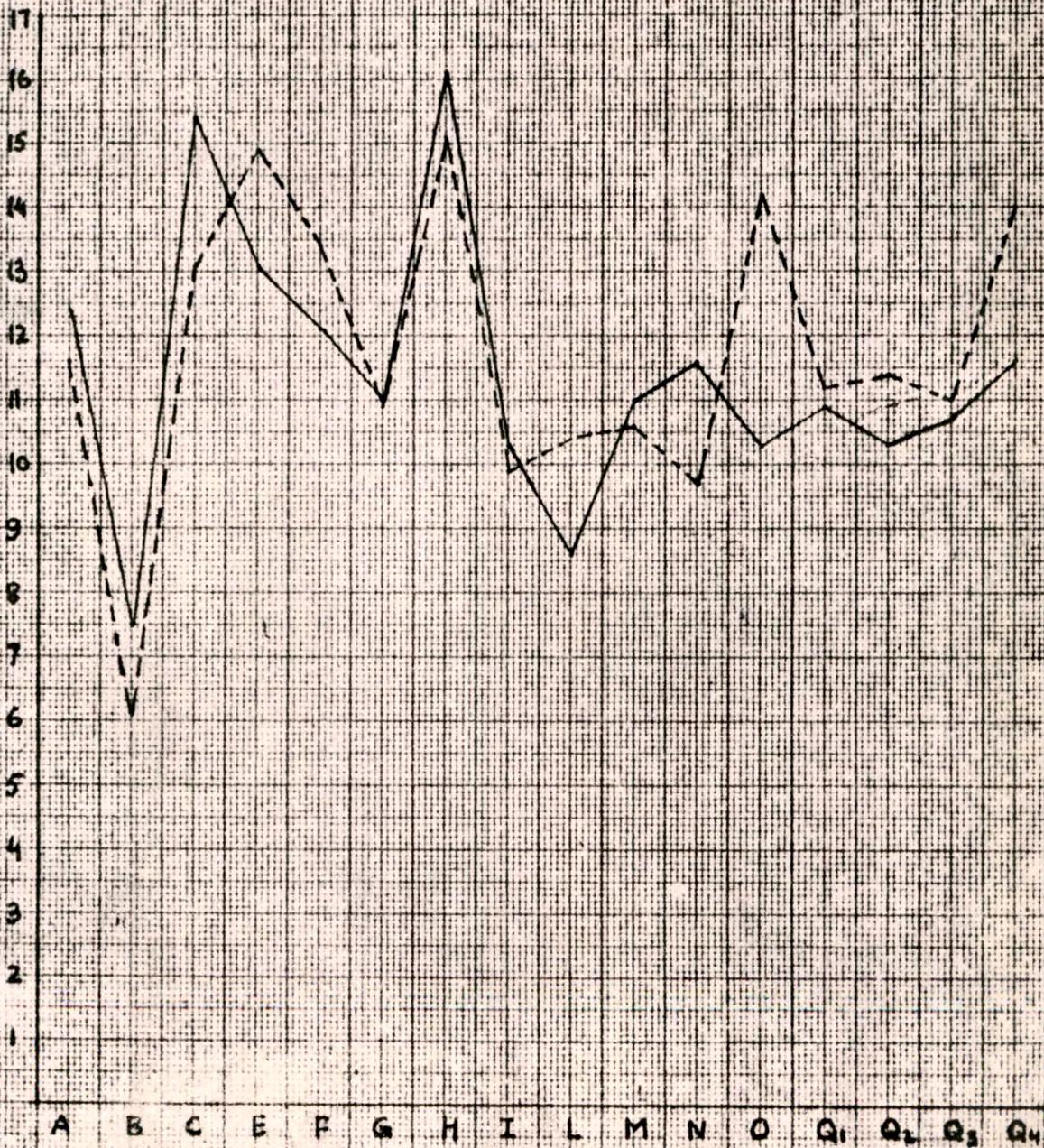
This representation, thus, lends further support to the results arrived at.

Discussion

Waller (1967) has a point when he remarks that "it would be incorrect to assume that teaching inevitably develops

FIGURE III

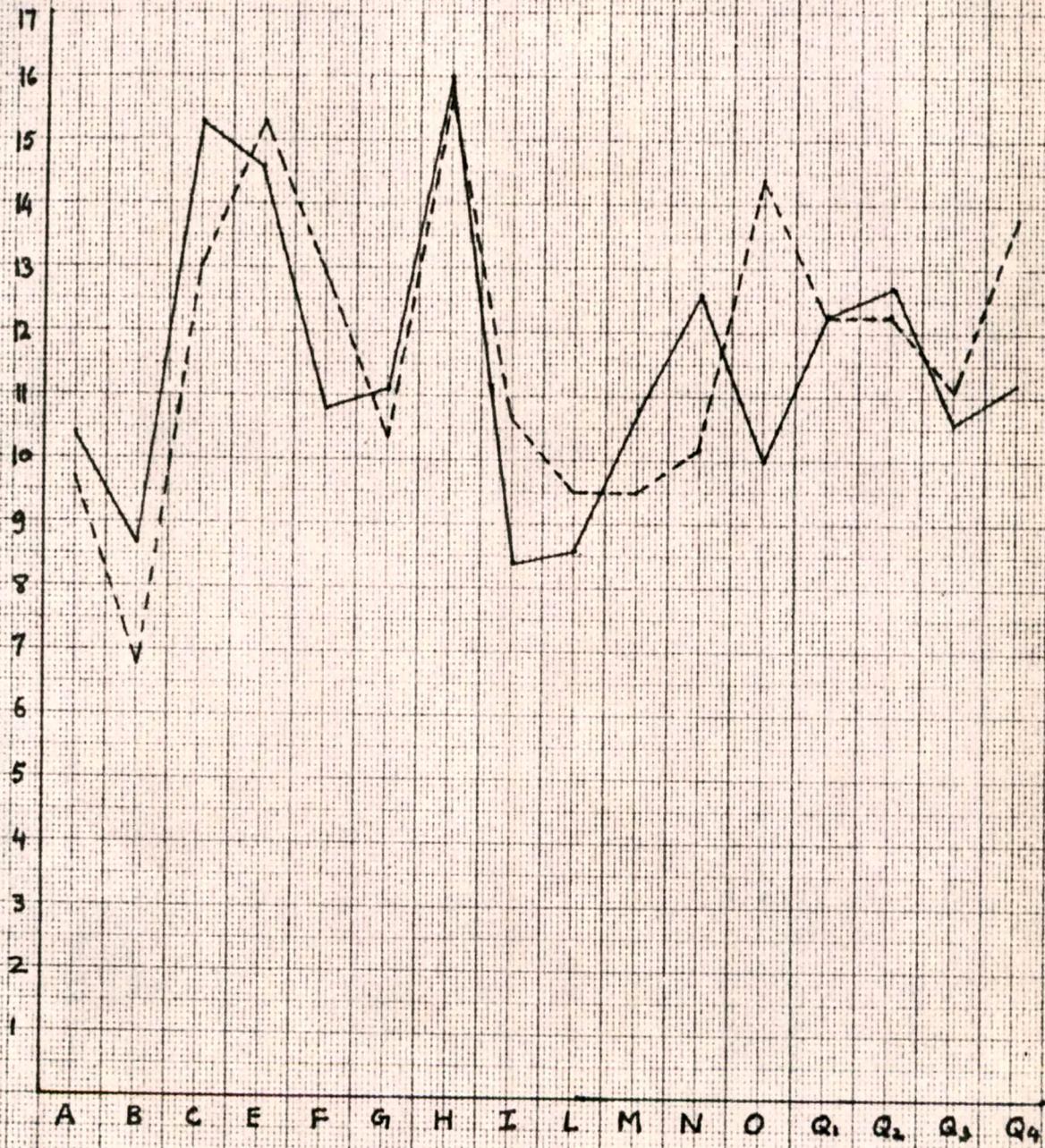
16PF PROFILE OF TOTAL INSERVICE TEACHERS AND TOTAL STUDENT TEACHERS



— Total Inservice Teachers

- - - Total Student Teachers

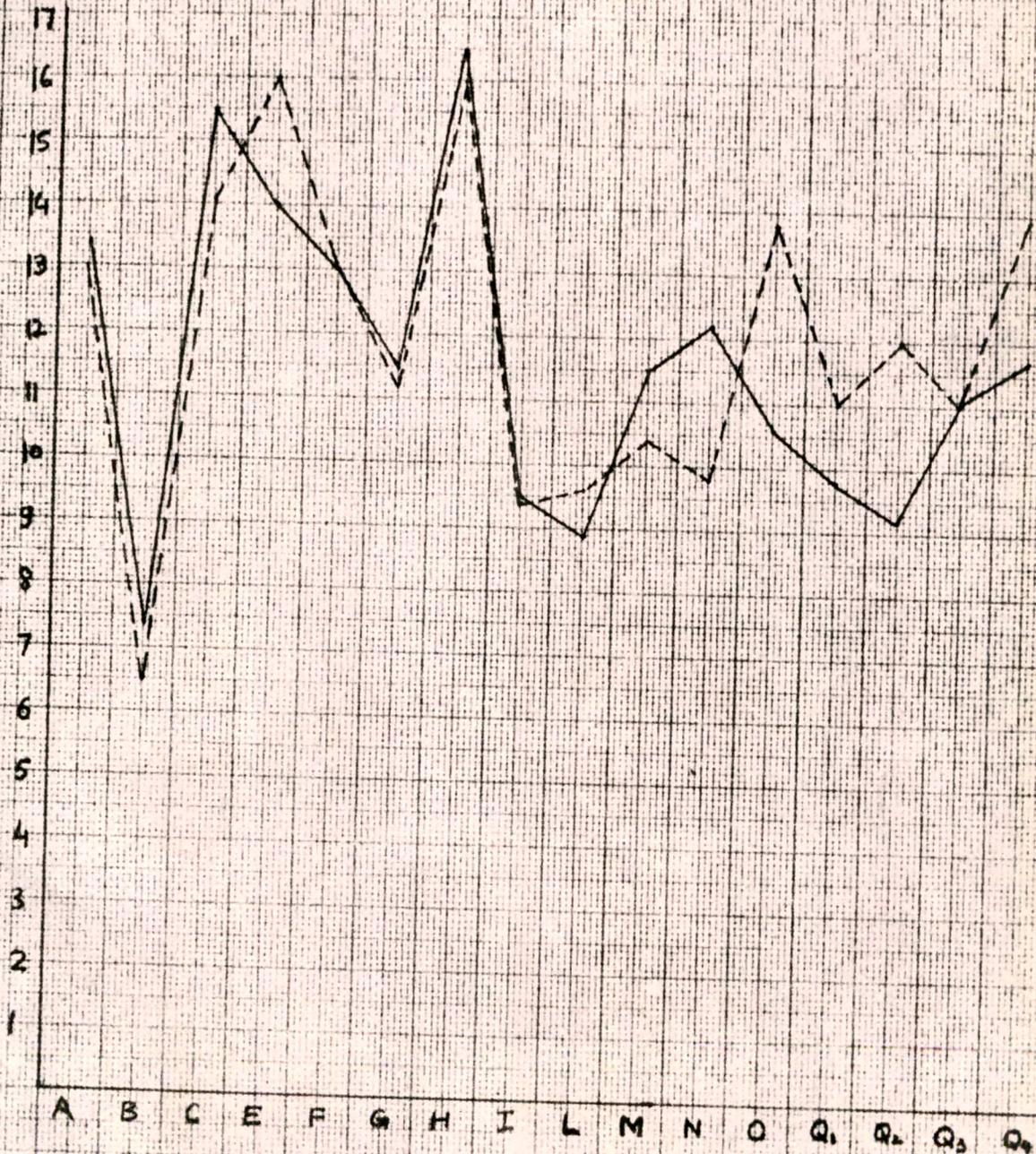
FIGURE IV
 16PF PROFILE OF INSERVICE SCIENCE TEACHERS AND SCIENCE
 STUDENT TEACHERS



— Science Inservice Teachers
 - - - Science Student Teachers

FIGURE V

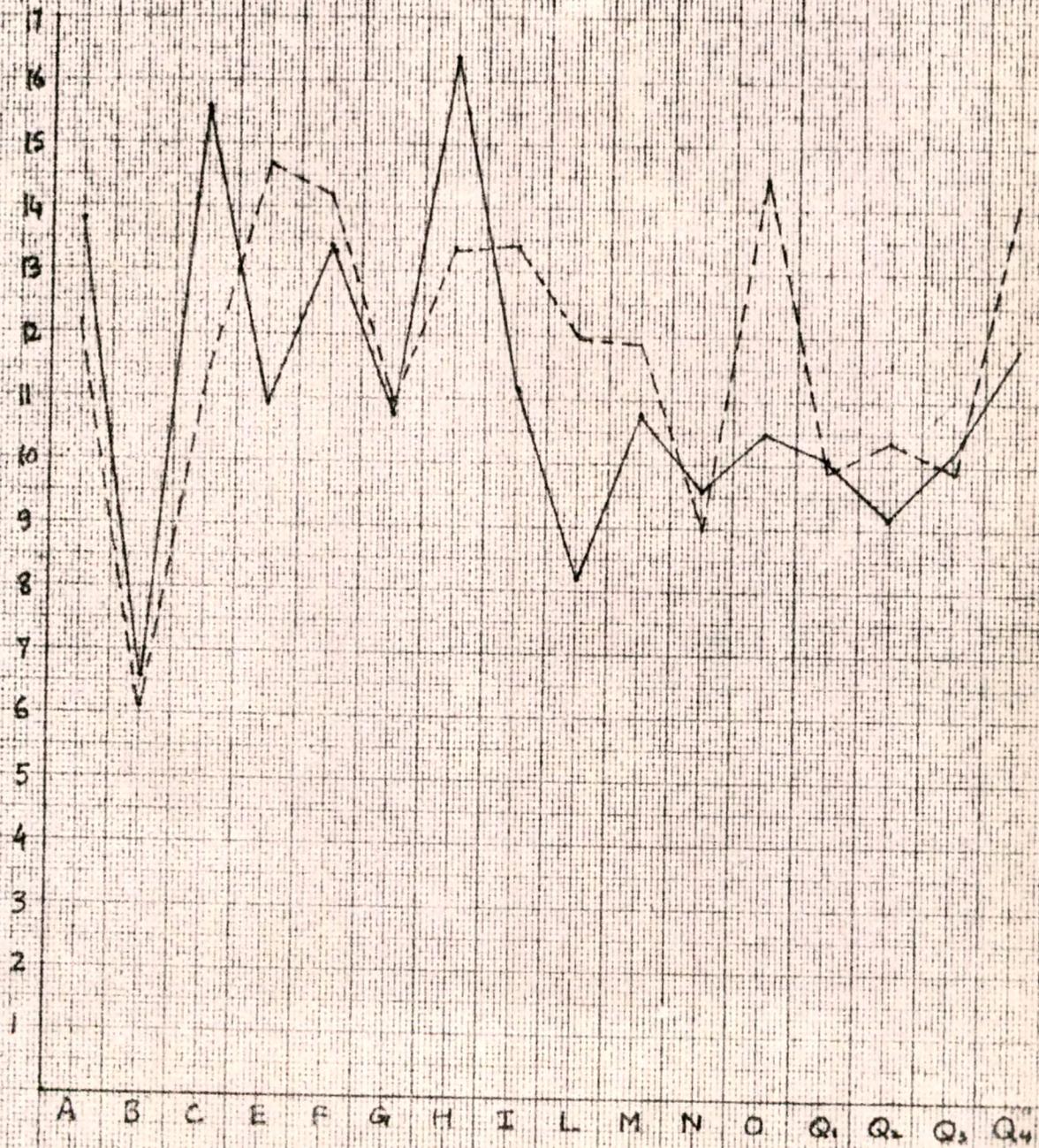
16PF PROFILE OF INSERVICE COMMERCE TEACHERS AND COMMERCE STUDENT TEACHERS



— Commerce Inservice Teachers
- - - Commerce Student Teachers

FIGURE VI

16PF PROFILE OF INSERVICE ARTS TEACHERS AND ARTS STUDENT TEACHERS



— Arts Inservice Teachers

- - - Arts Student Teachers

the same character traits in all teachers." Teaching a particular subject makes the teacher. Between good teaching and bad, it would be agreed, there is a great difference, but none in this that its most pronounced effect is upon the teacher. The occupational patterns of teachers of various specialisations and teaching fields is such that one has to conform his personality to a Procrustean bed. Perhaps, each teaching field and specialisation calls for a distinct personality configuration as was evidenced by the results presented in the previous pages. From these observations it would not be, perhaps, untenable to speculate that there would not be a great degree of agreement between the personality structures of those who are in the teaching profession and those who have not taken to the teaching job itself but are only aspirants at the moment. Is it true in the case of teachers and would be teachers of the various teaching fields studied in this investigation?

(i) The conclusions presented above show that inservice teachers Science student teachers differ on seven of the sixteen factors of the 16 PF. The factor pattern of the inservice Science teachers was B+, C+, F-, I-, N+, O-, Q₄-. This factor pattern would argue for a picture that Science teachers are more intelligent, insightful and intellectually adaptable, emotionally mature, are not easily annoyed by things and people nor the restrictions of life, etc. Again, they are sober and reflective, self-reliant, acting on practical, logical evidence;

shrewd, kindly tolerant of most people and their failings. They are self-confident, not fatigued from exciting situations or worried with fears but composed and relaxed.

The factor pattern for the Science student teachers is : B-, C-, F+, I+, N-, O+, Q₄+. This suggests a picture that the Science student teachers are less intelligent, and of low mental ability; easily perturbed and worried, nevertheless talkative and frank and expecting affection, help and sympathy. They have a blunt trust in human nature and are not skilled enough to analyze the motives, nor alert to manners or to social obligations, worried anxious and depressed easily. Finally they are tense and frustrated. They have an amount of anxiety as Q₄+ is "one of the three highest loaded factors in general anxiety (QII)", (Cattell, Handbook, 1976).

(ii) The Commerce teachers and Commerce student teachers differ on six of the sixteen factors of the 16 PF. The factor pattern of the Commerce teachers is B+, E-, N+, O-, Q₂- Q₄-. Paraphrased, it would mean that the Commerce teachers are more intelligent and insightful; submissive, conventional and conforming; shrewd, kindly, tolerant of most people and their failings. They are self-confident, not fatigued from exciting situations or worried with fears but group dependent with an amount of extra-version because "Q₂- is a central primary in invia (extraversion) second order factor QI", (Cattell, Handbook, 1976). They are relaxed, unfrustrated and composed.

The factor pattern for the Commerce student teachers is B-, E+, N-, O+, Q₂+, Q₄-. This would point to a picture

where the Commerce students are : less intelligent, unable to handle abstract problems but assertive, unconventional and independent-minded. They are unskilled to analyze the motives of others and have a blind trust in human nature and content with what comes. Though they feel apprehensive, insecure and lovely, yet they feel self-sufficient in that they prefer their own decisions. They are tense, overwrought and somewhat anxious. On the basis of second-stratum factors measured by the 16 PF test Commerce student teachers are somewhat independent as evidenced by E+ and Q₂+ which are highly loaded factors in Independence (QIV).

(iii) The results point to the fact that Arts teachers and Arts student teachers differed on eight of the sixteen factors of the 16 PF test. The factor pattern for the Arts teachers was : A+, C+, E-, H+, I-, L-, O-, Q₄-. This would lead to a picture of Arts teachers as : outgoing, warmhearted; submissive, dependable and humble. They are not assailed by a sense of inferiority nor are slow in expressing themselves. Again they are unsentimental with few artistic responses; accept personal unimportance are tolerant and conciliatory, given to simple actions, and are relaxed and composed.

The factor pattern for the Arts student teachers is A-, C-, E+, H-, I+, L+, O+, Q₄+. It would argue for a picture that the Arts students are reserved, prone to sulk; affected by feelings and easily perturbed, in short a worrying type who is annoyed by things and dissatisfied by family life, etc. However, they are independent minded and unconventional, but

shy and withdrawn. They seek affection, attention, help and sympathy but are dogmatic and irritable at the same time. Again they are apprehensive, insecure; tense and fretful.

In terms of second-order factor (QII : Adjustment Vs. Anxiety) the Arts student teachers show considerable overall anxiety (C-, H-, L+, O+, Q₄+) though only one factor viz Q₃- is absent. The teachers, on the other hand, have worked out an adjustment that is at once satisfying.

The conclusion implicit from the above discussion seems to be that there are broad differences in the personality configurations of teachers and student teachers belonging to different teaching specialisations : Science, Commerce and Arts. This is, perhaps, because those who follow certain specialisations are continually thrown into certain kinds of unique situations demanded by the respective fields of specialisations. These situations are best met by a certain kind of reactions on the part of the individual(s). These reactions produce certain shocks or trauma. These shocks or penalties are a means of enforcing conformity to the new demands of the situations. However, the teachers of all the three specialisations studied here have, with their years of employment and regular payments developed a self-assured, cheerful, relaxed and composed attitudes (O-, Q₄-) which, from the point of effective teaching, are the prize possessions of the profession.

9 / For all the student teachers a possible, but speculative explanation of a high level of anxiety and tenseness (O+, Q₄+) is

would be that they are young adults fighting a battle of survival in their Colleges of Education under authoritarian faculties, as pointed by Raina (1969), and as unemployed persons they have the fear of an exposure to the hazards of making a living in the low paid teaching profession.

SECTION D

COMPARATIVE STUDY OF INSERVICE TEACHERS AND
STUDENT TEACHERS ATTITUDE TOWARDS TEACHING

Introduction

In his writings, Thorndike (1945) observed that, the attitude or set or adjustment of a man is a chief determiner not only of what he thinks and does, but also of what he will become or reject - of what will satisfy or annoy him. More specifically, in the area of teacher education, Cox (1960) stated, "first of all the teacher's attitude will limit in a very real way her progress in learning to teach. It will determine the kinds of modifications that she is willing to attempt in her teaching; energy with which the charges are pursued and the learning that takes place."

Naturally, therefore, the attitudes of teachers - along with teacher personality, creativity and interests have long been the object of study of those interested in understanding teachers and in predicting teacher effectiveness. In pursuing this particular line of enquiry, it is assumed either implicitly or explicitly that a teacher's personality, creative abilities and attitudes will effect his behaviour and in turn make their mark on the pupil. It is, therefore, emphasized that increased attention may be devoted to the attitude changes during the preparation process, as well as those occurring after the completion of the professional

training when the student teachers become fullfledged teachers as regular members of the profession.

But it may be pointed that the studies of non-cognitive factors of teacher behaviour still have not yielded consistent results. This may be due both to between - and within - subject variations and to the variety of measurement techniques (Cook, LeBold and Linden, 1963; Linden and Kathryn, 1964; Allen, 1968; Bledsoe and Crafton, 1968).

Performance of Inservice Teachers
and Student Teachers on the Minnesota
Teacher Attitude Inventory (MTAI)

In the light of the unsettled state of art referred to above, it was decided to study the attitude towards teaching of inservice teachers and student teachers. Specifically, as stated in Chapter I, it is the purpose of this section to determine whether differences in attitude towards teaching exists (1) between total sample of teachers and student teachers, (2) between inservice teachers of Science, Arts and Commerce, (3) between Student teachers of Science, Commerce and Arts, and (4) between Inservice teachers and Student teachers when dichotomised on the basis of subject specialisations.

The Minnesota Teacher Attitude Inventory (MTAI) by Cook, Leeds and Callis (1951) was administered to 180 inservice teachers and 180 student teachers specializing in the teaching of Science, Arts and Commerce subjects. Each group consisted of 60 subjects. The Means, Standard Deviations and t ratios of all the group compositions referred to above are presented in Table 24 through 33.

Table 24

Means, Standard Deviations and t ratios of Inservice Teachers and Student Teachers on Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Inservice Teachers	180	97.37	14.89			
Student Teachers	180	106.40	16.17	1.18	5.51	Beyond .01

Table 25

Means, Standard Deviations and t ratios of Inservice Science and Arts Teachers on Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Inservice Science Teachers	60	96.00	16.00			
Inservice Arts Teachers	60	98.33	14.28	1.26	0.83	NS

Table 26

Means, Standard Deviations and t ratios of
Inservice Science and Commerce Teachers on
Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Inservice Science Teachers	60	96.00	16.00			
				1.16	0.20	NS
Inservice Commerce Teachers	60	97.84	13.27			

Table 27

Means, Standard Deviations and t ratios of
Inservice Arts and Commerce Teachers on
Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Inservice Arts Teachers	60	98.33	14.28			
				1.45	0.70	NS
Inservice Commerce Teachers	60	97.84	13.27			

Table 28

Means, Standard Deviations and t ratios of
Science and Arts Student Teachers on
Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Science Student Teachers	60	114.50	12.53			
				1.51	4.52	Beyond .01
Arts Student Teachers	60	102.80	15.39			

Table 29

Means, Standard Deviations and t ratios of
Science and Commerce Student Teachers on
Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Science Student Teachers	60	114.50	12.53			
				1.64	4.98	Beyond .01
Commerce Student Teachers	60	101.30	16.06			

Table 30

Means, Standard Deviations and t ratios of
Arts and Commerce Student Teachers on
Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Arts Student Teachers	60	102.80	15.39			
				1.09	0.52	NS
Commerce Student Teachers	60	101.30	16.06			

Table 31

Means, Standard Deviations and t ratios of
Inservice Science Teachers and Science Student
Teachers on Minnesota Teacher Attitude
Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Science Teachers	60	96.00	16.00			
				1.63	6.98	Beyond .01
Science Student Teachers	60	114.50	12.53			

Table 32

Means, Standard Deviations and t ratios of Inservice Arts Teachers and Arts Student Teachers on Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Arts Teachers	60	98.33	14.28	1.16	1.64	NS
Arts Student Teachers	60	102.80	15.39			

Table 33

Means, Standard Deviations and t ratios of Inservice Commerce Teachers and Commerce Student Teachers on Minnesota Teacher Attitude Inventory (MTAI)

Group	N	Mean	S.D.	F	t	P
Commerce Teachers	60	97.84	13.27	1.47	1.28	NS
Commerce Student Teachers	60	101.30	16.06			

A study of Table 24 indicates that there is a significant differences between, total inservice teachers and total student teachers on the MTAI scores. The mean difference of 9.03 in the MTAI scores is in favour of student teachers : t being significant beyond .001 level of significance.

Inspection of Tables 25, 26 and 27 indicate that between inservice Science teachers and Arts teachers, between inservice Science teachers and Commerce teachers and between inservice Arts teachers and Commerce teachers there are no significant differences at all. The t ratio is less than unity in all the comparisons, uniformly.

Tables 28, 29 and 30 demonstrate that between Science student teachers and Arts student teachers, between Science student teachers and Commerce student teachers, between Arts student teachers and Commerce student teachers, there are no significant differences between Arts student teachers and Commerce student teachers only. In the first two groupings (Science-Arts and Science-Commerce) the differences are actually large and significant beyond .001 level of confidence. The gain in scores is in favour of Science student teachers in both the comparisons.

A study of Tables 31, 32 and 33 indicate that out of the three sub-group comparisons : inservice Science teachers - Science student teachers; inservice Arts teachers - Art student teachers and inservice Commerce teachers - Commerce student teachers, it is only the first sub-group (inservice Science

teachers - Science student teachers) that yielded a t ratio significant beyond .001 level of significance. The Science student teachers have a significant edge over the inservice Science teachers.

The overall comparison of various groups of inservice teachers and student teachers have been made by plotting Ogives of scores on Minnesota Teacher Attitude Inventory (MTAI). They have been plotted in Figures VII through XII. Some interesting observations can be made from the various figures.

In Figure VII the Ogives for total inservice teachers and total student teachers have been plotted for MTAI raw scores. The Ogive representing the student teachers lies markedly to the right to that of total inservice teachers, thus indicating that there are differences in the performance of total inservice teachers and total student teachers on the MTAI scores.

In Figure VIII all the Ogives almost converge indicating that there are no differences in the MTAI scores of inservice teachers of Science, Arts and Commerce. Figure IX, which represents Ogives for the student teachers of Science, Commerce and Arts on MTAI, shows that the Ogives of the Science student teachers lies markedly to the right of the Ogives of Commerce and Arts student teachers. The two Ogives for Commerce student teachers and Art student teachers almost converge. This demonstrates that there are differences between the Science student teachers on the one hand and Commerce and Arts student teachers on the other.

FIGURE VII

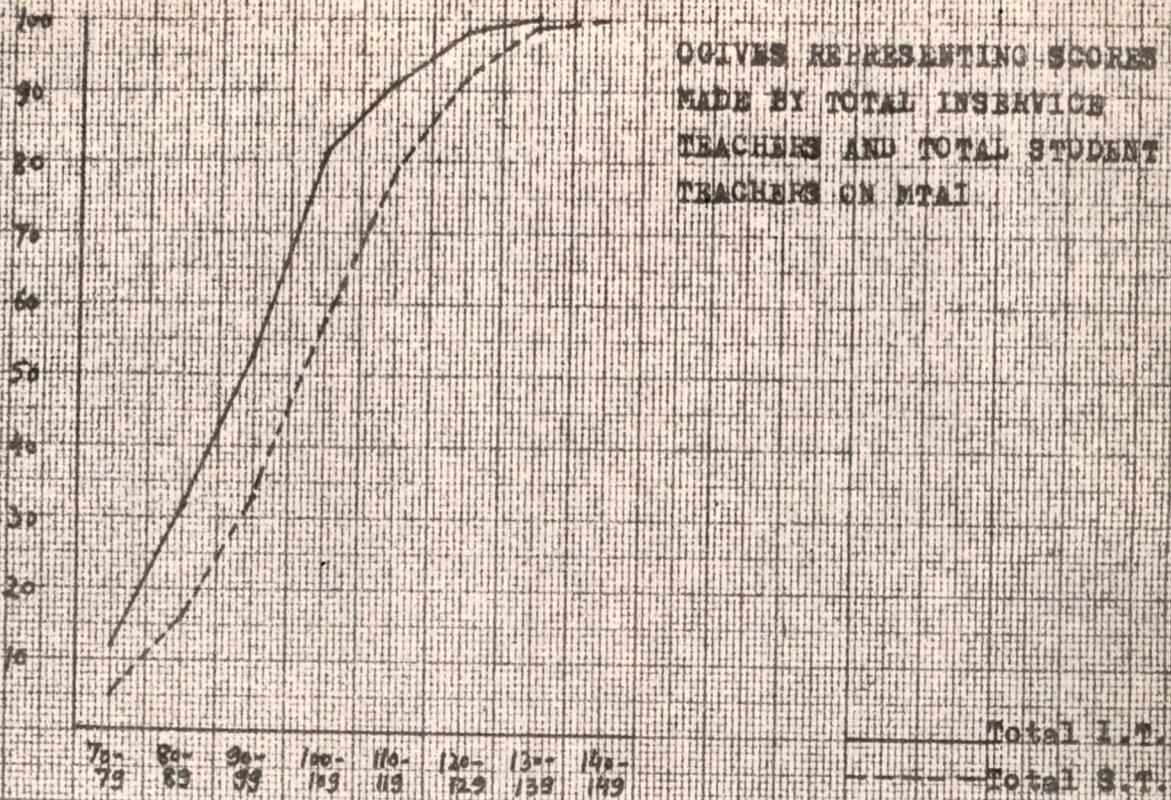


FIGURE VIII

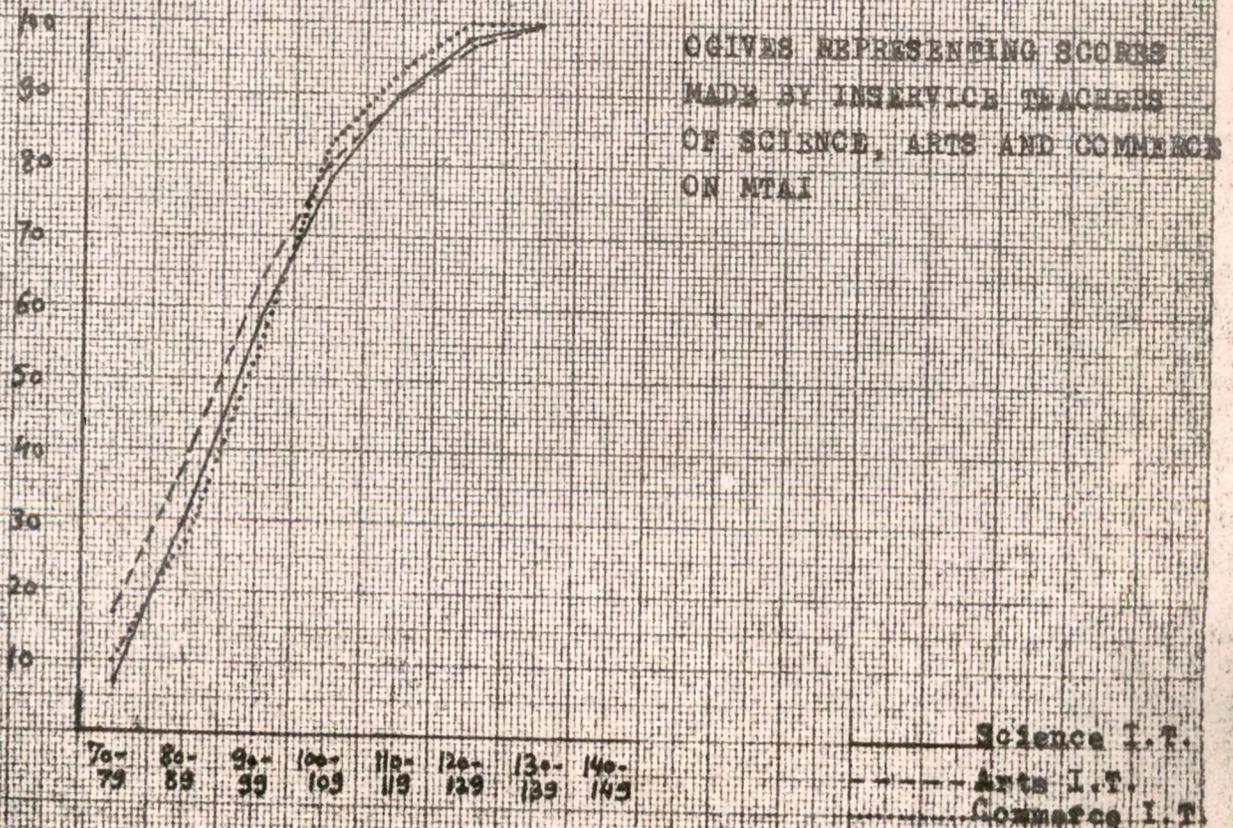
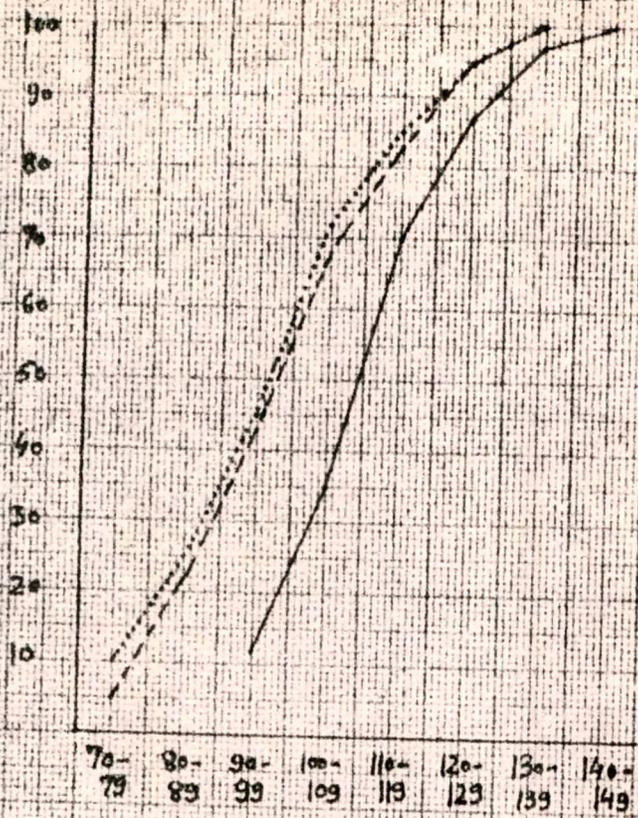


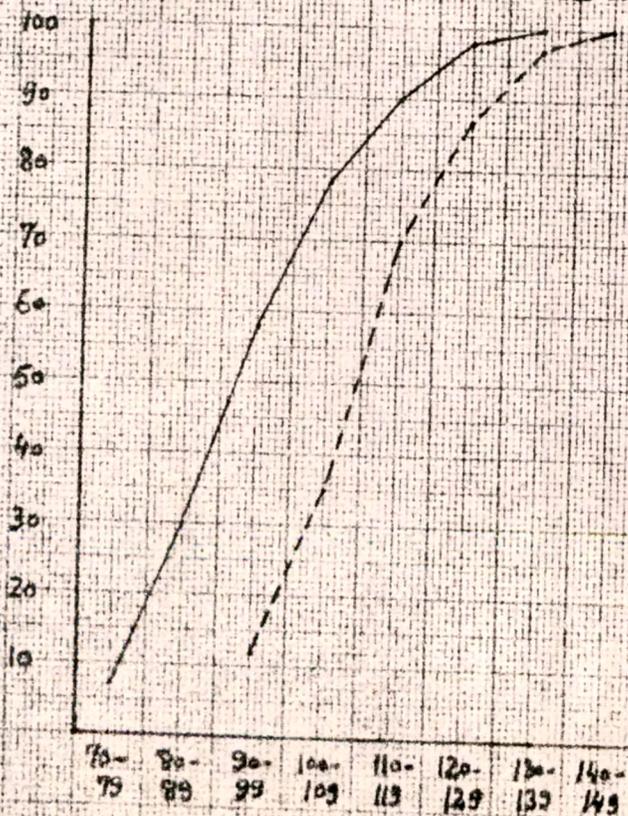
FIGURE IX



OGIVES REPRESENTING SCORES
MADE BY STUDENT TEACHERS OF
SCIENCE, ARTS AND COMMERCE
OF MTAI

Science S.T.
Arts S.T.
Commerce S.T.

FIGURE X

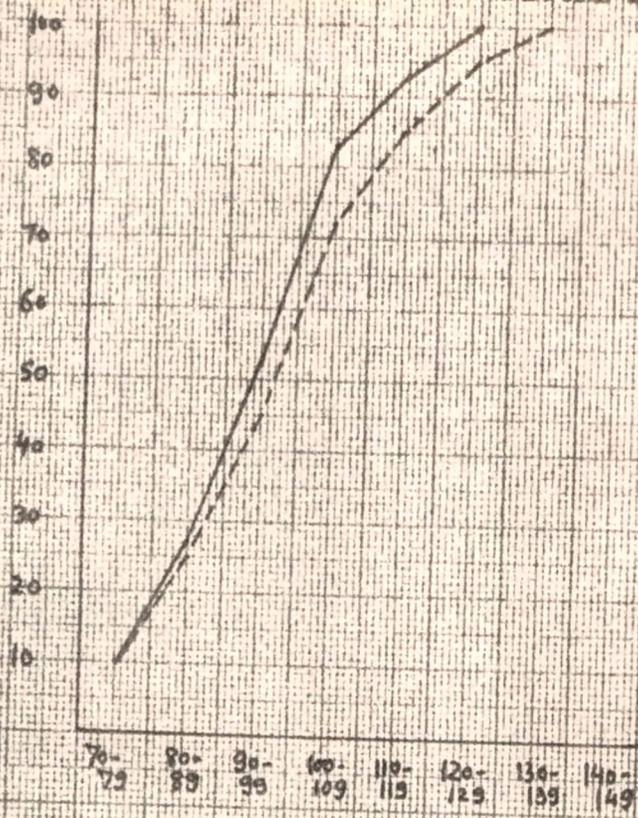


OGIVES REPRESENTING SCORES
MADE BY SCIENCE INSERVICE
TEACHERS AND SCIENCE STUDENT
TEACHERS ON MTAI

Science I.T.
Science S.T.

FIGURE XI

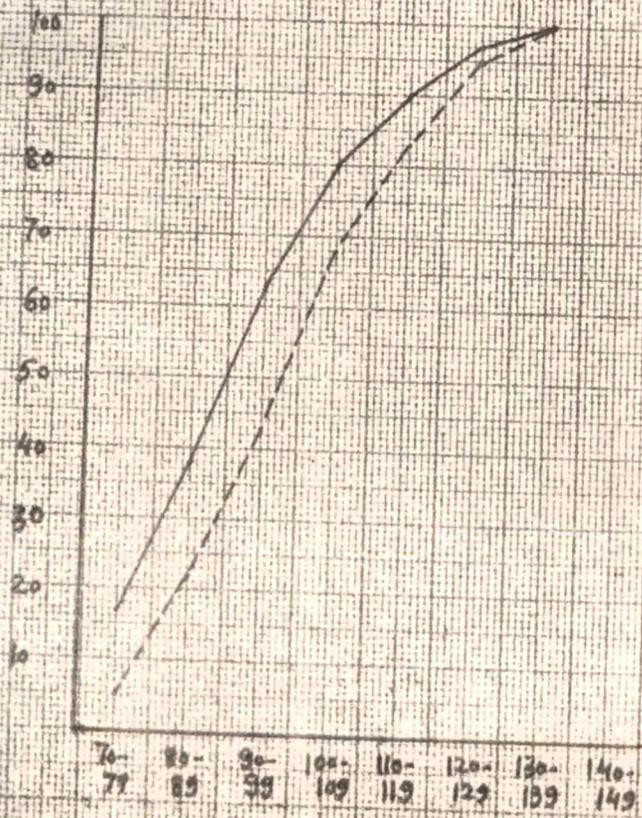
OGIVES REPRESENTING SCORES
MADE BY COMMERCE INSERVICE
TEACHERS AND COMMERCE STUDENT
TEACHERS ON MTAI



— Commerce I.T.
- - - Commerce S.T.

FIGURE XII

OGIVES REPRESENTING SCORES
MADE BY ARTS INSERVICE
TEACHERS AND ARTS STUDENT
TEACHERS ON MTAI



— Arts I.T.
- - - Arts S.T.

In Figure X the Ogives representing scores made by inservice Science teachers and Science student teachers on the MTAI scores have been plotted. The Ogives for the student teachers lies sufficiently to the right of the inservice teachers indicating that there are differences between the performance of the two groups.

In Figures XI and XII the Ogives for inservice Commerce teachers and Commerce student teachers, and Arts inservice teachers and Arts student teachers have been plotted for the MTAI scores. They are very close to each other indicating that there are no significant differences in the scores whatsoever.

Discussion

"By far the most popular instrument" write Getzels and Jackson (1963), "for the measurement of teacher attitudes is the Minnesota Teacher Attitude Inventory (MTAI). A sizeable number of research studies in India and abroad are reported in literature. According to its authors, "it is designed to measure those attitudes of a teacher which predict how well he will get along with pupils in interpersonal relationships, and indirectly how well satisfied he will be with teaching as a vocation" (Cook, Leeds and Callis, 1951).

(i) One of the most important results of this section has been that the student teachers as a group have demonstrated a more favourable attitude towards teaching as compared to those teachers who are well placed in their jobs for some years now.

A normal reasonable expectation would have been the reverse only because the mature, experienced inservice teachers, who have received a degree in education (B.Ed.), are occupationally as well as otherwise well-settled in life. The performance of student teachers, with an uncertain future, struggling against heavy odds and restrictions inside and outside their colleges of education, apparently seem surprising.

Be that as it may be, the more favourable attitude towards teaching on the part of student teachers would mean that they, as a group, are able to maintain a state of harmonious relations with their pupils characterized by mutual affection and sympathetic understanding. They enjoy the teaching job without facing disciplinary problems. They allow a free atmosphere where the pupils can think freely, act and speak their mind with mutual respect for feelings, rights, and abilities of others. The student teachers have a fair amount of humour, justice and honesty. The teaching would be pupil centred; student teachers being mostly engaged in pupil talk and pupil participation in the processes of learning.

On the other hand the comparatively low scores of the total group of inservice teachers would argue for a picture where they attempt to dominate the classrooms, rule with an iron rod, creating an atmosphere of tension, fear and submission. It is possible that they are nervous, fearful and distraught in a classroom characterized by frustration, restlessness, inattention, lack of respect and a host of disciplinary problems. In either case both the teachers and pupils dislike

school work. Ridicule, sarcasm and sharp tempered remarks would be common. The teachers think in terms of their status and infallibility in all matters in the classroom. They emphasize the subject matter to be covered than in terms of pupil needs and other things. They emphasize teacher talk and naturally there would be confusion and lack of pupil participation.

What are the reasons responsible for the more favourable attitude towards teaching scores and comparatively low attitude towards teaching scores on the part of student teachers and inservice teachers, respectively. One is regarding the nature of schooling in the present day schools in Rajasthan. Emphasis is on course coverage in the schools and the pass percentage. Certification of schools, as shown by Wanchoo and Raina (1979) is done by the Board of Secondary Education, Rajasthan, on the basis of examination results. Running and permanent shields are awarded to the deserving schools. It is the top ten schools, on the basis of examination results, that are listed in the Boards publications. The Board also lists the names of the schools whose results are poorer than the pass percentage of private candidates.

This all goes to point to the fact that where the pass percentage is the one and sole criterion of a teacher's competence, the teachers do not need all these 'ideal' training college principles taught to them in the Philosophical and Sociological Basis of Education, Psychology and the Methodology of Teaching their respective subjects of specialisations.

Besides, the schools, as argued by Perry (1969) provide a "second training" where the teachers have to unlearn what they learnt in their teachers colleges. Experience, perhaps, has taught them that these principles do not work in the schools as organized these days.

The training colleges have been opened with the specific purpose that the student teachers would acquire desirable attitudes, habits, skills and ideas towards children and the school-work. The student-teaching experiences with their day to day contact with children and various school problems are sure to influence the value judgements and attitudes of the student teachers favourably. The sample student teachers, who are having their initiation into teaching seem to have been favourably influenced, perhaps, by the exposure to the training colleges campus and off campus programmes and experience. They are not haunted by course coverage or certification on the basis of pass percentage of the students they happen to teach in their cooperating schools.

Whether these student teachers would continue to own these favourable attitude towards teaching, is based more on faith than on empirical evidence. Besides, one limitation to which Loree (1971) has made a mention is that "a person's behaviour and his belief statements may not correspond, the teacher who is very restrictive may report that children should be allowed more freedom in the classroom." However, the results, as presented here on the part of the student teachers, might very well be examined for leads to the development of recruitment

and entrance criteria.

(ii) The next result arrived at regarding the Science, Arts and Commerce inservice teachers is that there are absolutely no differences discernable in their attitude towards teaching. And an explanation seems difficult to speculate. However, in case one is inclined to agree to the conclusion of Rocchio and Kearney (1956) that "apparently, the attitudes measured by MTAI are basic and deeply rooted in the personality of a teacher," then Science, Arts and Commerce, teachers who have demonstrated sharp differences in their personality configurations as measured by Cattell's Sixteen Personality Factor Test, ought to show differences in the extent of their attitudes towards teaching as measured by Minnesota Teacher Attitude Inventory. But it is not so. A plausible explanation that seems tenable, perhaps, is that considering the objective demands the three groups of inservice teachers uniformly, are more pragmatic in forgetting higher objectives of education like the development of the total personality of their pupils in the classroom and concentrating on course coverage.

Perhaps, it may be also due to the fact that the inservice teachers are primarily concerned with their teaching of their special subjects (Science, Arts, Commerce) for a very short duration of a single period in a day. Kearney and Rocchio in an earlier study in 1955 studied the differences in MTAI scores between 587 elementary school teachers who taught all subjects to the same pupils (self-contained class-

rooms) and 52 teachers who taught different pupils in art, home economics, industrial art, music and physical education (specialist classrooms). The respective MTAI scores for the two groups were 41 and 28, differing significantly at .01 level. The investigators explained the findings as follows :

Teachers who have pupils for longer periods during the day are interested not only in the pupil's acquisition of subject matter, but also are concerned with the pupil's whole personality which demands knowledge of the pupil's home background, his physical and mental health, and his outside activities. On the other hand, teachers of "special" subjects think in terms of the subject matter to be covered rather the development of a self-directing personality in their pupils."

Perhaps, this may also be true here in the case of the specialist teachers of Science, Arts and Commerce who constitute the sample of this study. In short, all the inservice teachers, irrespective of subject specialisations, have submitted themselves to what Jackson and Guba (1957) called "institutional pressures."

The third result arrived at regarding the attitude differences is that while Science student teachers have a significant edge over Arts and Commerce student teachers, no such differences exist between Arts and Commerce student teachers. The only plausible explanation seems to reside in the personality configuration of the Science student teachers who have not as yet embarked on a regular teaching assignment in the schools. Therefore, they are not unduly influenced by the 'institutional pressures', (Jackson and Guba, 1957). The

factor pattern of the Science student teachers on Cattell's Sixteen Personality Factor Test is : A-, Q₁+ and Q₂+, which is characterized by marked creativity. The Science student teachers are critical, prepared to stand by their ideas, and doing things in an objective frame of reference. They have an attitude of radicalism/experimentation and are not suffering from hide bound conservatism. They are less dogmatic, and less close minded, more understanding and more permissive. The Science student teachers are characterized by what Cattell calls "Cortertia" which indicates alertness and readiness to handle problems at the cognitive, objective level. They do not suffer from frustrations and depression. They think rather than feel. In short the Science student teachers are characterized by self-sufficient radicalism and independence, and democratic attitudes.

Therefore, it is obvious that the Science student teachers as compared to other groups would be able to maintain a state of harmonious relations with the pupils characterized by mutual affection and understanding. Situations requiring disciplinary actions would rarely arise. The Science student teachers will work with a feeling of security growing from a permissive atmosphere of freedom to think, and act and speak one's mind with mutual respect for the feelings, rights and abilities of others. Both Science student teachers and their students will take nothing for granted, will forge new solutions to difficult situations on an equal partnership basis. The Science student teachers, with a creative approach will not

dominate, condemn, create an atmosphere of tension, restlessness and frustration. There will be no scope for ridicule, sarcasm, sharp tempered remarks or the use of the rod or other forms of brutal punishment. The Science student teacher will think of what the pupils need, feel, know and can do. Therefore, it is not surprising that the Science student teachers have demonstrated ^a favourable attitude towards teaching as compared to other groups. Incidentally, (Raina, 1972) has shown that a negative relationship exists between an authoritarian personality structure as measured by the F-scale (Adorno, et al, 1950) and the MTAI. The Science student teachers with their marked creativity and democratic attitudes have shown better attitudes towards teaching. The lack of any difference between Science student teachers and Commerce student teachers in the MTAI, perhaps, indicates no major personality configuration differences.

(iv) Lastly, the results reveal that it is Science student teachers who have expressed more favourable attitudes towards teaching than the inservice Science teachers. But there is no significant difference between the attitude scores of inservice Arts teachers and Arts student teachers and between inservice Commerce teachers and Commerce student teachers. A reference to personality configuration differential would not be tenable only because in the discussion earlier (i) it was found that the inservice teachers as a group were more pragmatic and being subject to the institutional pressures were

more worried on account of what Rocchio and Kearney (1956) write "subject matter to be covered rather than in terms of what the pupils need, feel, know and can do." Science student teachers are free from institutional pressures and course coverage and naturally as teachers college students, with an exposure to campus and off campus experiences, are likely to express more favourable attitudes as compared to inservice teachers. But the explanation, if tenable, would then show Commerce student teachers and Arts student teachers to have an edge in attitude towards teaching over Commerce inservice teachers and Arts inservice teachers, respectively. But it is not so. In fact there is an absence of any difference between the attitude means of these groups. Though it does look puzzling, it needs further verification on larger samples.

SECTION E

COMPARATIVE STUDY OF THE CREATIVE POTENTIAL
OF INSERVICE TEACHERS AND STUDENT TEACHERS

Introduction

Considerable attention has been devoted by creativity research workers to the identification and development of creative talent in scientists (Taylor and McKeen, 1968), architects, mathematicians, writers, junior through high school students, but the study of creative talent, its identification and development, in no less an important person, the teacher has been profoundly neglected. In fact Yamamoto (1963) and recently Raina (1972) have lamented the paucity of scientific systematic research in this important field. In India it is primarily the artistic personality that has been studied rather intensively. There is no denying the fact that some beginning at the masters and doctoral levels has been made but the field lacks up-to-date, comprehensive and indepth studies. Only studies of limited objectives exist.

Again, Ryans (1960), has stressed the identification of "behaviour styles" and their effect on 'information-transmission' in the field of teacher effectiveness. It is now an established fact (Kendle, 1963) that the creativity potential and divergent thinking are important part of the behaviour styles that effect the process of information-transmission in the classrooms. It should be, therefore, an

urgent concern of research workers and others to devote sustained and vigorous attention to this important field. Besides this there is the warning of Toynbee (1964) that, "if society fails to make the most of this (creativity) asset, or if, worse still, it perversely sets itself to stifle it... man is throwing away his birthright of being the lord of the creation and is condemning himself to be instead, the least effective specimen on the face of this planet."

Performance of Various Groups on
Khatena's Something About Myself(SAM)

Inspite of the fact that some researches on teachers (Raina, 1970; Welberg, 1967; Raina, 1970) and student teachers (Raina, 1970; Goyal, 1973; Samar, 1974) have been reported not much research evidence is available regarding the differences, if any, between inservice teachers teaching various subjects and student teachers with specialisations in different teaching fields like Science, Commerce and Arts, to name a few only. The problem of creativity research is further complicated by a lack of an agreement on the part of research workers on the definitions of creativity and the criteria to be used in the evaluation of creative endeavours. The criterion problem is, perhaps, central to the study of creativity. It is because of an absence of an universally operational definition of creativity and the criterion that there is some sort of contradiction in the results arrived at. Moreover, the nature of creativity depends fundamentally on the culture in which

the creator has grown up. "For example", writes Nash (1966) "no Beethoven could arise among the Australian aborigines, no Shakespear among the Eskimos, no Einstein in New Guinea."

However, there is a remarkable agreement on the fact that all men and women are potentially creative. And this has a hope for mankind and teachers and student teachers especially.

Khatena's Something About Myself (SAM) has three specific advantages that warrants its use in creativity research :

1. it is an autobiographical instrument and has found support in that it is an efficient way of identifying creative talent (Taylor, 1958; Roe, 1963). The use of biographical inventory techniques to predict success in artistic, literary and scientific creativity has been confirmed by (Schaefer and Anastasi, 1968; Anastasi and Schaefer, 1969),
2. it is an easily comprehensible autobiographical checklist which is easy to score,
3. its reliability and validity are satisfactory.

The purpose of this chapter is to determine whether there are differences in creative potential : (1) between total sample of teachers and student teachers; (2) between inservice teachers of Science, Commerce and Arts, (3) between student teachers of Science, Commerce and Arts, and (4) between inservice teachers and student teachers when dichotomized on the basis of subject specialisations.

Creative Potential of Inservice Teachers

The use of various autobiographical instruments in the form of checklists, questionnaires and inventories have found increasing favour with researchers in the identification of creative potential. The recent studies using the biographical inventory technique to predict success in artistic, literary and scientific creativity confirm this view (Schaefer and Anastasi, 1968; Anastasi and Schaefer, 1969; Taylor, Ellison and Tucker, 1966). Accordingly, Khatena's Something About Myself (SAM) was administered to a total sample of 180 inservice teachers specializing in the teaching of Science, Commerce and Arts subjects. There was an equal number of 60 teachers in each group. The second purpose of this investigation as stated in Chapter I, was to determine the creative potential of these 180 inservice teachers and also to find out whether the three groups of inservice teachers, specializing in the teaching of the fields stated above, differed in the extent of creative potential and the six factors measured by SAM. The following Table 34 shows the mean scores, standard deviations, and the respective ranks of the six factors for the total inservice teachers, as measured by Something About Myself (SAM).

It is obvious from the Table under reference that judged by the magnitude of means of the different factors, the 180 inservice teachers are higher on Factor IV (Intellectuality) followed by Factors III (Self-Strength), Factor I (Environmental

Sensitivity), Factor V (Individuality), Factor II (Initiative) and Factor VI (Artistry).

Table 34

Means, Standard Deviations and Rank Order
of Inservice Teachers on SAM (N = 180)

Factor	Description	Rank	Mean	S.D.
I	Environmental Sensitivity	III	3.16	1.61
II	Initiative	V	2.17	1.39
III	Self-strength	II	4.87	2.16
IV	Intellectuality	I	5.16	2.39
V	Individuality	IV	2.78	1.56
VI	Artistry	VI	2.03	1.31

The picture that would emerge from the above rank order results would be that the sample inservice teachers are Ss with an (1) intellectual curiosity, enjoying challenging tasks with imagination and like doing things and ideas to form something different. Besides, they possess (2) self-strength and have self-confidence, are resourceful, versatile and even prepared to take risks and have organisational ability. They are (3) environmentally sensitive in that they are open to the ideas of others, are interested in the beautiful and humorous aspects of experience and are sensitive to meaningful relations. They have (4) individuality and prefer to work alone than in a group, see themselves as self-starters, are critical of others, and are prepared to work for long hours

without getting tired. They have (5) initiative and can produce and play lead roles in dramatics and musical productions and are prepared to bring about changes in procedures and organisation. Lastly, they have (6) artistry in that they can produce objects, models, paintings, carvings, compose music, produce stories, plays, poems and other literary pieces, etc. etc.

Discussion

MacKinnon (1960) has reported intensive studies of highly effective individuals and suggested two variables as centrally determinative of effective functioning : (a) emotional stability or personal soundness, and (b) originality or creativity of thought and action. The role of original, creative thinking in teaching-learning processes seems to be far more important than it has long been believed. But there is considerable evidence (Jex, 1959; Taylor, 1960; Getzels and Jackson, 1962; Raina and Raina, 1971; Raina, 1971) at hand, that creative personalities tend to be estranged by their teachers or bosses and are not very well liked by them. Against this indictment it is important to note that the sample teachers of this study have awarded the first rank to intellectual curiosity and the enjoyment of doing challenging tasks with imagination. They do not like the crusty rigidity of executing things in a prescribed fashion or follow a routinized way of doing things. In order to accomplish this they have the necessary self-confidence, resource-fulness and versatility to

do this. What is more significant is the fact that they are prepared to take risks. But all these qualities, so laudable and commendable in themselves, will gather no moss because they lack individuality (rank IV) and are not prepared to work alone or be critical of others. In the realisation of their ideas and ideals, if they are asked to work for long hours with concentration they get tired. It would mean that they are more gregarious, less autonomous, and prefer working with people to working with things. This phenomenon of being dependent on the group is in close agreement of the low rank (XIII) that has been awarded by these teachers to Q₂ (Self-sufficiency) on Cattell's Sixteen Personality Factor Questionnaire discussed elsewhere in section A. A high Q₂ individual would rather work alone or with one or two assistants than with a committee and is not worried of his own ideas just because they are odd.

The authors of the Secondary Education Commission (1953) have observed that "the first requisite in this connection is to develop the capacity for clear thinking and receptivity to new ideas," (emphasis added). It is gratifying to note that the sample teachers are open to the ideas of others and would, hopefully, inculcate the same virtue in their students. But it is not passive receptivity of ideas alone that is sufficient. One has to be critical of the ideas of others also. "Genuine creative accomplishment, however" writes Torrance (1963), "requires not only independence of thinking but independence in judgement." Independence of judgement will lead one not to conform but criticize also. A truly creative

person, if critical of others, would bring himself into sharp conflict with the establishment and get himself isolated and alienated which, indeed, needs great courage. With Individuality at the fourth rank the sample teachers do not seem to be, perhaps, ready to do so.

It is satisfactory to note that the sample teachers have organizational abilities (rank II) but they lack the courage to bring about organisational and procedural changes (rank V). They, perhaps, believe it safe to stick to the middle of the road, keep the status quo intact and what may be characterized as the maritime analogies, "keeping things on the even keel, not rocking the boat and not making waves" (Mars, 1969).

It is to be noted, again, that the sample teachers have rated intellectual curiosity and the enjoyment of challenging tasks very favourably (rank I). But these qualities will run to seed and aridity if the individual does not step outside the protecting but limiting circles and take the initiative (rank V) to do the unfamiliar and uncommon. Perhaps, the phenomenon has a psychosocial explanation : "the family life (in India) tends to develop an acute sense of dependence with a strong sense of security, and a clear sense of responsibility without an accompanying sense of personal initiative or decision" (Taylor, 1948) and this explanation has been confirmed by Spratt (1966) and Kakar (1978).

One of the important characteristics of the creative person is that out of his creative strivings must emerge some

products like objects, models, paintings, carvings, musical compositions, stories, plays, poems and literary pieces, in a word Artistry (Khatena, Manual, 1971). The sample teachers have given it the bottom rank and that is the state of art in the present day teaching profession. The teachers who attach no importance to such creative endeavours would hardly encourage, much less inspire, their students to undertake such joyous exercises of creation. Such activities are calculated to interfere with the course coverage and threat of failure at the examinations and are to be viewed with disfavour and discouragement.

Intergroup Differences Among Teachers

One of the important observations made earlier in this study was that research on teacher characteristics suffered because of treating "teachers - male and female, young and old, primary grade and intermediate grade, teachers of English and Science - as a single group," (Getzels and Jackson, 1963). Cognizance, however, is not taken of the fact that differences within the teaching profession may obscure the very differences that need to be revealed. Sections A, B and C of this investigation have, by and large, supported the assumption that there are differences in the personality configurations of the inservice teachers and student teachers specialising in the teaching of the various fields. Is it true in the case of creative potential of various groups of teachers and student teachers who constitute the sample of this study? The following

data and the subsequent interpretation and discussion seek to provide an answer to this significant question which constituted the third purpose of this study.

(i) Rank Order of Creative Potential of Teachers

For the sake of a superficial and quick comparison of Science, Commerce and Arts teachers with each other an attempt was made to rank all the factors of Something About Myself (SAM) from the highest to the lowest for each group on the bases of mean scores. The relative position of the different values thus obtained is given in Table 35.

Table 35
Rank Order for SAM Factors for Science,
Arts and Commerce Teachers

Ranks	Science Teachers (N = 60) Factor	Arts Teachers (N = 60) Factor	Commerce Teachers (N = 60) Factor
1.	IV (6.30)	IV (4.70)	III (5.20)
2.	III (5.03)	III (4.63)	IV (4.76)
3.	V (3.01)	I (3.14)	I (3.20)
4.	I (3.00)	VI (2.34)	V (2.86)
5.	II (1.73)	V (2.27)	II (2.00)
6.	VI (1.57)	II (2.24)	VI (1.57)

It is evident from the Table under reference that while Science and Arts teachers have awarded the first rank to Factor II (Intellectuality), the Commerce teachers have

awarded it the second rank. Again, Factor III (Self-Strength) has been ranked second by Science and Arts teachers, the Commerce teachers have ranked it first. Factor I (Environmental Sensitivity) has been given the third rank by Arts and Commerce teachers uniformly but the Science teachers have ranked it as fourth. The Commerce teachers have given Factor V (Individuality) fourth rank but it has received third rank on the part of Science teachers and fifth rank on the part of Arts teachers. The Science teachers and Commerce teachers have ranked factor II (Initiative) as fifth while the Arts teachers have awarded it the bottom, rank, viz. sixth. Factor VI (Artistry) has been given sixth rank by Science teachers and Commerce teachers but the Arts teachers have awarded it the fourth rank. The conclusion warranted by the above phenomenon is that there are some variations in the ranking of the six factors of SAM on the part of teachers.

(ii) Next an attempt was made to find out the rank order correlation between the six factor of SAM for the three groups of teachers. As already noted elsewhere the ranking was done on the magnitude of means. The rank correlation was done for the three groups, taking two at a time. Rhos for different groups of teachers are presented in Table 36.

Contd.

Table 36

Rank Order Correlation Between Three Groups
of Teachers on SAM

S.No.	Groups compared	rho	<u>P</u>
1.	Science and Arts Teachers	0.715	NS
2.	Science and Commerce Teachers	0.886	.05
3.	Arts and Commerce Teachers	0.772	NS

It is obvious from the above Table that there is no agreement whatsoever between the ranking of the six factors of Something About Myself (SAM) between inservice Science and inservice Arts teachers, between Arts and Commerce teachers, while there is a moderate agreement between Science inservice teachers and Commerce inservice teachers.

Analysis of Variance

The concept of analysis of variance and its feasibility in this study was indicated earlier and needs no repetition. The analysis of variance was used to compare the creative potential of the three groups of teachers : Science, Commerce and Arts. The t test was, however, used to test the significance of the differences between any two groups on each of six factors which indicated significant F ratios. The F ratios and t tests for the six factors are presented in Appendix F Tables LVIII through LX. However, Table 37 presents a summary of Means, S.Ds. and F ratios on the six factors of Something About

Myself (SAM), the creativity instrument used in this study.

Table 37 indicated that the three groups of inservice teachers were significantly different on three of the six factors assessed by SAM. The three factors are : Factor IV - Intellectuality; Factor V - Individuality; Factor VI - Artistry.

Table 37

Summary of Means, Standard Deviations and F ratios on SAM for Three Groups of Teachers

SAM	Science Teachers (N = 60)		Commerce Teachers (N = 60)		Arts Teachers (N = 60)		F ratio
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
I	3.00	1.74	3.20	1.78	3.14	1.74	0.31
II	1.73	1.43	2.00	1.62	2.24	1.61	1.97
III	5.03	1.96	5.20	2.13	4.63	2.51	1.10
IV	6.30	2.49	4.76	2.24	4.70	2.18	8.15**
V	3.00	1.73	2.86	1.84	2.27	1.56	3.34*
VI	1.57	1.23	1.57	1.54	2.34	1.73	7.56**

F* Significant at .05 level

**Significant beyond .01 level

Tables 38, 39 and 40 contain the summary of the various t-test combinations for those factors with significant F ratios for Science-Arts, Science-Commerce and Arts-Commerce inservice teachers.

Table 38

Summary of Mean Comparisons of Science and Arts Teachers on Those Factors of SAM with Significant t ratios

SAM	Science Teachers (N = 60) Mean	Arts Teachers (N = 60) Mean	t ratio	P
IV	6.30	4.70	3.72	Beyond .01
V	3.00	2.27	2.43	.05
VI	1.57	2.34	2.75	Beyond .01

Table 39

Summary of Mean Comparisons of Science and Commerce Teachers on Those Factors of SAM with Significant t ratios

SAM	Science Teachers (N = 60) Mean	Commerce Teachers (N = 60) Mean	t ratio	p
IV	6.30	4.76	3.58	Beyond .01
V	3.00	2.86	0.42	NS
VI	1.57	1.57	0.00	NS

Table 40

Summary of Mean Comparisons of Arts and Commerce Teachers on Those Factors of SAM with Significant t ratios

SAM	Commerce Teachers (N = 60) Mean	Arts Teachers (N = 60) Mean	t ratio	p
IV	4.76	4.70	1.46	NS
V	2.86	2.27	1.90	NS
VI	1.57	2.34	2.57	.05

It is evident from Table 38 that Science and Arts teachers differed on three factors, viz. Factor IV (Intellectuality); Factor V (Individuality) and Factor VI (Artistry).

It is again clear from Table 39 that Science and Commerce teachers differed only one factor, viz. : IV (Intellectuality).

A study of Table 40 revealed that Commerce and Arts teachers differed on only one factor viz. Factor VI (Artistry).

More specifically, the following conclusion can be arrived at from Tables 38, 39, and 40.

(a) Science and Arts Teachers

1. Science teachers have more intellectuality than Arts teachers.
2. Science teachers have more individuality than Arts teachers.
3. Arts teachers have more artistry than Science teachers.

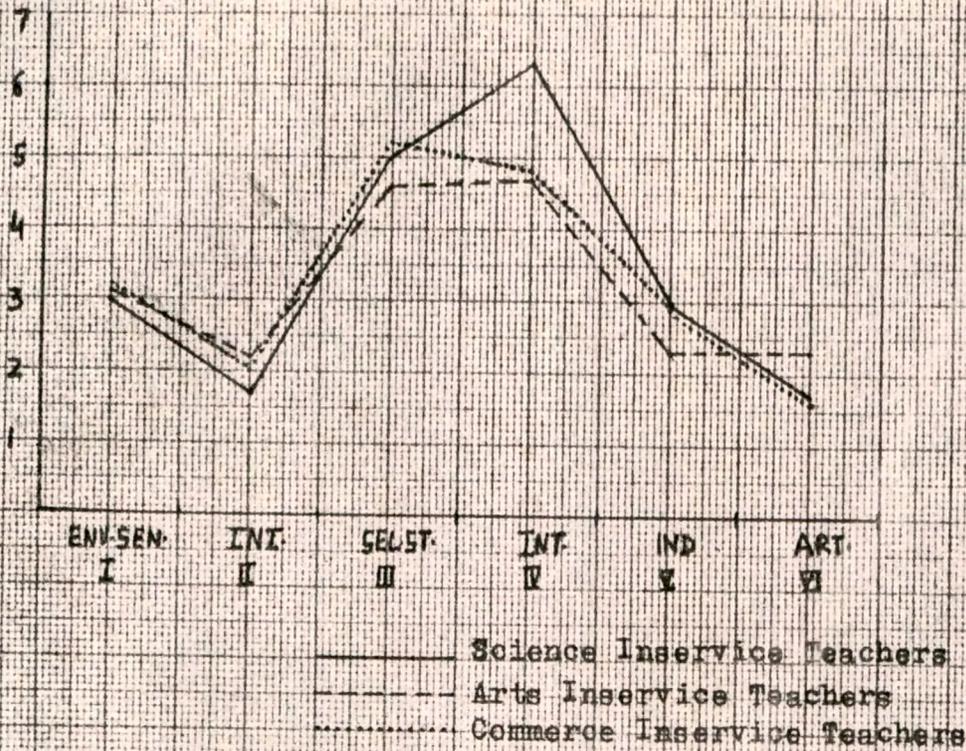
(b) Science and Commerce Teachers

1. Science teachers have more intellectuality than Commerce teachers.
2. Science teachers and Commerce teachers do not differ significantly on the factor of individuality.
3. Science teachers and Commerce teachers do not differ significantly on the factor of artistry.

(c) Commerce and Arts Teachers

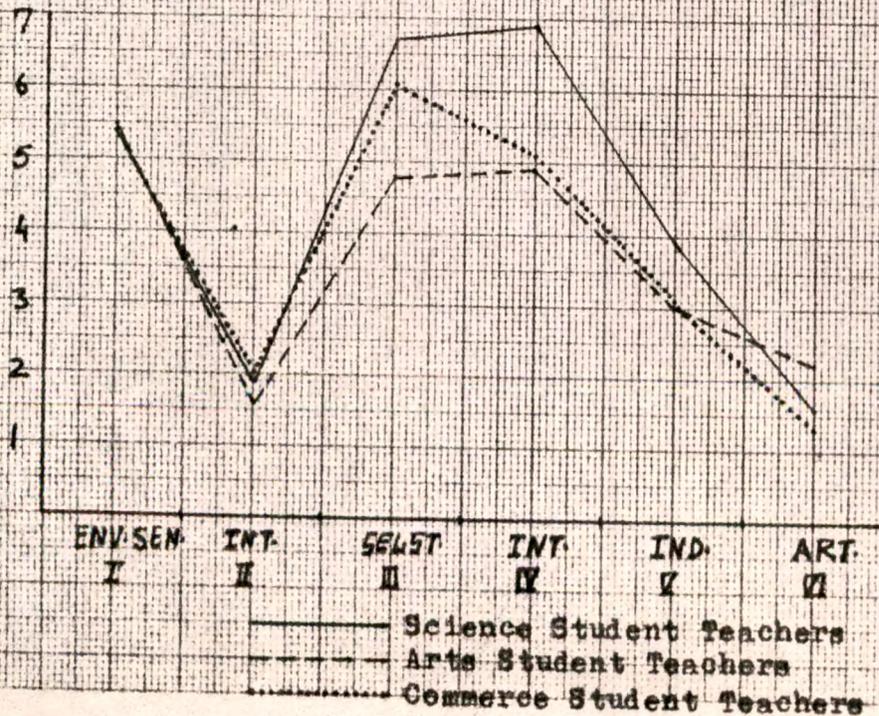
1. Commerce and Arts teachers do not differ significantly on the factor of intellectuality.
2. Commerce and Arts teachers do not differ significantly on the factor of individuality.

FIGURE XIII
 PROFILE OF SCIENCE, ARTS AND COMMERCE INSERVICE TEACHERS ON
 SOMETHING ABOUT MYSELF (SAM)



I-Teach

FIGURE IV
 PROFILE OF SCIENCE, ARTS AND COMMERCE STUDENT TEACHERS ON
 SOMETHING ABOUT MYSELF (SAM)



S-Teach

3. Arts teachers have more of artistry than Commerce teachers.

The raw score means of the Something About Myself (SAM) were plotted in Figure XIII. The graphical representation of the data, as shown here, clearly demonstrate an overlapping of the SAM factors where there were no significant \pm differences between the three groups of teachers. Contrary to this there were sharp differences reflected in the curves where there were significant \pm differences. This representation thus, lends further support to the results arrived at.

Discussion

In the light of the above results it may be observed that Science teachers but not Arts teachers have a higher degree of intellectuality. They enjoy challenging tasks with imagination and are not routine bound. They would like to reconstruct things and ideas to form something different. Again, they are prepared to work alone rather than in groups, and view themselves as self starters, are critical of others, think for themselves and are prepared to work for long hours without getting tired.

The Arts teachers but not the Science teachers have a higher degree of artistry, in that they can produce objects, models, paintings and carvings, they can compose music, produce stories, plays, poems and other literary pieces.

The marked superiority of the Arts teachers compared to Science teachers in the creative orientation of artistry as symbolised by the capacity to produce stories, plays, poems and

other literary pieces etc. etc. may be explained, again, by the very nature of Science Vs. Arts. The Arts teachers have an advantage in that their subjects (Arts) offers greater scope for an expression, delineation, perhaps, a little of polish of language also but the Science teachers do not have these necessary pre-requisites and naturally cannot come up to the required level of artistry of the Arts teachers. Kirkman (1967), for instance has demonstrated that, "it is an exception rather than the rule to find a young engineer or scientist who can write plainly and readily on specialist or general topics." In short, the education of the Science teachers, (there may be exceptions) upto their masters level has not apparently equipped them fully well with the capacity to write stories, plays, poems and musical compositions, etc. etc. This seems to be, perhaps, the only plausible explanation of the phenomenon noted above.

The Science teachers, again, have a significant edge over the Commerce teachers in intellectuality. The Science teachers as compared to Commerce teachers are more intellectually curious, enjoy challenging tasks with imagination, have a preference for adventure over routine and dislike to do things in a conservative fashion. These results are in agreement with the relative performance of Science and Commerce teachers on the Cattell's Sixteen Personality Factor Questionnaire discussed elsewhere in Section A, where the Science teachers have expressed themselves as free thinking, experimenting, analytical radicals and also self sufficient, resourceful persons preferring their own decisions. The Commerce teachers, on the other hand are

conservative people, respecting established ideas and ideals, never attempting to deviate from the golden mean which would, no doubt, bring them into conflict with outside authority. Naturally they cannot, as group dependent people, like adventure or do things in a novel way.

The explanation of the obvious Science Vs. Commerce difference in creative potential, perhaps, is due to personality configuration of Science and Commerce teachers and also the subject specialisation of Commerce which does not, so it seems, allow greater scope for experimentation and adventure as compared to Science.

The results also indicate that Arts teachers are favourably placed in Artistry : producing objects, models, stories, plays, poems and other literary pieces. Once again the plausible explanation that seems, perhaps, to be in order is that, the deficit of Commerce teachers in this important potential may be due to differential subject / cultural opportunities of the Arts teachers and Commerce teachers.

SECTION F

CREATIVE POTENTIAL OF STUDENT TEACHERS

The development of fully functioning individuals, wrote Torrance (1964) has long been an avowed purpose of education. But the teacher educators and their student teachers, who talk enthusiastically about the development of the unique capacities of the individual, have been primarily concerned with instruction. The emphasis has to shift to a creative approach both on the part of professors of education and student teachers because creative teaching, it is believed, aims to achieve a liberalisation of teaching and learning processes.

It may be observed that the creativity of future teachers has been either nourished or stifled in homes, schools and different communities as those young people were growing up. It would be, therefore, desirable to understand the creative personality characteristics of student teachers and the way they think or the kind of thinking strategies they employ and the products that emerge as a result of their creative strivings.

It was with this purpose that Khatena's creativity instrument Something About Myself (SAM) was administered to 180 student teachers specialising in the teaching of Science, Arts and Commerce subjects at their B.Ed. level. What are the creative characteristics of these student teachers and are there any significant differences between student teachers specializing in the teaching of the three disciplines. The following data, their interpretation and discussion seeks to

provide an answer to this question.

Table 41
Means, Standard Deviations and Rank Order
of Student Teachers on SAM (N = 180)

	Factor	Rank	Mean	S.D.
I	Environmental Sensitivity	III	5.21	1.02
II	Initiative	V	2.04	1.30
III	Self Strength	I	5.77	2.24
IV	Intellectuality	II	5.61	2.26
V	Individuality	IV	3.34	1.60
VI	Artistry	VI	1.93	1.22

The raw score means, standard deviations and the respective rank order of the six factors for the 180 student teachers as measured by the Something About Myself are presented in Table 41. It is evident from the Table under reference that the student teachers have awarded first rank to Factor III (Self-Strength), second rank to Factor IV (Intellectuality), and third rank to Factor I (Environmental Sensitivity). Again the student teachers have awarded fourth rank to Individuality, fifth rank to Initiative and the bottom rank, viz. sixth to Artistry.

The picture that would argue from the above rank order would be that the sample student teachers (1) possess self-confidence in matching talents against others, are resourceful, willing to take risks, and have a desire to excel and have

organizational ability. They have also (2) intellectual curiosity, enjoying challenging tasks, have preference for adventure over routine, and dislike doing things in a prescribed and routine way. They are (3) environmentally sensitive people who are open to the ideas of others, are interested in the beautiful and humorous aspects of experience, and have sensitivity to meaningful relations. They would like (4) to work alone rather than in groups, see themselves as self-starters, critical of others and think for themselves. In case need arises they are prepared to work for long hours without feeling tired. They are people who are willing (5) to direct, produce and/or play lead roles in dramatic and musical productions, produce new formulas or products and bring about change in organizational procedures. And lastly, they can (6) produce objects, models, paintings, compose music, produce stories, plays, poems and literary pieces.

Discussion

The personality characteristics of creative people have been the subject of a number of studies. It appears that creative persons are as complex as the creative process itself. There seems to be no single and consistent picture which researches can draw as a prototype of the highly creative individual. There are, no doubt, contradictions and incongruities among them. It is wrong to think that there is one stable set of characteristics to be considered when one is studying the creative individuals. However, recognizing the relevance

of these observations, MacKinnon (1963) described the personality characteristics of creative persons as :

"intelligent, original, independent in thought and action, open to experience both of the inner self and outer world, intuitive, aesthetically sensitive and free from crippling restraints, they have high energy level, a persistent commitment to creative endeavour and a strong destiny which includes a degree of resoluteness and a measure of egoism."

If one were to study the personality characteristics of creative persons given by Taylor (1964), he would find that there is a considerable overlapping between the two lists.

In the light of the above observations it is somewhat encouraging to note that the student teachers have ranked self confidence at the top. They possess sufficient self confidence, are resourceful, willing to take risks and have a desire to make a mark in organizational work. Besides this, they have intellectual curiosity, enjoy challenging tasks, do not like a life of routine conformism but have a passion to reconstruct and recreate things and ideas into something different and navigate uncharted seas. They are environmentally sensitive people in that they are open to the ideas of others and do not suffer from paralyzing dogmatism. They have a high level of sensitivity : interested in the beautiful, etc etc.

In short they share the creative characteristics of MacKinnon (1963) : "intelligent, original, independent in thought.... aesthetically sensitive and far from crippling restraints." But a moments reflection would suggest that a

creative person has not only to dream but must have a "strong commitment to creative endeavours and a sense of destiny" (MacKinnon, 1963). This strong commitment suggests the possession of initiative. It is not only a subjective willingness but the objective capacity to take risks, though they may only be what McClelland (1964) called as 'calculated risks'. These 'calculated risks' cannot be actualized or realized if the individual initiative is lacking or absent : initiative has been given the fifth rank by the sample student teachers. They are not willing or, perhaps, capable to produce new formulas or products.

The student teachers, besides lack individuality : (rank fourth) are not prepared to work alone but in groups, do not see themselves as self-starters, are not prepared to be critical of others, because that would isolate them from the group norm or the mean. It is easy to follow the thoughts of others but difficult to think one's own thoughts and this the student teachers do not seem to have rated favourable. They are also not prepared to work for long hours without getting tired. They lack what MacMinnon (1963) and others have characterized as a "high energy level." In short, one must give "evidence of a kind of courage and autonomy that makes it possible for them to try the new, the unusual," (Hughes, 1962). The comperative lack of individuality gathers additional support in the XV rank given to factor N (Forthright Vs. Shrewd) by the sample student teachers. They are, (N-) : "gregarious, content with what comes" with a "blind trust in human nature," Cattell,

(Handbook, 1976).

The creative orientation : Artistry, has been given the bottom rank, sixth, by the student teachers. They, perhaps, lack the zest or more understandably the capacity to produce objects, models, paintings, stories, poems, plays and other literary pieces. The whole educative process through which the student teachers have undergone is at war with the nurturance of such desirable qualities. The teachers colleges themselves seem to fear any deviations and it is only the academically achieving students who find a mention on their roll calls of honour. Mechanical course coverage is the death-knell of creativity. In short, a weak student body 'educated' by a weak faculty cannot be expected to lead to the "emergence of the original and of individuality" (Anderson, 1959).

Intergroup Differences Among Student Teachers

The evidence presented in Sections A, B, C and D of this study has, by and large, lent some significant support to the observation that there are differences between teachers and students teachers of Science, Arts and Commerce in the personality configuration. The inservice teachers differ in the extent and nature of creative orientations. Is this true in the case of student teachers preparing to teach in the methodologies of Science, Arts and Commerce? The following data, interpretation and discussion seek to provide an answer to this question. It would be recalled that Khatena creativity instrument Something About Myself (SAM) was administered to 180

student teachers - 60 each in the subject of Science, Arts and Commerce.

(i) Rank Order of Creative Potential of Student Teachers

In order to have a quick and superficial comparison of Science, Arts and Commerce student teachers with each other an attempt was made to rank all the six factors of Something About Myself (SAM) from the highest to the lowest for each group on the basis of mean scores. The relative position of the different factors thus obtained is presented in Table 42.

Table 42

Rank Order of SAM Factors for Science, Arts and Commerce Student Teachers

Rank	Science Students Factor	Arts Students Factor	Commerce Students Factor
I	IV (6.94)	I (5.05)	III (6.10)
II	III (6.65)	IV (4.93)	I (5.44)
III	I (5.43)	III (4.77)	IV (5.10)
IV	V (3.86)	V (3.03)	V (3.14)
V	II (1.87)	VI (2.20)	II (1.97)
VI	VI (1.53)	II (1.64)	VI (1.37)

A study of this Table reveals that while Science student teachers have awarded first rank to factor IV (Intellectuality), the Arts and Commerce student teachers have awarded this factor second and third ranks, respectively. Again, the Commerce

student teachers have ranked Factor I (Environmental Sensitivity) as second, the Science and Arts student teachers have awarded it third and first ranks, respectively. Arts student teachers have awarded third rank to Factor III (Self-Strength) but Commerce and Science teachers have ranked it as first and second, respectively. Factor V (Individuality) has been ranked fourth by all the student teachers of the three faculties. The Science teachers have ranked Factor II (Initiative) as fifth but the Arts and Commerce student teachers have given it VI and V ranks, respectively. Lastly, Factor VI (Artistry) has been given the sixth rank by Science student teachers, fifth by Arts student teachers and again VI by Commerce student teachers.

(ii) Next an attempt was made to find out the rank order correlation between the six factors of SAM for the three groups of teachers. As already noted above the ranking was done for the three groups, taking two at a time. Rhos for different groups of teachers are presented in Table 43.

Table 43

Rank Order Correlation Between Three Groups of Teachers on SAM

S.No.	Groups Compared	rho	P
1.	Science and Arts Student Teachers	0.772	NS
2.	Science and Commerce Student Teachers	0.829	.05
3.	Arts and Commerce Student Teachers	0.770	NS

The above Table indicates that while there is no agreement between Science and Arts student teachers, between

Arts and Commerce student teachers, there is a moderate agreement between Science and Commerce student teachers.

Analysis of Variance

The concept of analysis of variance and its suitability in this study was discussed in detail in Section A of this chapter and its reproduction would, consequently, serve no purpose. In brief, the analysis of variance was used to compare the creative potential of the three groups of student teachers specializing in the teaching of Science, Arts and Commerce. The t test was, however, used to test the significance of the differences between any two groups on each of the six factors which indicated significant F ratios. The F ratios and t tests for the six factors are presented in Appendix F Tables LXI through LXIII. But, Table 44 presents a summary of Means, Standard Deviations, and F ratios of the six factors of Something About Myself (SAM) used in this study.

Table 44 indicated that the three groups of student teachers were significantly different on four of the six factors of SAM. They were : Factor III (Self-Strength), Factor IV (Intellectuality), Factor V (Individuality), and Factor VI (Artistry).

Tables 45, 46 and 47 contain the summary of the various t test combinations for these factors with significant F ratios for Science-Arts, Science-Commerce and Arts-Commerce student teachers.

Table 44

Summary of Means, Standard Deviations and F ratios for Three Groups of Student Teachers on SAM

SAM	Science Students		Commerce Students		Arts Students		F
	Mean	S.D.	Mean	S.D.	Mean	S.D.	
I	5.43	1.36	5.44	1.12	5.50	1.14	0.23
II	1.87	1.61	1.97	1.50	1.64	1.54	0.93
III	6.65	1.84	6.10	2.08	4.77	2.49	11.99**
IV	6.94	1.77	5.10	2.42	4.93	2.19	18.55**
V	3.86	1.73	3.14	1.34	3.03	1.78	3.84*
VI	1.53	1.34	1.37	1.28	2.20	1.46	4.98**

F * Significant at .05 level
 **Beyond .01 level

Table 45

Summary of Mean Comparison of Science and Arts Student Teachers on Those SAM Factors with Significant t ratios

SAM	Science Students Mean	Arts Students Mean	t	P
III	6.65	4.77	4.70	Beyond .01
IV	6.94	4.93	1.83	NS
V	3.86	3.03	2.59	.05
VI	1.53	2.20	2.58	.05

Table 46

Summary of Mean Comparisons of Science and Commerce Student Teachers on Those SAM Factors with Significant t ratios

SAM	Science Students Mean	Commerce Students Mean	t	P
III	6.65	6.10	1.49	NS
IV	6.94	5.10	4.72	Beyond .01
V	3.86	3.14	2.57	.05
VI	1.53	1.37	0.67	NS

Table 47

Summary of Mean Comparison of Commerce and Arts Students Teachers on Those SAM Factors with Significant t ratios

SAM	Commerce Students Mean	Arts Students Mean	t	P
III	6.10	4.77	3.17	Beyond .01
IV	5.10	4.93	0.40	NS
V	3.14	3.03	0.39	NS
VI	1.37	2.20	3.46	Beyond .01

It is clear from Table 45 that Science student teachers and Arts student teachers differed on three factors, viz : Factor III (Self-Strength), Factor V (Individuality), and Factor VI (Artistry).

It is, again, obvious from Table 46 that Science student teachers and Commerce student teachers differed on two factors, viz : Factor IV (Intellectuality), and Factor V (Individuality).

Lastly, a study of Table 47 indicated that Commerce student teachers and Arts student teachers differed, again on two factors, viz : Factor III (Self-Strength) and Factor VI (Artistry).

More specifically, the following conclusions can be arrived at after a study of Tables 45, 46 and 47.

(a) Science and Arts Student Teachers

1. Science student teachers have more self-strength than Arts student teachers.
2. Science student teachers have more individuality than Arts student teachers.
3. Arts student teachers have more artistry than Science student teachers.

(b) Science and Commerce Student Teachers

1. Science student teachers have more intellectuality than Commerce student teachers.
2. Science student teachers have more individuality than Commerce student teachers.
3. Science student teachers and Commerce student teachers do not differ significantly on the factors of self-strength and artistry.

- (c) Commerce and Arts Student Teachers
1. Commerce student teachers have more of self-strength than Arts student teachers.
 2. Arts student teachers have more artistry than Commerce student teachers.
 3. Commerce student teachers and Arts student teachers do not differ significantly on the factors of intellectuality and individuality.

The raw scores means of Something About Myself (SAM) were plotted in Figure XIV. The graphical representation of the data, as shown here, clearly demonstrates an overlapping of the SAM factors where there were no significant \pm differences. Contrary to this there were sharp differences reflected in the curves where there were significant \pm differences. This representation thus, lends further support to the results arrived at.

Discussion

In the light of the results the picture that would emerge for the Science student teachers is that they possess self-confidence in matching talents against others, are resourceful and versatile with a willingness to take risks and have a desire to excel in organisational ability. They also prefer to work alone rather than in groups and see themselves as self-starters. They are critical of others, prepared to work for long hours without getting fatigued. In spite of the fact that the Arts student teachers do not view themselves favourably on these two factors of creative orientations they

FIGURE XV
 PROFILE OF TOTAL INSERVICE TEACHERS AND TOTAL STUDENT TEACHERS
 ON SOMETHING ABOUT MYSELF (SAM)

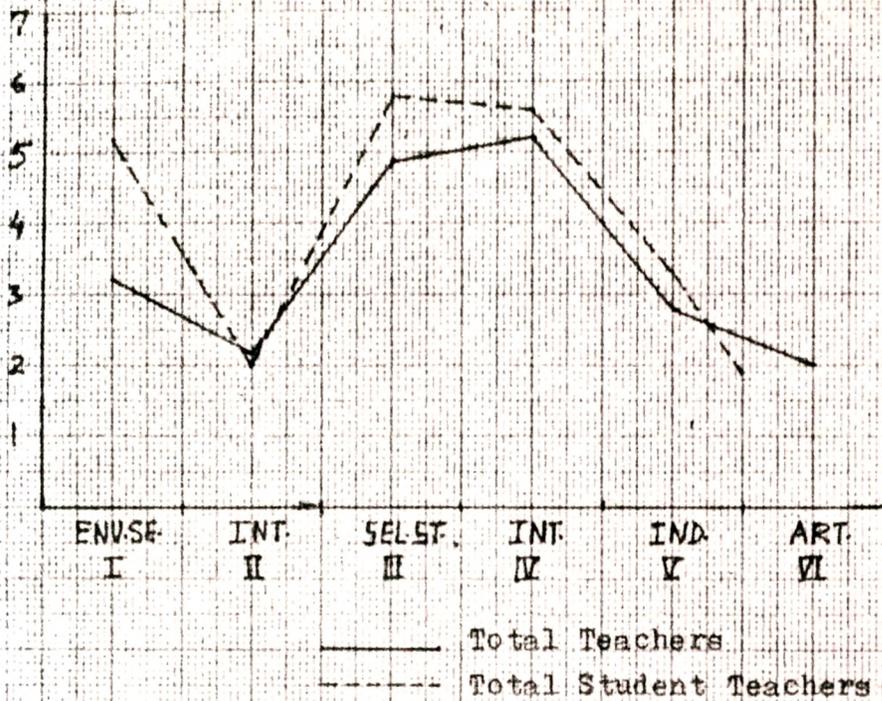
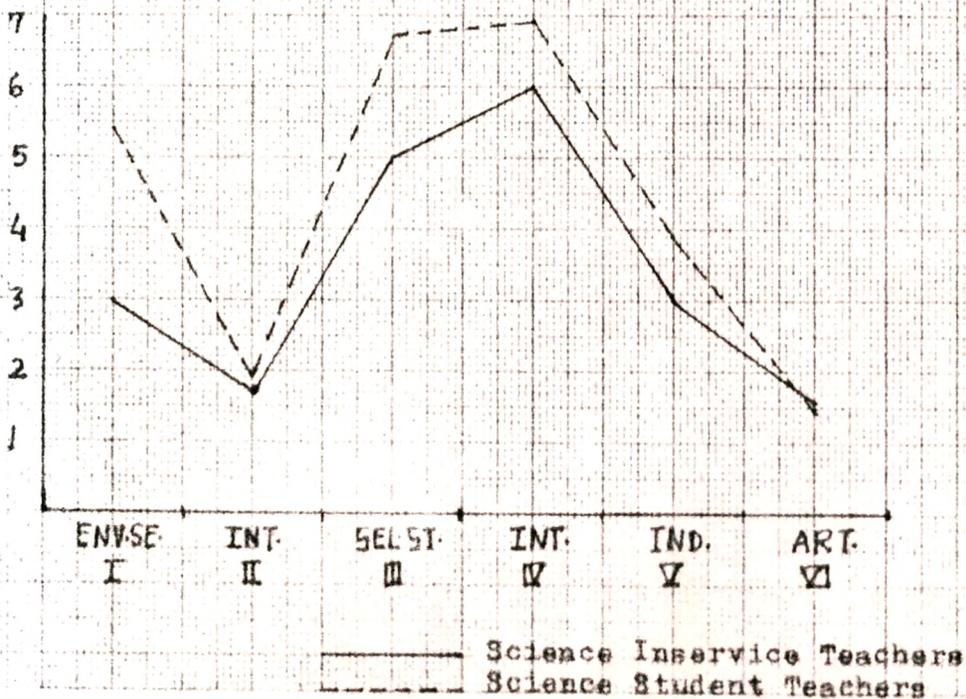


FIGURE XVI
 PROFILE OF INSERVICE SCIENCE TEACHERS AND SCIENCE STUDENT
 TEACHERS ON SOMETHING ABOUT MYSELF (SAM)



have their undoubted merit in that they can produce objects, models, stories, plays, poems and other literary compositions. There seems to be some sort of corroborative evidence of the radicalism and self-sufficiency of Science teachers in their significantly higher mean on Q_1 and Q_2 of the Cattell's Sixteen Personality Factor Questionnaire discussed earlier. It may be noted that higher Q_1 persons are more radical, experimenting, analytical and free thinking. They "express more interest in Science than religion, in more analytical thought," (Cattell, Handbook, p.104). Again high Q_2 persons are self-sufficient, resourceful and, what is more important, prefer their own decisions. They are no committee men but prefer to work alone. Therefore, the creative orientations of the Science student teachers and Arts student teachers are as they should be. The Arts student teachers have a favourable edge on the factor of Artistry and it seems that Arts subjects have made them proficient in expressing a desire in writing stories, plays, producing models and the like. But a cardinal point that needs attention is that both the groups do not differ at all in the creative potential of Initiative (Factor II of SAM), which enables a person to make his potential, actual.

Science student teachers as compared to Commerce student teachers have higher intellectual curiosity, enjoy challenging tasks with imagination, do not want to be routine bound and like reconstructing things and ideas to form something different. Again, they prefer to work alone rather than in groups, see themselves as eccentric and are critical of others,

prepared to work for long hours without getting tired. In case intellectuality and individuality are considered by far the most important characteristics of the creative potential than the poverty of Commerce student teachers on these two orientations may, perhaps, be due to "hereditary reasons, experience from birth to adolescence, influence within the home, at school and college or in the fastnesses in their minds," (Hudson, 1976), or alternatively this marked deficit may be due, perhaps, to their low socio-economic status from which the Commerce student teachers generally hail. If differential socio-economic status implies differential cultural opportunities then the deficit of the Commerce student teachers in these two orientation may, perhaps, be due to this reason as shown by Ogletree and Uglaki (1973).

The Commerce student teachers as against Arts student teachers possess self-confidence in matching talents against others, are resourceful, versatile and willing to take risks and excel in organisational ability. The Arts student teachers on the other hand have favourably viewed themselves on Artistry: production of stories, plays, literary pieces and objects etc., etc. A reference to Table 14 clearly shows that the Commerce student teachers are in possession of C+, H+, L-, and M- factor pattern on the Cattell's Sixteen Personality Factor Questionnaire as compared to Arts student teachers. A high C person is emotionally mature, unruffled and faces reality calmly; a high H person is adventurous (Parmia), while a high L person is dogmatic, dwelling upon frustrations and irritable. But along

with it a high M person is more interested in art, theory, basic beliefs and absorbed in ideas, Cattell (Handbook, p.98). The Arts student teachers, it may be noted have L+ and M+ as compared to Commerce students teachers. The results of Commerce student teachers and Arts student teachers, as symbolized by the two instrument 16 PF and SAM on the two creative orientations seem to be complementary, at least for these two samples and under the conditions of this study.

SECTION G

TEACHERS AND STUDENT TEACHERS :
A COMPARISON OF CREATIVE POTENTIAL

Creativity has long been considered the highest form of mental functioning and human achievement (Stiles, 1970). But the field of creativity functioning has received practically scant attention on the part of those responsible for guiding the destinies of children in and outside the classroom. The teachers no less than the parents are averse to recognize the great potentialities lodged in the children that await a release. It is not creativity that rules but conformity that holds the supreme position. But the truth is that the creative mind is unafraid of the unknown, such a frame of mind instead tolerates and welcomes the unfamiliar as a source of opportunity and inspiration. In fact as far as creativity is concerned, teaching and learning are closely interrelated - Creative teachers performance tends to stimulate creative learning with the result that both teachers and students expand potentialities for creativity (Stiles, 1970). It would be, therefore, fruitful to see to what extent a sample of inservice teachers and student teachers possess this great potential and whether there are any similarities or dissimilarities in the various creative orientations between the two groups as measured by a measure of creativity : here Khatena's Something About Myself (SAM).

Briefly an attempt would be made in this section to present evidence relating to one significant question : Are there any significant differences between the inservice teachers and student teachers of the various fields, viz., Science, Arts and Commerce, on a measure of Creativity?

Rank Order of Creative Potential
of Teachers and Student Teachers

In order to make a quick and superficial comparison of the total sample of inservice teachers; Science teachers and Science student teachers; Commerce teachers and Commerce student teachers; and Arts teachers and Arts student teachers with each other, an attempt was made to rank all the six creative orientations (factors) (SAM) from highest to lowest for each group of the above groups on the basis of the mean scores of the various factors. The relative position of different factors thus obtained are presented in Table 48 through 51.

Teachers and Student Teachers

Table 48, where the rank order of the six factors of SAM have been presented, revealed that while the total teachers have given first rank to factor IV (Intellectuality) the total student teachers group has given second rank to this factor of Intellectuality. Factor III (Self-Strength) has been ranked first by the student teachers but second by the teachers. Both the teachers and student teachers have uniformly awarded third rank to Factor I (Environmental Sensitivity), fourth rank to

Table 48
Rank of SAM Factors for Total Teachers
and Total Student Teachers

Rank	Factor	Teachers (N=180)	Factor	Student Teachers (N= 180)
I	IV	(5.16)	III	(5.77)
II	III	(4.87)	IV	(5.61)
III	I	(3.16)	I	(5.21)
IV	V	(2.78)	V	(3.34)
V	II	(2.17)	II	(2.04)
VI	VI	(2.03)	VI	(1.93)

Table 49
Rank Order of SAM Factors for Science
Teachers and Science Student Teachers

Rank	Factor	Science Teachers (N = 60)	Factor	Science Student Teachers (N = 60)
I	IV	(6.30)	IV	(6.94)
II	III	(5.03)	III	(6.65)
III	V	(3.01)	I	(5.43)
IV	I	(3.00)	V	(3.86)
V	II	(1.73)	II	(1.87)
VI	VI	(1.57)	VI	(1.53)

Table 50

Rank Order of SAM Factors for Commerce Teachers and Commerce Student Teachers

Rank	Factor	Commerce Teachers (N = 60)	Factor	Commerce Student Teachers (N = 60)
I	III	(5.20)	III	(6.10)
II	IV	(4.76)	I	(5.44)
III	I	(3.20)	IV	(5.10)
IV	V	(2.86)	V	(3.14)
V	II	(2.00)	II	(1.97)
VI	VI	(1.57)	VI	(1.37)

Table 51

Rank Order for SAM Factors for Arts Teachers and Arts Student Teachers

Rank	Factor	Arts Teachers (N = 60)	Factor	Arts Student Teachers (N = 60)
I	IV	(4.70)	I	(5.05)
II	III	(4.63)	IV	(4.93)
III	I	(3.14)	III	(4.77)
IV	VI	(2.34)	V	(3.03)
V	V	(2.27)	VI	(2.20)
VI	II	(2.24)	II	(1.64)

Factor V (Individuality), fifth rank to Factor II (Initiative) and sixth rank to Factor VI (Artistry). In short except a slight deviation in factor III (Self-Strength) and Factor IV (Intellectuality) there is perfect agreement between the two groups (teachers and student teachers) in ranking Factor I (Environmental Sensitivity), Factor II (Initiative), Factor V (Individuality) and Factor VI (Artistry).

Science Teachers and Science Student Teachers

In Table 49 are presented the rank order results, of the six factors of SAM, on the part of the Science teachers and Science student teachers. An inspection of this Table revealed that both the teachers and student teachers have uniformly ranked factors IV (Intellectuality) and Factor III (Self-Strength) as first and second, respectively. The teachers have awarded third rank to Factor V (Individuality) but the student teachers have awarded it the fourth rank. The teachers have awarded fourth rank to Factor I (Environmental Sensitivity) but the student teachers have given it third rank. Factor II (Initiative) has been ranked uniformly fifth by the teachers and student teachers and Factor VI (Artistry) has given sixth rank by both the teachers and students.

Commerce Teachers and Commerce Student Teachers

The results of the rank order of the six factors of SAM for Commerce teachers and Commerce student teachers are presented in Table 50. It is evident from the Table that

Factor III (Self-Strength) has been given the first rank by the Commerce teachers and Commerce student teachers. While Factor IV (Intellectuality) has been ranked second by the Commerce teachers, the Commerce student teachers have ranked it third. Factor I (Environmental Sensitivity) has been ranked third by Commerce teachers but the Commerce student teachers have given it second rank. There is a great agreement between the ranking of Factor V (Individuality), Factor II (Initiative) and Factor VI (Artistry) between the Commerce teachers and Commerce student teachers. Both teachers and student teachers have ranked them as fourth, fifth and sixth.

Arts Teachers and Arts Student Teachers

In Table 51 are presented the ranking of the six factors of SAM on the part of Arts teachers and Arts student teachers. An inspection of the Table revealed that while Arts teachers have awarded first rank to factor IV (Intellectuality), the Arts student teachers have awarded it the second rank. Factor III (Self-Strength) has been given second rank by the teachers and fourth rank by the students. Factor I (Environmental Sensitivity) has been ranked third by Commerce teachers but first by the student teachers. Factor VI (Artistry) has received fourth rank at the hands of Commerce teachers but fifth at the hands of student teachers. Factor V (Individuality) has been ranked fifth and fourth by the Commerce teachers and student teachers respectively. Both the teachers and student teachers have ranked factor II (Initiative) as the sixth.

(ii) Next an attempt was made to find out the rank order correlation between the six factors of Something About Myself (SAM) for the four groups of total teachers and total student teachers, Science teachers and Science student teachers, Commerce teachers and Commerce student teachers, and Arts teachers and Arts student teachers. As already noted above the ranking was done on the magnitude of the raw scores means. The rank correlation was done for the four groups taking two at a time. Rhos for different groups are presented in Table 52.

Table 52

Rank Order Correlation Between the Four Groups on SAM

S.No.	Groups compared	rho	P
1.	Total Teachers and Total Student Teachers	0.940	.01
2.	Science Teachers and Science Student Teachers	0.940	.01
3.	Commerce Teachers and Commerce Student Teachers	0.940	.01
4.	Arts Teachers and Arts Student Teachers	0.770	NS

A study of the above Table clearly indicates that there is a substantial agreement between the ranking of the six factors of Something About Myself (SAM) between total teachers and total student teachers, between Science teachers and Science student teachers, between Commerce teachers and Commerce student teachers while no such phenomenon is evident in the case of Arts teachers and Arts student teachers.

Comparison of Teachers and Student Teachers

It would be recalled that the creativity instrument Something About Myself was administered on 180 inservice teachers and 180 student teachers belonging to the three fields of Science, Arts and Commerce. Each group had 60 members. The comparison of all the teachers and all the student teachers was done irrespective of subject specialisation. Accordingly, the comparison for the two groups was done by using the t test for samples of equal size (Guilford, 1958). The results of the means, Standard Deviations, and t ratios are presented in Table 53.

Table 53

Summary of Means, Standard Deviations and t ratio of Total Teachers and Total Student Teachers on SAM

Factor	Total Teachers (N = 180)		Total Student Teachers (N = 180)		F	t	P
	Mean	S.D.	Mean	S.D.			
I	3.16	1.61	5.21	1.02	1.50	14.43	Beyond .01
II	2.17	1.39	2.04	1.30	1.14	0.86	NS
III	4.87	2.16	5.77	2.24	1.08	3.88	Beyond .01
IV	5.16	2.39	5.61	2.26	1.07	1.86	NS
V	2.78	1.56	3.34	1.60	1.05	3.41	Beyond .01
VI	2.03	1.31	1.93	1.22	1.15	0.75	NS
Total	24.68	4.34	27.57	3.99	1.18	6.59	Beyond .01

An inspection of the Table under reference revealed that the two groups of inservice teachers and student teachers differed on three factors of the creativity instrument : SAM. There was a significant difference in the total scores of the scale in favour of the student teachers. The factors on which differences were noticed were : Factor I (Environmental Sensitivity), Factor III (Self-Strength), and Factor V (Individuality).

More specifically the following conclusions can be arrived at from the Table under reference :

1. The student teachers are more environmentally sensitive than inservice teachers.
2. The student teachers have more self-strength than inservice teachers.
3. The student teachers have more individuality than inservice teachers.
4. The student teachers have an over all significant edge over the inservice teachers in creative potential.

The raw score means of Something About Myself were plotted in Figure XV. The graphical representation of the data, as shown here clearly demonstrates an overlapping of the SAM factors where there were no significant t differences. Contrary to this there were sharp differences reflected in the curves where there were significant t differences. This representation thus lends further support to the results arrived at.

Discussion

Walter (1967) observes that "the social situation surrounding the practice of any occupation is set to inflict upon the individual whose occupational behaviour is eccentric certain shocks, or trauma." From this it is, perhaps right to generalize that these shocks or penalties or compulsions are the means of enforcing conformity to social/occupational codes. The inservice teachers over the years have, because of the pressures and perhaps shocks, developed a personality configuration to which the new recruits, whatever their qualities, have not been as yet exposed. They do not as yet know how to teach though they may, of course, know what to teach. The student teachers, in short, are ready to teach but not yet formed by teaching itself. It is not, therefore, untenable to conclude from the above observations that the inservice teachers and student teachers would present dissimilar responses to a measure of personality or creative orientations, unique to themselves.

The conclusions presented above have demonstrated that the inservice teachers and student teachers differ on the three of the six factors (fifty percent) of the SAM used in this study. It is obvious that there are no significant differences between the teachers and student teachers on the factors of Initiative, Individuality and Artistry but it is the student teachers who score significantly more than the teachers on the factors of environmental sensitivity, self-strength and individuality.

Besides, the student teachers have a significantly higher mean on the total creativity scale than the inservice teachers.

It would mean that the student teachers are open to the ideas of others, are interested in the beautiful and humorous aspects of experience and have sensitivity to meaningful relations. Again, the student teachers possess self-confidence, are resourceful, versatile and willing to take risks, and have a desire to excel in organisational ability. Lastly they prefer to work alone rather than in groups, see themselves as self-starters, are eccentric and critical of others. They think for themselves and are prepared to work for long hours without getting tired. Overall the student teachers are more creative also. The teachers thus suffer a marked deficit and infirmity in these creative orientations.

The main reason responsible for these results is, perhaps, the lack of teaching experience on the part of the young student teachers. It is not improbable that the inservice teachers once upon a time - at the time of their entrance to the teaching profession - had their unique creative orientations which under institutional pressures rusted, perhaps, corroded.

The schools, it has been pointed out by Perry (1969) consider the teacher education programmes as damaging because they are irrelevant. He, therefore, argues that the young teachers, having been 'inefficiently' trained at college in some aspects of teaching and not at all in others, enters a second training system when he becomes a full time teacher, a training system which although not consciously planned is

nonetheless highly 'efficient'. Perry (1969) comments that both the goals and the training methods, are of the same type as those involved in training for a craft such as carpentry. The training colleges, on the other hand emphasise qualities such as openmindedness, self-criticism, robust optimism that enables one to rush into the difficult and the unfamiliar situations, pessimism that makes one to analyze a problem with cool detachment and self-confidence. It is during the "second training" that the creative orientation receive a crippling blow. Who knows what will the future write upon these student teachers once they take to teaching as a lifelong career.

Besides Gowan (1955) who has carried several investigations with K scale of the Minnesota Multiphasic Personality Inventory (MMPI) with teachers has suggested that it (MMPI) indicates "some degree of social anxiety overlaid with reaction formation in which emphasis is directed towards control of self and adaptation to the needs and demands of others." "Thus teachers in general," write Morrison and McIntyre (1973), "may be more inclined than most to behave in conformity with social pressures which they experience." The social pressures under an authoritarian and dogmatic Indian social system, where the teachers have to scumb, leaves hardly any scope for creativity and originality. Premium is put on conformity and subordination in the educational institutions as argued by Raina (1978). The young student teachers are singularly free from such social pressures as yet. But how long?

Comparison of the Creative Potential
of Teachers and Student Teachers
Belonging to Different Teaching Fields

"There is in no case complete consistency," writes Waller (1967), " but there is a sufficiently heavy aggregation of one sort of personality type in a given profession to justify the assumption of a selectivity affecting the composition of the professional population." From this it would, perhaps follow that between those who are already in the profession and those who are yet to enter the profession there are significant differences in the various parameters that constitute the professional personality configuration or type. One important point that needs attention, but has received little, are the differences between the subject specialisation and the heavy cultural / institutional differences between the veteran teachers and the novices who are yet to take to the teaching as a life occupation. In case the observations are deemed tenable than there may, perhaps, be differences in the creative orientations of the inservice teachers and student teachers belonging to the three fields of subject specialisation, Science, Arts and Commerce taken up for study here.

The purpose of this sub-section, more specifically, is to find evidence relating to the question : What is the extent or agreement / disagreement of the teachers and student teachers of different subject specialisations on a measure of creative orientations : Khatena's Something About Myself (SAM)?

It would be recalled that Something About Myself (SAM) was administered to 180 inservice teachers and 180 student teachers belonging to Science, Commerce and Arts subjects. Each group of teachers and student teachers consisted of 60 subjects each. The means, standard deviations and t ratios are presented in Tables 54, 55 and 56.

Table 54

Summary of Means, Standard Deviations and t ratios for Science Teachers and Science Student Teachers on SAM

Factor	Science Teachers (N = 60)		Science Student Teachers (N = 60)		F	t	P
	Mean	S.D.	Mean	S.D.			
I	3.00	1.74	5.43	1.36	1.64	8.38	Beyond .01
II	1.73	1.43	1.87	1.61	1.27	0.48	NS
III	5.03	1.96	6.65	1.84	1.14	4.71	Beyond .01
IV	6.30	2.49	6.94	1.77	1.98	1.60	NS
V	3.00	1.73	3.86	1.73	1.00	2.69	Beyond .01
VI	1.57	1.23	1.53	1.34	1.19	0.16	NS
Total	24.68	4.49	27.70	3.75	1.43	3.99	Beyond .01

Contd.

Table 55

Summary of Means, Standard Deviations and \pm ratios for Commerce Teachers and Commerce Student Teachers on SAM

Factor	Commerce Teachers		Commerce Student Teachers		F	\pm	P
	(N = 60)		(N = 60)				
	Mean	S.D.	Mean	S.D.			
I	3.20	1.78	5.44	1.12	2.53	8.62	Beyond .01
II	2.00	1.62	1.97	1.50	1.16	0.03	NS
III	5.20	2.13	6.10	2.08	1.05	2.31	.05
IV	4.76	2.24	5.10	2.42	1.17	0.81	NS
V	2.86	1.84	3.14	1.34	1.89	0.88	NS
VI	1.57	1.54	1.37	1.28	1.45	0.77	NS
Total	24.43	4.14	26.25	3.95	1.10	2.46	.05

Table 56

Summary of Means, standard Deviations and \pm ratios for Arts Teachers and Arts Student Teachers on SAM

Factor	Arts Teachers		Arts Student Teachers		F	\pm	P
	(N = 60)		(N = 60)				
	Mean	S.D.	Mean	S.D.			
I	3.14	1.74	5.50	1.14	2.34	9.08	Beyond .01
II	2.24	1.61	1.64	1.54	1.09	0.67	NS
III	4.63	2.51	4.77	2.49	1.02	0.30	NS
IV	4.70	2.18	4.93	2.19	1.00	0.58	NS
V	2.27	1.56	3.03	1.78	1.30	2.53	.05
VI	2.34	1.73	2.20	1.46	1.40	0.70	NS
Total	24.92	4.43	28.77	3.92	1.28	5.05	Beyond .01

Inspection of Table 54 indicated that Science teachers and Science student teachers were significantly different on the six factors measured by SAM. They were factor I (Environmental Sensitivity), Factor III (Self-Strength) and Factor V (Individuality).

It is evident from Table 55 that Commerce teachers and Commerce student teachers differed significantly on two factors: Factor I (Environmental Sensitivity) and Factor III (Self-Strength).

A study of Table 56 again revealed that the Arts teachers and student teachers differed on two factors. They were : Factor I (Environmental Sensitivity) and Factor V (Individuality).

Again it was evident from Tables 54, 55, and 56 that the teachers uniformly are significantly different from the student teachers on the total creative orientations (50 items) of the SAM.

More specifically, the following conclusions can be drawn from the Tables under reference :

- (a) Science Teachers and Science Student Teachers
1. Science student teachers are more environmentally sensitive than inservice teachers.
 2. Science student teachers have more self-strength than Science inservice teachers.
 3. Science student teachers have more individuality than Science inservice teachers.

- (b) Commerce Teachers and Commerce Student Teachers
1. Commerce student teachers are more environmentally sensitive than inservice Commerce teachers.
 2. Commerce student teachers are more environmentally sensitive than inservice Commerce teachers.
 3. Commerce student teachers have more self-strength than inservice Commerce teachers.
- (c) Arts Teachers and Arts Student Teachers
1. Arts student teachers are more environmentally sensitive than Art inservice teachers.
 2. Arts student teachers have more individuality than Arts inservice teachers.

The student teachers of all the three specialities (Science, Arts and Commerce) score significantly higher mean scores on the 50 items creativity measure - Something About Myself (SAM), than the inservice teachers.

The raw score means of Something About Myself (SAM) were plotted in Figures XVI, XVII and XVIII. The graphical representation of the data, as shown here, clearly demonstrate an overlapping of the SAM factors where there were no significant \pm differences. Contrary to this there were sharp differences reflected in the curves where there were significant \pm differences. This representation thus, lends further support to the results arrived at.

Discussion

The importance of creative potential and its actualization cannot be minimized because, "the urge to create is one with the urge for self-expression," (Harold Rugg). The teachers

FIGURE XVII
 PROFILE OF INSERVICE COMMERCE TEACHERS AND COMMERCE STUDENT
 TEACHERS ON SOMETHING ABOUT MYSELF (SAM)

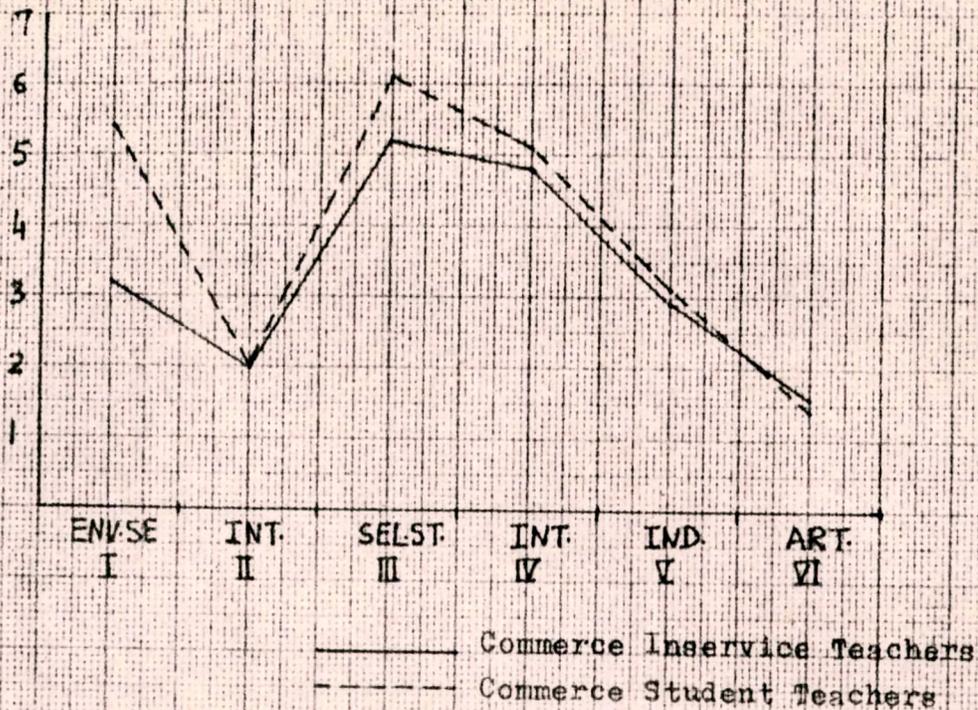
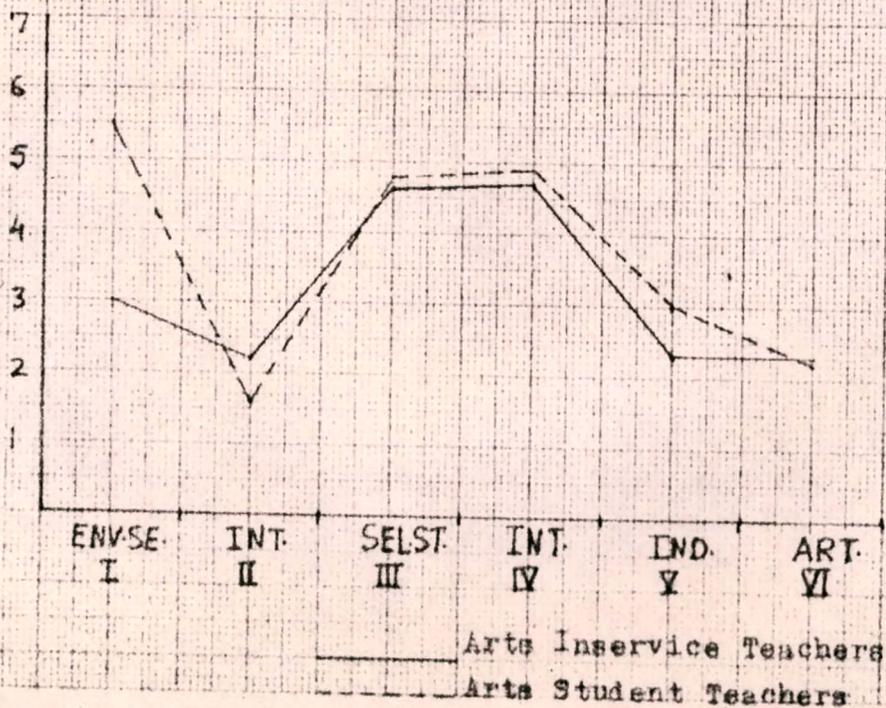


FIGURE XVIII
 PROFILE OF INSERVICE ARTS TEACHERS AND ARTS STUDENT TEACHERS
 ON SOMETHING ABOUT MYSELF (SAM)



and prospective teachers play a significant role in shaping the destiny of a country in her classroom. Creative potential in this study is based on the rationale that it is "reflected in the personality characteristics of the individual, in the way he thinks or the kind of thinking strategies he employs, and in the products that emerge as a result of his creative strivings" (Khatena, Manual, 1971).

The results arrived at in this study have demonstrated that all the inservice teachers irrespective of subject specialisations, are significantly less creative as compared to the student teachers. The reason partly for this phenomenon, as pointed out by Drake (1961), is that with the institutionalization of education a certain amount of restriction may have curtailed the teachers' freedom "to seek truth wherever he may find it." Partly the explanation may be due to the creeping authoritarianism and dogmatism of teachers who have to reflect the social ethos which is, to say the least, authoritarian preventing freedom or what Riesman (1955) called "autonomy" or what Fromm (1947) called "spontaneity." The phenomenon can be explained, perhaps, better in the speculation of Soderbergh (1964) "and we cannot deny that there is abundant evidence to support the suspicion that arteries and opinions hardens pari passu." The inservice teachers are experienced aged men while the student teachers are novices, yet to make a beginning in the profession.

Be that as it may, the implications are not flattering. Can pupils in the classrooms develop their creative potential

under the supervision of the teachers who themselves are not in possession of a favourable creative perception? And what guarantee is there that the student teachers would not be discouraged to teach creatively once they enter the teaching profession. Can the new entrant dare to swim against the current? And if they did, would they be not elbowed out at the earliest opportunity because they "breathed" curiosity and originality in the classrooms. Will they not be fired for not teaching the "fundamentals", like the teacher encountered by Steinbeck (1955).

The second result arrived at was that Science, Commerce and Arts student teachers are uniformly more environmentally sensitive as compared to Science, Commerce and Arts Inservice teachers. It would mean that the student teachers of all the specializations are more open to the ideas of others, relate ideas to what can be seen, touched or heard, are interested in the beautiful and humorous aspect of experience and have sensitivity to the meaningful relations as compared to the inservice teachers. The Science and Commerce student teachers have more of self-strength as compared to inservice Science and Commerce teachers. The picture that would argue is that these student teachers are self-confident, resourceful, versatile, willing to take risks with a desire to excel in organizational abilities. The Science and Arts student teachers again, have more of individuality and prefer to work alone rather than in groups, see themselves as self-starters, are critical of others

and think for themselves. They are prepared to work for long hours without getting tired, as compared to Science and Arts inservice teachers.

It is satisfying that all the student teachers are prepared to have "an open mind, receptive to new ideas and not confined within the prison walls of out-moded customs, traditions and beliefs" (Report of the Secondary Education Commission, 1953). Such a frame of mind will not only tolerate dissent but encourage dissent also. But an important point to note is that receptivity to the ideas of the others (openness to the ideas of the others) must be accompanied by independence of judgement or else the individual would be at the receiving end without contributing anything unique and original. The Science and Commerce student teachers are not doubting souls but can go ahead with self confidence and as youngmen they are ready to take 'calculated risks.'

The Science and Arts student teachers are not group dependent but self-sufficient, with a capacity to criticise and not easily fatigued. They have a high energy level. "But what is more important," writes MacKinnon (1960), "for their (creative individuals) creative accomplishments is the persistent high level of energy with which they work. And this seems possible because, their work is also their play. They do not need to retreat from the work to be refreshed but find refreshment and recreations for themselves in it." The inservice Science and Arts teachers suffer a marked deficit in this direction and the consequence need not be emphasized.