CHAPTER - IV

ANALYSIS AND INTERPRETATION


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(A) TABULATION:

Before coming to any conclusions, a lot of study has to take place. The data collected, by itself, is not able to provide any significant information. So the data is first segregated under different heads and written in table forms.

In this study also, the data was sorted and stored in big tables having names of students on the left hand side, vertically, and questions asked at the top, on the horizontal side. After writing the name of each student, the information given by him was recorded by tick marking the answers chosen by him (See sample table A on page 14).

(1) Separate charts were made for all the these vocations with the help of these charts, the information required for different calculations was again segregated into separate branching tables, which then severed as ready reckoners (See sample table 1 on page 14).

This table gave instant information when such information was required as — How many English medium students underwent coaching? and how many of them were from A or B or C or D type of schooling? In the same way information regarding students belonging to different income groups who resorted to coaching or who went to different
types of schools, was also instantly available and was used in various calculation.

(2) This table was divided into four portions (A) for English medium students whose parents were educated, (B) English medium students whose parents were not educated (i.e., none of them was graduate), (C) for Hindi medium students having educated parents and (D) Hindi medium students not having educated parents.

Each of these four tables was divided into many columns and each 'type of school' was further divided into many columns as shown in sample tables (2) and (2A) on page 46.

This useful reckoner gives instant vocation-wise information regarding with or without coaching students coming from different type of schools (see sample table 3 on page 47).

Once all the data was tabulated in this manner, it could easily be used for various calculations required for analysing the data.
**SAMPLE TABLE - A**

<table>
<thead>
<tr>
<th>Name</th>
<th>1st</th>
<th>2nd</th>
<th>3rd</th>
<th>4th</th>
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<th>7th</th>
<th>8th</th>
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**SAMPLE TABLE - B**

<table>
<thead>
<tr>
<th>Students with English Medium</th>
<th>Students with Hindi Medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>With coaching</td>
<td>Without coaching</td>
</tr>
<tr>
<td>Without coaching</td>
<td>With coaching</td>
</tr>
<tr>
<td>Without coaching</td>
<td>With coaching</td>
</tr>
</tbody>
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**TYPE OF SCHOOLING**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
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</table>

**FATHER'S INCOME GROUP**

<table>
<thead>
<tr>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
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</table>

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### SAMPLE TABLE - 2

<table>
<thead>
<tr>
<th>Taught by Parents</th>
<th>Taught by others</th>
<th>Not taught by any one</th>
</tr>
</thead>
<tbody>
<tr>
<td>with coaching</td>
<td>coaching</td>
<td>without coaching</td>
</tr>
<tr>
<td>without coaching</td>
<td>coaching</td>
<td>with coaching</td>
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<td></td>
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<td>without coaching</td>
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### TYPE OF SCHOOLING

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<th>D</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>A</th>
<th>B</th>
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### SAMPLE TABLE - EA

<table>
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<tr>
<th>A</th>
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### HIGH ACHIEVER OR NOT, PRIOR TO SCHOOLING

<table>
<thead>
<tr>
<th>High</th>
<th>Not</th>
<th>High</th>
<th>Not</th>
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<tbody>
<tr>
<td>High</td>
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<td>High</td>
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<table>
<thead>
<tr>
<th>Other's income group</th>
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H = High income group, M = middle income group & L = Low Income group
<table>
<thead>
<tr>
<th>Name</th>
<th>Yrs 1</th>
<th>Yrs 2</th>
<th>Yrs 3</th>
<th>Yrs 4</th>
<th>Yrs 5</th>
<th>Yrs 6</th>
<th>Yrs 7</th>
<th>Yrs 8</th>
<th>Yrs 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sample</td>
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After collecting and tabulating the data as required, it was subjected to analysis by statistical treatment.

As we have to ascertain the factors responsible for helping students in getting selected to prestigious vocations under study, we will now analyse the effect of these factors one by one, and also interpret the results side by side.

(1) EFFECT OF MEDIUM OF INSTRUCTION (ENGLISH MEDIUM VS HINDI MEDIUM) ON SELECTION

The Data given at the end of this chapter clearly shows that out of all the selected students studied, nearly 77% had their education in English medium and only 23% in Hindi/other languages. On calculating the $\chi^2$ in a 2x2 contingency table, we find that the value of $\chi^2$ is 90.2 i.e. very highly significant rejecting the null hypothesis that medium of instruction has no bearing upon selection of students for vocations under study.

These statistics, however, do not reveal the reason for this situation. On the face of it, we can say that English medium education helps the students in getting selected. Another fact that would back our conclusion is that the entrance-exams to the vocations under study are all conducted in English only. Not only that the professional study imparted to students after selection is also in
English. So a good knowledge of English language seems almost necessary.

Let us try to look at the other side of the coin and discuss the possible reasons for it. Some Hindi medium students, though much fewer in comparison have also been selected. How could they get selected? was it because (a) they possessed sufficient knowledge of English also or (b) is it that fewer Hindi medium students are selected just because there are lesser number of Hindi Medium students in the society today? c) another reason can be that Hindi Medium students shy away from these vocations seeing the predominance of English in them, and very few of them sit in the entrance exams.

When we look around us, we find that the reason (b) mentioned above does not hold true. There certainly are more Hindi/Regional language medium schools than English medium ones, and hence students are also more. But reason (a) and (c) look quite plausible. In an entrance examination conducted in English, only students with reasonably good knowledge of English can get selected and seeing the requirement of English through out the course, Hindi Medium students may be discouraged from trying for these vocations at all.

But all this goes to prove that English medium education does help a student at least in the case of vocations under study. It does not however prove that Hindi
medium students are lacking in knowledge or expertise. It only shows that our country requires an overhauling of the whole society. A social situation where the ‘language’ and not the ‘aptitude’ can decide the vocation chosen by a citizen, is an aberration. But that is the subject-matter of sociologists, social reformers and, to some extent, economists.

An educationist can only strive to impart education, seeing the social requirements and demands of people. So, here it looks as if English language is doing a valuable service to students. Who are certainly benefitting by it.

Now, let us study the situation prevailing in different vocations separately.

First of all we’ll see the situation in IMA –

Out of a total number of 144 trainees, 137 had Eng. Medium, only 4 had Hindi medium and 3 had some other language as their medium of instruction.

Whether the $\chi^2$ is calculated by combining the other languages and Hindi or with only English-vs-Hindi, this remains highly significant only, thus rejecting the null hypothesis that the medium of instruction has no influence on selections. (See Table 1 - A).

In the case of IMA, we see that 95.14% students have studies with English as the medium of instruction and only
4.86% with Hindi or some other language, leading us to believe that one has a chance of selection with English language only.

But when we look at other vocations, we find the situation quite different. In the Engineering University, Roorkee, out of a total of 80 students 54 are with English medium and 26 with Hindi medium i.e. 67.5% with English and 32.5% with Hindi/other languages. The difference is quite a lot by English leading with a wide margin. (see table i-B Dia-1).

The $\chi^2$ is also significant (9.8) rejecting the null hypothesis but the situation is very different in medical college, out of 69 students 36 i.e. 52.17% have had English medium in school while 33 i.e. 47.83% had Hindi medium. As is obvious, this difference is not very much and the $\chi^2$ of 0.13 is also not significant, even at .05 level (See Table 1-C). So here we can accept the null hypothesis and say that the medium of instruction at school level, plays no significant role for a student's selection to the Medical College. (See diagram - 1)

Now, how can we analyse this difference in the three chosen vocations? As far as studies during the training period are concerned, all the study is done in English medium only, in all the three vocations. The entrance exams are also conducted in English in all three then why this disparity?
For IMA it may be the S.S.B. (Service Selection Board) that may be the decisive factor, as the interview is conducted in English only and candidates are expected to converse and express all their feelings and ideas in fluent English.

In this kind of a situation candidates not good in spoken English do not stand any chance of selection; and only those candidates can have good spoken English who have been brought-up in an English-speaking environment, in school and at home. Hence, we can say that in the Army the situation is biased towards English only, resulting in this predominance of English-medium candidates. Further research will be required to throw light on the subject. But on combining the data for Medical College and Engineering University; leaving aside IMA; we again find that English is predominant as we get $\chi^2$ of 6.44 which is significant at 0.01 level at one degree of freedom thus rejecting the null hypothesis of no relationship between the two variables.

So, we can safely conclude that English medium students do have a better chance of selection to those prestigious vocations compared to Hindi medium or regional language ones.

(ii) **EFFECT OF TYPE OF SCHOOLING (Vocation-wise)**

Our prime concern is to see the contribution to the three prestigious vocations of our society, made by different types of schools with the aim to find out whether the schools with a large number of facilities to students, along with English medium education do really help a student in life or not.
We know that in some of the developed countries like America, parents are involved in their child’s school activities to a very great extent and the stress on student-independence and games etc, is quite large. That is a kind of situation which we think of achieving but at present no school in India is involving parents to the extent of taking their participation in school activities but still many schools are trying hard to provide various kinds of experiences to students with the expressed AIM of all-round development of their personality.

Some such schools are charging enormous amount of money from parents and in some, like sainik schools, Central schools etc, the expenditure is being born by the government. Our study and the analysis of our data will help us in finding out whether this expenditure and the mad rush of today to get admission into such a school is really worth it or not.

When we analyse our own data, we find that out of a total of 294 trainees, 65 (or 22.1%) are from government colleges, 64 (22.6%) are from central schools, 63 (21.4%) are from private aided schools and 82 (27.9%) are from Public/English medium schools. (Dia 2)

This situation reveals that maximum contribution to these vocations is from Eng./Public schools or Central schools and the contribution made by Government colleges and private aided schools is comparatively quite less and almost equal to each other. It leads us to conclude that some facilities provided by Central schools, like co-curricular
activities, less teacher-pupil ratio, good library and lab facilities, educated staff etc. do help the student but other facilities like swimming, riding and all other nonacademic activities may not be contributing to the success of a child because otherwise, Logically, the contribution of Public/Eng. medium schools should have been substantially more than that of Central schools. We here see that the contribution of Central schools is almost at par with these schools thereby telling us that, the amount of facilities provided by such schools are sufficient.

It means, there is a requirement of upgrading other types of schools to the level of Central schools at least. We will discuss the facilities provided by Central schools and other schools later. At present, let us proceed further and see what is the situation like in various vocations.

[A] I.M.A:

We are familiar with the theory propounded by Gestalt psychologists that 'whole' is not always a summation of its parts, so it is essential that we study the situation prevailing in these parts separately and see whether the 'whole' resembles its parts here or not. Is it that a particular type of vocation attracts the students of a particular type of school or the situation is homogeneous in this regard. Let's take the situation in IMA first. Out of total of 144 subjects studied, the bulk of the contribution, that is 66 (45.8%) have come from Central schools, 43
are from private aided schools and the least number, i.e. 13 (9%) are from Government colleges. It shows that the environment provided by Central schools is the most conducive to students opting for Army. (See Dia 2)

But apart from the schools atmosphere, the atmosphere prevailing at home may also be a contributing factor. It has been seen that most of the students studying in Central schools are children of defence personnel and hence they may be more familiar and at home in the Army atmosphere making them more inclined to join the same; whereas the children of persons in business or non-transferable jobs may not be attracted towards Army life with frequent transfers, light finances, likelihood of war and other exigencies of services disrupting peaceful family life.

[B] ENGINEERING:

On looking at the situation in Engineering University, we find that out of a total 89 trainees, the maximum number, i.e. 28 (34.6%) are from Private aided schools; 25 (30.9%) are from Government colleges; 17 (21%) are from Public/English medium schools and only 11 (13.6%) are from Central schools. (See Dia 2)

Here we see that the situation has been reversed, which can only lead us to believe that either the environment prevalent in Central schools and Eng/Public schools is not
very conducive to serious studies required for Engineering
where as Pvt. aided schools and Govt. colleges provide a
better atmosphere. But we know that Government colleges are
beset with many problems like, 'LACK' of funds resulting in
lack of equipment, 'books in the library and other things
which are considered essential in a good school. Apart from
this they are overcrowded, teachers are underpaid and lack
of motivation and discipline problems are common place.
Apart from all this, teachers of good calibre are also not
attracted to these schools because of less remunerations and
lack of other perks and facilities given to them. On the
other hand central schools as well as most of the
Public/Eng. medium schools attract more qualified teachers
and are well-equipped as regards books, equipment in the
labs and games & sports departments etc. So it can not be
said that the situation is not conducive to studies in these
schools or is less so compared to Government Colleges or
even Private aided schools so there must be other factors at
work. We will analyse the other contributing factors later.

[C] MEDICAL:

Now let's study the situation in Medical College,
Jhansi. Students come here from all over India and even from
foreign countries.

Out of a total of 69 students, the maximum number of
students are from Government colleges i.e. 27 (39.1%); 22
(31.9%) are from public/Eng. Medium schools 13 (18.7%) are
from Private aided schools and only 7 (10.1%) are from Central schools.

Here also, we see that bulk of the students are from Government colleges but the situation is different from Engineering, as, there, Public/Eng. medium schools are not a major contributors, but in the Medical college they are. But in both Engineering as well as Medical, Central-school contribution is the least where as in IMA it is the maximum (See diagram2).

(iii) EFFECT OF RESERVATION

Let's see the effect of the factor of Reservation on this whole situation.

IMA does not follow the policy of reservation so the selection is purely on merit; but in Engineering University Roorkey and Medical college, Jhansi many students have been selected on the seats reserved for SC/ST/OBC, etc. Out of a total 78 students who responded to this query in the Engineering University, 19 (i.e. 24.4%) were from the reserved category, and in the Medical college, Jhansi, out of a total of 69 students, 20 (i.e. 29%) belong to reserved category.

We all know that reservation is not the correct criteria for selection; it is not true selection and so it may distort the picture. So let's see what the situation is like with only the general category students (see Dia.3). We have excluded the trainees at IMA from this study as there
are no reserved seats for any of the reserved classes. In the Engineering University, out of a total of 59 General category students the maximum contribution has been made by Government college and Private aided schools with 19 students each (i.e. 32.2%) coming from these, Eng-medium/public schools are not very far behind with 15 students (i.e. 25.4%), but the contribution of central schools is only 6 students (i.e. 10.2%). On comparing this information with the one already available including both General and Reserved categories we find that the situation is almost the same as, there also, the major contribution is by Government colleges and Private aided schools only, Eng.-med./Public schools are at the second place and Central schools are the last. It means reservation has had no effect on the situation.

Let's now study the situation in the Medical college, excluding the reserved candidates. We find that out of a total of 49 General category students, the maximum contribution is by Eng. Medium/Public schools with 18 students (i.e. 36.7%); contribution of Governement colleges is almost the same with 17 students (i.e. 34.7%) the contribution of private aided schools and central schools is almost the same with 8 students (i.e. 16.3%) and 6 students (i.e. 12.2%) respectively. On comparing this analysis with the earlier analysis (including both General as well as the Reservererd categories) we find that, though the bulk of students are from Government colleges and Eng-medium/public
schools only but here English Medium/Public schools are ahead of Government colleges with a slightly bigger contribution; the difference between the contribution of Private aided schools and central schools is very little though central schools are still contributing the least no. of students.

This whole discussion does not reveal any set pattern of selection to the vocations under study except that probably central school students have a bias and advantage for selection to IMA. There can be many reasons underlying this phenomenon which we will not discuss here.

(iv) **EFFECT OF INCOME LEVEL:**

Now we will discuss another aspect of the same problem namely, what was the income group of the parents of students belonging to different schools and also to see what percentage of students were selected in various vocations from different income - levels. For this let us divide the whole population into three income - levels - (1) Low - income group comprising of people having income below Rs. 3000/- per month (2) middle income group having income between Rs. 3000 and Rs. 10,000/- per month and, (3) the high income-group with monthly income of Rs. 10,000 or more. (See dia4).

We find that out of a total of 65 students belonging to Government colleges, the bulk of the students i.e. 40 (61.54%) are from middle income group, about its one third i.e. 14 (21.54%) are from Low income group and only 3
(4.62%) are from the high-income group where as 8 (12.3%) are silent on this point. (See Dia 5)

In case of Central school students, out of a total of 84 students the share of middle-income group is even greater i.e. 61 (72.62%) the share of low-income group is smaller, i.e. 15 (17.86%) and that of the high income group is very very small with just 2 students out of 84 (2.4%) where as 6 students (7.14%) are silent on this point (Dia 5).

The situation in case of private aided Schools is almost the same with the share of middle income group out of a total of 63, being the maximum with 46 students (73%) that from lower income group being 11 (17.5%) with a slightly bigger share coming from the high-income group with 6 students (9.5 %). (See Dia 5)

The situation is slightly different in case of Public/English medium schools with, out of a total of 82 students, the share of the middle-income group being the maximum compared to all other types of schools, with 71 students (86.6%) and the share of low-income group being the smallest compared to other types of schools, with only 5 students (6.1%) and only one student refusing the information. (Dia 5).

When we look at the over all picture, we find that out of a total of 294 cases studied, the maximum number i.e. 74.15% or 218 students come from the middle-income group.
only having monthly income between Rs. 3000/- and Rs. 10,000/- Approximately one fifth of this number i.e. 15.31 % or 45 students belong to the low income group and just 5.44% or 16 students belong to the high income group, with 5.1% or 15 students not giving any response to this query (Dia 4). Now, what could be the possible reason for this occurrence? May be it is so because, as most of the sociologists contend, that the middle class people have the maximum motivation to work hard and do better and better in life. It is said that the aspirations and ambition of the low-income group are not very high. There are many reasons for it including lack of proper facilities and study atmosphere at home, but we will not discuss these here. It is also said that due to easy availability of material means of wellbeing and abundance of money and luxurious life, the motivation to work hard is low in the high income group also. Reasons are many, like, preference for other types of careers, already prosperous family business etc. We will not discuss these reasons here. The middle-income group students may be having the maximum ingredients, like parental support, proper study atmosphere, incentive to achieve something in life, non availability, but the desire to achieve a luxurious life etc. that is why maximum number of students belong to this category. We’ll study the other factors influencing the selection of students, like education of parents, parents’ efforts in teaching the students at home, effect of coaching etc.
If we cast a look at the three vocations separately also, we find that the three vocations are not attracting students from separate income groups but all the three have got the major portion of their students from the middle-income group only. But out of a total of 16 high income group students, maximum number, i.e. 11 (15.3%) have gone to Engineering though the data is insufficient to draw any conclusions. (See dia.6)

(v) EFFECT OF PARENTS’ EDUCATION:

Now, let us study whether the education of parents (till graduation) has had any effect on the selection of these students, or these two are not related.

We find that out of a total of 294 selected students 261 (88.8%) had either both or at least one educated (graduate) parent and only 30 (10.2%) who did not have educated (i.e. graduate) parents. The $\chi^2$ of 186.24 is very highly significant rejecting the null hypothesis that education of parents has no influence on a child’s selection to a prestigious vocation (Tab 2: dia 8).

We can explain if by the fact that educated parents understand the importance of education and so they help and encourage their children to study well. They are willing to spend money and provide proper facilities and study atmosphere to their children, whereas uneducated or less educated parents do not take their children’s study very seriously or they may find many types of educational
expenditure as waste-ful or unnecessary. This conclusion is not based on the present study as the data here is too insufficient to reach any generalization but it is a prevalent notion in the society and is based on various studies conducted by sociologists and educationists. Our present study is only helping to corroborate this notion.

(vi) **EFFECT OF HELP AT HOME:**

Now let us cast a look on how many parents insist on teaching their children themselves at home and whether this fact helped these children in their studies or not. As we can see here, 149 students (50.7%) were taught at home by their parents whereas the rest i.e. 145 (49.3%) were either taught by some other family member or a private tutor or they were not taught by anybody (which we have taken to mean that they did self-study). So we see that whether children are taught at home by parents themselves or not, has very little bearing on the study and selection of students. The $\chi^2$ of 0.054 here is very insignificant thus accepting our null hypothesis that being taught by parents personally has no influence on selection of a student to these vocations (Table 3). The essential thing is that the child should be taught by someone, as is evident from further analysis of the collected data, revealing that out of a total of 294 selected students in the three vocations 251 (85.4%) were taught by someone at home, i.e. either his parents or some other family member or a private tutor etc., and only 43 (14.6%) who were not taught by anybody. The $\chi^2$ of 147.16 is
very highly significant here, rejecting the null hypothesis out-right, that there is no relationship between a student's selection and his being taught at home by someone (Tab. 4). Still the present data is no proof that the less number of students left on their own to study, among the selected ones, is due because such students are not able to cope-up with their studies on their own. Here some other factors may also be at work, like, may be this situation is due to the fact that most students in the total population do have somebody teaching them at home and students with no help at all are, as it is, in very small percentage of the total student population and, the same situation is being reflected in our sample also. More study is required to draw any conclusions in this regard. From our present study we can say that educated parents and somebody to help the children with their studies at home do influence their future prospects. But there may be other factors at work also, like coaching taken, type of schooling, student's own aptitude reflected in the percentage marks he achieved in the school exam etc. Let us study these situations one by one.

(vii) **EFFECT OF COACHING:**

In today's scenario coaching seems to be a very potent factor helping the students in selection. The researcher would like to study this factor in detail. In this regard we shall also study if there is any co-relation between the
parents' education and the coaching taken by the students to see whether the children of educated parents opt for coaching for selection more or less compared to the children of uneducated (none of the parents graduates) parents.

But before that we must also know the effect of coaching on the selection of students. For this we must, first of all know how many students, in total, are with coaching and how many are without coaching.

A total of 291 students out of 294 responded to this query: and out of these 291, 134 (45.6%) students took some form or the other of coaching prior to their selection, but 157 (53.4%) have been selected without any coaching. When we put these values in a 2 x 2 table and apply statistical treatment to it, we get a $\chi^2$ of 1.82 which, at 1 degree of freedom, is not significant. It means that our null hypothesis of no relationship between coaching and selection, is true (Tab. 5 and Dia 8).

Now, if this were true, we wouldn't be seeing such a mushrooming of various coaching centres all over the country, in every city and town, claiming guaranteed success to students coached by them. They even publish various data to corroborate their claims. It is a generally prevalent notion also that before any competitive exam, a student should take proper coaching for selection. Coaching centres are much in demand and are flourishing. Almost all the students around us seem to be taking coaching classes for one competitive
exam or the other. Then why is it that our study is telling us something which is opposite to what we see around us?

Of course there are many other factors also influencing the selection, apart from coaching but we must clarify all our doubts regarding the contribution of coaching. For this we will have to study, the situation prevailing in the three vocational courses separately to see if coaching has any influence on selection to any of them individually. (Dia 7)

We find that in IMA, the bulk of the students i.e. 117 out of 142 (82.4%) have not had any formal coaching and only 25 (17.6%) took coaching.

On putting these frequencies in the 2x2 contingency table and subjecting this data to proper statistical treatment we get a \( \chi^2 \) of 59.6 which is very highly significant, thus rejecting our hypothesis of ‘no relationship’ between ‘coaching’ and ‘selection’. (Table-6). But while reaching any conclusion we must remember that in IMA most of the students are ‘without’ coaching telling us that if there is any relationship it is between ‘no coaching’ and selection. It means that coaching has an inverse relationship with selection; that is, a person with coaching will not be selected and one without coaching only will be selected (Dia-7). Now, the absurdity of this conclusion is self-evident. This is like saying ‘eating induces hunger’ and ‘not eating satisfies hunger’. This thing goes totally against known facts, logic and common
sense, so we will have to search for an appropriate explanation for this phenomenon.

We can say that most of the students appearing in the selection exam of IMA do not take coaching and hence there is a higher percentage of them among the ones selected. But a question may be asked that why do IMA candidates shy away from coaching, specially when in today's world, coaching has become a significant part of a student's life till he selects a profession? We will discuss this point again after some time. Here it is sufficient to say that, since coaching can not have a negative effect on a student's performance, we can say that coaching is not helpful in selection to IMA.

Now we should take-up the situation prevailing in the Engineering University. Here we see that out of 80 students, 54 (67.5%) have undergone coaching and 26 (32.5%) are without coaching. Here, clearly, more students are 'with' coaching than without it (Dia-7). On putting this data in the 2X2 table, we get a $\chi^2$ of 9.8 which is clearly significant, rejecting our hypothesis of no relationship between coaching and selection. So we can say that coaching does help for selection to Engineering, though there may be other factors also like the student's own calibre and intelligence, effect of educated parents, effect of good schooling, proper motivation at home etc; which may be working in the same direction (table 7).
Let us now take-up the case of Medical college. Among 69 students 55 (79.7%) i.e. a higher percentage than even the Engineering students, are with coaching and only 14 (20.3%) are without coaching (Dia-7). On giving the same statistical treatment to this data also we get a $\chi^2$ of 24.4 which is very highly significant thus rejecting outright our hypothesis of 'no relationship' between coaching and selection (table 8). Here again, like for Engineering, there may be many factors helping a student but coaching certainly, it looks, is one of them.

This whole discussion tells us that if we do not include IMA in this analysis then the selection of students shows a significant relationship with coaching and it is IMA only showing an inverse relationship with coaching which is affecting the calculation of all the 291 students (all the three vocations) and making the relationship 'not significant' with a $\chi^2$ of 1.82. IMA can be called an exceptional place where coaching is not helpful (Table 5).

We know that for selection to IMA, not only a student's knowledge and academic competence but his total personality, including his physical health and attitude towards life etc. are also judged and they have specialised physical and psychological tests for the same, including an interview in front of a board comprising of many members. We also know that any short term coaching can not alter the personality of a child. Probably this is the reason very few students undergo coaching for IMA, hence the less percentage of them
is selected. But in both the other vocations only the knowledge and academic competence is required to get selected, there being no psychological or physical test and no interview, students are able to improve upon their knowledge of the subject and so coaching is helpful to them.

One more phenomenon is at work during the IMA selection, which again goes against coaching. It is common knowledge that any type of formal coaching, with the specific aim of selection to IMA, is not appreciated by the selectors, as it gives students an 'acquired' behaviour where as IMA selectors seek to judge the original, basic nature of a person. So it may be that students do not undertake coaching not to jeopardize their selection; or, may be, they do take coaching but are reluctant to tell for the same reason.

So, seeing the entirely different types of requirements of these different vocations, it is better if we study the effect of coaching on IMA trainees and those in other vocations separately.

viii PARENTS' EDUCATIONAL STATUS AND COACHING

Now, as we had decided earlier, we shall study the relationship of parents' educational status with coaching required by students to get selected.

Today our Government is putting a lot of effort into making the adult education programme a success. The need to
educate the adults has been felt not only because it will enlighten our uneducated masses and improve their understanding of the world around them, but also because it will help in the education of the next generation. Maximum number of uneducated people are found in the economically weakest sections of the society, and the situation is not improving very fast despite the availability of free education and despite a ban on child labour.

This situation prevails, to a large extent, due to the fact that parents of these children do not understand the importance of education. They do not feel that education is going to make any contribution to their children’s wellbeing. And it always happens in case of uneducated parents.

Many studies have been conducted and it has been found that educated parents are more aware of the need for education and they would do everything in their power to provide proper education to their children. Educated parents are also able to help their children in studies at home. On the basis of this fact only we want to find out whether the graduate level studies of parents help a child in his studies, or not. For this we will study whether the children of educated (graduate) parents also have to take coaching before selection, to the same extent as the other children (whose parents are not graduates) or they do it to a lesser extent.
On analysing the collected data we see that out of a total of 261 students with educated parent 118 (45.2%) have had some form of coaching before selection whereas 143 (54.8%) have been selected without any coaching and out of 30 students whose parents are not educated, 16 (53.3%) are with coaching whereas as 14 (46.7%) are without coaching (Dia 8). On putting these vocations in a two fold contingency table and subjecting it to proper statistical treatment we get a $\chi^2$ of .7 which is not significant at both .01 and .05 levels, so we should accept our hypothesis of null that the educational status of parents has no relationship with the coaching undergone by students for their selection (Table 9). We had earlier seen that the situation in IMA is exactly opposite to that found in Engineering and Medical, regarding coaching. So let us study the situation prevailing in Engineering University and Medical College together and that in IMA separately.

After proper calculations, we find that for Engineering and Medical students, combined the $\chi^2$ is .027 and the $\chi^2 = .104 \ (N=149)$ which is not significant, accepting our Null hypothesis of no relationship between parents' education and coaching (Tab-9B).

In case of I.M.A, the $\chi^2$ comes out to be .046 and N is 142, so we get a $\chi^2$ of .3 which, again, is not significant. Here again our hypothesis that parents' education and coaching are not related, is accepted (Tab. 9A)
Thus we see that in Engineering + Medical and IMA separately also, no significant relationship exists between the education of parents and coaching. It means that if students take coaching before their selection exams, they do so due to some other reason and not because their parents are not educated or educated. These 'other reasons' can be that coaching is a specialised education with a specific aim. Coaching is not imparted with the aim of increasing the over-all education of students but it is for the sole purpose of qualifying in a certain specific competitive exam. Parents may be able to help students with general studies but this type of teaching they can not provide at home. Coaching centres keep a track of the examination - patterns of competitive exams; the type of questions asked there, the inclination of these exams towards one subject or the other etc. and they provide coaching according to the same. The competition is so fierce that students do not want to leave anything to chance and don’t want to leave any stone unturned, that is why maximum number of students take coaching, irrespective of the educational status of their parents. We had earlier studied that coaching does help the students in vocations like Medical college and Engineering, but there are many students who are selected without any coaching also. Then why is it that many students have to take coaching? We have already eliminated any relationship between the parents’ education and coaching.
We have also concluded earlier that the maximum contribution to these vocations is from Pub./Eng. medium schools and Central schools. We know that coaching is taken by students to increase their knowledge and improve their performance in the test. Now if we say that Public/Eng. Medium or Central Schools help a student in future selection to these vocations then it also follows that students having studied in these schools should be less dependent on coaching compared to those who studied in Government colleges or private aided schools. Let's analyse the data and find out what the situation actually is. For this, we will have to divide the school into two groups. The first group or group A containing the Public/Eng. Medium schools and Central school students and group B having Government colleges and privates aided schools. (See dia 9)

We find that out of a total of 166 students belonging to pub./Eng. medium schools and Central schools (i.e. gp-A) 60 (36.7%) are with coaching, 4 have not responded and 102 (35.2%) are without coaching and out of a total of 128 students in group B, 73 (25.2%) are with coaching and 55 (19%) are without coaching. On calculating the relationship between the two we get a $r$ co-efficient of 0.2 and a $r^2$ of 11.6 which is significant at both the .05 and .01 levels (tab 10). It means our null hypothesis that there is no relationship between the type of schooling and whether students have to undergo coaching, stands rejected; but of
course, we can not straight away conclude that group A schools somehow help the students in their selection, to the extent that they can be selected without any extra coaching.

But as we have seen earlier the situation is entirely different regarding coaching in case of IMA candidates; so we should study the situation in IMA separately from that in Engineering and Medical college. We can do this here by first putting separately the students belonging to different schools, and deviding them into 'with coaching' and 'without coaching' groups.

This will provide us a comparative estimate of all the four types of schools and show us their effectiveness vis a vis coaching. Now, to segregate the IMA candidates, we can further devide the 'with' and 'without' groups belonging to each type of school into the groups of students selected to different vocations. (See dia 10).

We find that maximum number of 'without coaching' students are from Central Schools, the next big share is of Eng/Pub. Schools, the next are Private-aided schools and the least number is from Government colleges. But side by side, one more interesting phenomenon is also visible here, that the contribution of students to IMA, is also in the same order, that is, the maximum number is from Central Schools, then from Eng./Pub. schools, then from Private-aided schools and the least number is from Government colleges. (See dia
10). This analysis clearly shows that more the number of IMA candidates belonging to a school, more is its, percentage of without-coaching students. And if we take into consideration only the Engineering and Medical students, the share of without-coaching students becomes very less, showing thereby that coaching does influence selection keeping aside an exceptional case like IMA, which due to entirely different requirements, does not encourage coaching by its candidates.

As we have already calculated a $r'$ of 11.6 to show the relationship between the type of schooling and coaching for all the students it follows that we should do the same for the students belonging to the three vocations separately too (Tab. 10).

First of all, taking-up the case of IMA candidates, we see that out of 107 students from group A schools 90 are without coaching and only 17 are with coaching.

In the second group, that is students from group B schooling, 27 out of 35 are without coaching and only 8 are with coaching. When we put these values in a 2 x 2 table and calculate the relationship we get a $r'$ co-efficient of .08 and a $y'$ of .85 which is not significant at D.F. = 1, accepting our null hypothesis that there is no relationship between good schooling and coaching (tab. 10-A). But seeing the predominance of 'without coaching' students, we can say that one does not require coaching for selection to IMA,
irrespective of the schooling.

In case of Engineering students, out of 28 students from group A schooling, 21 are with coaching and only 7 are without coaching. Like wise, out of 52 students from group B schooling, 33 are with coaching and 19 are without coaching. After suitable calculations, we get a $\gamma$ co-efficient of 0.1175 and a $\chi^2$ of 1.12 (N is 80 here). This value of is also not significant and so we have to accept the hypothesis of no relationship between 'type of schooling' and coaching (tab. 10B). Here we see a predominance of with coaching students, which tells us that for selection to Engineering, one has to take proper coaching, whichever type of school one belongs to.

The third case is of Medical college students. We see that of 29 students from group A schooling, 23 are with coaching and just 6 are without coaching. In the same way, out of 40 students from group B schooling, 32 are with coaching and rest 8 without coaching. This data gives us a $\gamma$ co-efficient of .0085 and a $\chi^2$ of .005 which is very insignificant, so we have to accept the hypothesis of no relationship between the type of school one has studied in, and coaching (tab 10 C). Here again 'with coaching' students are in a big majority leading us to conclude that for selection to the medical profession also, coaching is essential, no matter what type of schooling one has had.

We see that within each vocation there is no
relationship between the type of schooling and coaching. All this detailed discussion has told us that it is the vocation one is going to join which determines whether one has to take coaching or not, and not the type of schooling one has had.

This conclusion is very interesting and very important also as it throws a very significant light on our total study. In this study, we basically want to know whether the type of schooling one has had, has any influence on a student’s future prospects of selection to a prestigious vocation in society or not. For this, we first had to ascertain the influence exerted by other factors like coaching, parents’ education, economic stratum one belongs to, academic capability of the student himself etc. So now at least we have come to know that schooling is independent of coaching. Had it been related to coaching it would have meant that coaching and schooling work side by side and a student who had not had a good schooling would have had to take coaching for getting selected in competitive exams. But now we know that if a student takes coaching for selection it is not because something was lacking in his school but because of the special preparation required for selection to his chosen vocation. And in case of vocations where coaching is of no help, he will not take coaching. In other words, it means that, though schooling does exert an influence, which is evident in the predominance of students from Central schools and Public/English medium schools. In the three selected vocations, the coaching taken by students
does not depend upon their schooling, but on the demands made by their chosen vocation.

In IMA we know that out of a total 142 trainees who responded, 25 are with coaching and 117 are without coaching. Out of these 25 students with coaching 17 (12%) are from type A schools and 8 (5.6%) are from type B schools. In the same manner, out of 117 students without coaching 90 (63.4%) are from group A school and 27 (19%) are from group B schools (Dia 13). On subjecting this data to statistical treatment, we get a $\chi^2$ co-efficient of .08 and a $\chi^2$ of 0.85 which is not significant at 1 degree of freedom (Tab. 10 A).

In case of Engineering University too, out of a total of 54 students with coaching 21 (26.3%) are from group A schools and 33 (41.2%) are from group B schools, whereas out of 86 Without coaching students, 7 (8.8%) are from group A schools and 19 (23.8%) are from group B schools (Dia 13). In this case, we get a $\chi^2$ co-efficient of 0.1175 and a $\chi^2$ of 1.12 which, again, is not significant. (Tab 10B).

Last of all, in the case of Medical college also, out of 55 With coaching students, 23 (23.3%) belong to group A schools and 32 (46.4%) belong to group B schools and out of 14 Without coaching students 6 (9.7%) belong to group A schools and 8 (11.6%) belong to group B schools (Dia 13). Here, we get a $\chi^2$ co-efficient of .005 and a $\chi^2$ of .005.
which is highly insignificant. (Tab. 10C)

Thus, again, we find that there is no relationship between the type of schooling one has had and coaching.

But while we are at it, we must not forget that some students are high achievers, with better academic aptitude, and some are low achievers. This fact, coupled with the fact that most of these so called good schools follow the selective admission policy whereby admission tests are given and only selected students are given admission in the school. It follows that such students may be so good themselves that they would not require any coaching in which ever school they may study.

Now let's analyse the situation and see how many high achievers in school have had to undergo coaching for selection to the vocation of their choice. For this we will first divide all the students into two categories, 'high achievers' and 'not high achievers,' the former category containing students who scored 70% or more marks in their school exam and the second category having students scoring marks less than 70%. The mid-point has been taken as 70% because, though the first division starts at 60% we have to take a percentage sufficiently high, which we can assume to be representing high achievers, without any doubt.

We find that out of a total 294, 7 students are silent on the subject where as 287 have responded, and out of these 287, 136 are high achievers out of which 73 have taken
coaching and 63 have not. 151 are not high achievers out of which 59 have taken coaching whereas 92 have been selected without any coaching (dia 11) On putting these values in a four fold table, we get a $\chi^2$ of -.15 and a $\chi^2$ of 5.74 which is significant at .05 and .02 levels but not at .01 level. It means, this value can not occur by chance more than twice out of a hundred times; so our null hypothesis, that the academic achievement of a student revealed in his percentage marks obtained in twelfth class exams have no influence on whether he has to take coaching or not, stands rejected (Tab.11).

But strangely enough, when we subject the data of all the three vocations separately to statistical treatment, the $\chi^2$ comes to be 'not significant' in all the three, thus accepting the null hypothesis in all the three, that whether a student takes coaching for selection or not is independent of his academic achievement, reflected in his percentage marks obtained in 12th class (See tab 11A and tab 11B).

Hence we require more data to draw any concrete conclusions.

(x) **SELF INTEREST AND SELECTION**

Out of the many factors that contribute, or we can say, help the students in their selection to the vocations under study, one factor can be the 'desire' of the student himself to opt for that particular vocation. The desire or interest, or determination to enter a specific vocation makes a
student Focus and he prepares himself accordingly. This may be the motivational force behind his all other efforts. So, our study will be incomplete if we do not look into this aspect over in detail.

There may be many reasons for a person opting for a vocation.

We know that in our country people are very rarely able to choose a profession according to their aptitude and interest. Due to the huge problem of unemployment people are very often forced to be content with what they get rather than what they want. Competition is very fierce for entrance to any vocation, so students keep trying for as many vocations as possible by appearing in their competitive exams and are content with which ever vocation they are selected in.

Familiarity with a particular profession also may play a role in the choice of vocation by a student. When children see their father, mother or some other family member doing well in a profession, they are also motivated to join the same and hence try for it. Then, familiarity with a profession also contributes. Each profession brings with it a certain type of atmosphere at home also, and we all know of the human tendency to remain in familiar atmosphere. Many times we come across reknowned doctors whose sons/daughters also became doctors; business men whose children carry on their father's business only; teachers whose children opt
for teaching as a career though few people from other walks of life want to take-up this profession out of choice seeing the meagre earnings of teachers etc. Apart from these there can be any number of other reasons affecting an individual's decision to join a particular profession. We must discuss at least the prominent reasons here. For this, let us segregate the 288 students who responded to this query, under three headings:

(1) Those who chose their vocation because their father, mother or some other family member was in it.

(2) Just because they got the opportunity to join it. We must understand that here only those students will join who are not very particular about the vocation of their choice. Many times students do not even have a clear focus to achieve something in life. In the researcher's opinion most people in the country fall under this category today. The first and foremost concern of people today is to find a vocation which would give them sufficient earnings to live a comfortable life side by side giving them a status a prestige in society. So, as soon as they get a chance to join a profession fulfilling these requirements, people opt for it.

(3) There can be hundreds of other reasons which may differ from individual to individual depending upon the family circumstances, expectations of family members, place (City/Town etc.) where a person may have to live to pursue
it, the finances required to undertake the required training
the time period required before their earning can commence
and of course the personal interest of an individual etc.
Since all these reasons are not general in nature, they can
be put together and given a heading "other reasons".

On segregating the students under the above mentioned
three groups we find that only 72 (25%) have opted for their
vocations because their father, mother or some other family
member was in it; 91 (31.6%) have opted for it just because
the opportunity presented itself and 125 (43.4%) have given
"some other reason" as the cause (see dia12).

It clearly tells us that reason no. 2 is a major
factor, influencing the decision of people in joining their
chosen vocation though familiarity due to father/mother or
some other family member being in the same vocation is not
far behind.

Thus we see that there are many factors contributing
towards the selection of students to prestigious vocations
and no one factor alone can be given the credit.
Ho = Medium of instruction has no bearing upon the selection of a student to a vocation.

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<th>Hindi Medium</th>
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<td>Fe</td>
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<tr>
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<td>Fe</td>
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\[
\chi^2 = \frac{(\text{Fo} - \text{Fe})^2}{\text{Fe}}
\]

\[
= 90.2
\]

At, \( df = 1 \), This value of \( \chi^2 \) is very highly significant, thus rejecting our null hypothesis.
**Ho** = Medium of instruction has no bearing upon a student's selection to I.M.A.

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\[
\chi^2 = 117.4
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At df = 1, This value is highly significant thus rejecting our null hypothesis.
Ho = Medium of instruction has no bearing upon a student’s selection to engineering.

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\[
\chi^2 = 9.8
\]

At df=1, this value of \( \chi^2 \) is significant at .01 level, thus rejecting our null hypothesis.
Ho = Medium of instruction has no bearing upon a student's selection to the medical college.

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</table>

$\chi^2 = .13$

At $df=1$, this value of $\chi^2$ is not significant thus our null hypothesis stands accepted.
Relationship between the educational status of parents and selection of students to prestigious vocations.

H₀ = The selection of students to the vocations under study is not related to the educational status (graduate-level) of their parents.

<table>
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<th>Not educated Parents</th>
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<td>294</td>
</tr>
<tr>
<td>Fe</td>
<td>147</td>
<td>147</td>
<td>294</td>
</tr>
<tr>
<td>Fo - Fe</td>
<td>117</td>
<td>- 117</td>
<td></td>
</tr>
<tr>
<td></td>
<td>2</td>
<td>13689</td>
<td>13689</td>
</tr>
<tr>
<td>(Fo-Fe)^2</td>
<td>93.12</td>
<td>93.12</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{\sum (O - E)^2}{E}
\]

\[
\chi^2 = 93.12 + 93.12
\]

\[
\chi^2 = 186.24
\]

df = 1

This value of \( \chi^2 \) is highly significant, thus rejecting our hypothesis of independence of coaching and parents' education.
Ho = The selection of students to the vocations under study is not dependent upon whether the students are taught at home by their parents or somebody else (including self-study).

<table>
<thead>
<tr>
<th></th>
<th>Taught by Parents</th>
<th>taught by other</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fo</td>
<td>149</td>
<td>145</td>
<td>294</td>
</tr>
<tr>
<td>Fe</td>
<td>147</td>
<td>147</td>
<td>294</td>
</tr>
<tr>
<td>Fo - Fe</td>
<td>2</td>
<td>-2</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>4</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$ (Fo-Fe)</td>
<td>0.027</td>
<td>0.027</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{(\text{Fo-Fe})^2}{\text{Fe}}
\]

\[
\chi^2 = 0.027 + 0.027
\]

\[
\chi^2 = 0.054
\]

df = 1

This value of $\chi^2$ is highly insignificant, thus accepting our null hypothesis.
$H_0 =$ There is no relationship between a student's selection to the three vocations under study and whether the student is taught at home by some one or does self study.

<table>
<thead>
<tr>
<th></th>
<th>Students by some one</th>
<th>Student not taught by any one</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$F_0$</td>
<td>251</td>
<td>43</td>
<td>294</td>
</tr>
<tr>
<td>$F_e$</td>
<td>147</td>
<td>147</td>
<td>294</td>
</tr>
<tr>
<td>$F_0 - F_e$</td>
<td>104</td>
<td>- 104</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>$\frac{(F_0 - F_e)^2}{F_e}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>10816</td>
<td>10816</td>
<td></td>
</tr>
<tr>
<td>$\chi^2$</td>
<td>$\frac{(F_0 - F_e)^2}{F_e}$</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>73.58</td>
<td>73.58</td>
<td></td>
</tr>
</tbody>
</table>

$\chi^2 = \frac{(F_0 - F_e)^2}{F_e}$

$= 73.58 + 73.58$

$= 147.16$

$df = 1$

This value of $\chi^2$ is highly significant, thus rejecting our null hypothesis.
Ho = Selection of students to the three vocations under study, has no relationship with any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Student with Coaching</th>
<th>Students without Coaching</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fo</td>
<td>134</td>
<td>157</td>
<td>291</td>
</tr>
<tr>
<td>Fe</td>
<td>145.5</td>
<td>145.5</td>
<td>291</td>
</tr>
<tr>
<td>Fo - Fe</td>
<td>-11.5</td>
<td>11.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(Fo-Fe)</td>
<td>132.3</td>
<td>132.3</td>
</tr>
<tr>
<td>(Fo-Fe)</td>
<td>.91</td>
<td>.91</td>
<td></td>
</tr>
<tr>
<td>Fe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ \chi^2 = \sum \frac{(Fo - Fe)^2}{Fe} \]

\[ \chi^2 = 1.82 \]

\[ df = 1 \]

This value of \( \chi^2 \) is not significant hence our null hypothesis is accepted.
Ho: Selection of students to I.M.A. has no relationship with any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Student with Coaching</th>
<th>Students without Coaching</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>fo</td>
<td>25</td>
<td>117</td>
<td>142</td>
</tr>
<tr>
<td>fe</td>
<td>71</td>
<td>71</td>
<td>142</td>
</tr>
<tr>
<td>fo - fe</td>
<td>-46</td>
<td>46</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(fo-fe)</td>
<td>2116</td>
<td>2116</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(fo-fe)</td>
<td>29.8</td>
<td>29.8</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>fe</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{(fo - fe)^2}{fe}
\]

\(df = 1\)

\[
= 29.8 + 29.8 = 59.6
\]

This value of \(\chi^2\) is very highly significant hence our hypothesis of null stands rejected.
Ho = Selection of students to Engineering University, Roorkee has no relationships with any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Student with Coaching</th>
<th>Students without Coaching</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>$f_o$</td>
<td>54</td>
<td>26</td>
<td>80</td>
</tr>
<tr>
<td>$f_e$</td>
<td>40</td>
<td>40</td>
<td>80</td>
</tr>
<tr>
<td>$f_o - f_e$</td>
<td>14</td>
<td>- 14</td>
<td></td>
</tr>
<tr>
<td>$\frac{2}{(f_o - f_e)}$</td>
<td>196</td>
<td>196</td>
<td></td>
</tr>
<tr>
<td>$\frac{2}{f_e}$</td>
<td>4.9</td>
<td>4.9</td>
<td></td>
</tr>
<tr>
<td>$f_e$</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{(f_o - f_e)^2}{f_e}
\]

\[
\chi^2 = \frac{4.9 + 4.9}{4.9 + 4.9} = 9.8
\]

This value of $\chi^2$ is significant so our null hypothesis is rejected.
No. = Selection of students to Medical College. Jhansi has no relationship with any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Student with Coaching</th>
<th>Students without Coaching</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fo</td>
<td>55</td>
<td>14</td>
<td>69</td>
</tr>
<tr>
<td>Fe</td>
<td>34.5</td>
<td>34.5</td>
<td>69</td>
</tr>
<tr>
<td>Fo-Fe</td>
<td>20.5</td>
<td>-20.5</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(Fo-Fe)^2</td>
<td>420.3</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>(Fo-Fe)^2</td>
<td>12.2</td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{(\text{Fo} - \text{Fe})^2}{\text{Fe}}
\]

\[
df = 1
\]

\[
= 12.2 + 12.2
\]

\[
= 24.4
\]

This value of \( \chi^2 \) is highly significant, thus rejecting our null hypothesis.
Relationship between the educational status of parents and coaching undertaken by students.

Ho = There is no relationship between the educational status (Graduate Level) of parents and coaching taken by students for selection.

<table>
<thead>
<tr>
<th></th>
<th>without coaching</th>
<th>with coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parents educated (at least one)</td>
<td>143 B</td>
<td>118 A</td>
</tr>
<tr>
<td>Parents not educated (i.e. none of them a graduate)</td>
<td>14 D</td>
<td>16 C</td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{(A-D)^2}{(A+B)(C+D)(B+D)(A+C)} = \frac{1652-2298}{261 \times 30 \times 157 \times 134} = -0.049
\]

\[
\chi^2 = N \times \frac{291}{16.2 \times 5.5 \times 12.5 \times 11.6} = 0.7 \quad \text{df} = 1
\]

\[
N = 291
\]

\[
\chi^2 = 0.0024
\]

This value of \( \chi^2 \) is not significant, thus accepting the null hypothesis.
Ho = There is no relationship between students' selection to I.M.A. and their parents' educational status.

| Parents educated (at least one) | Students with Coaching | 107 | B | 22 A |
| Parent not educated | Students with Coaching | 10 | D | 03 C |

\[
\chi^2 = \frac{220 - 321}{\sqrt{129 \times 13 \times 117 \times 25}} = -0.046
\]

\[
\chi^2 = N \times \chi^2
\]

\[
= 142 \times 0.021
\]

\[
= 0.3
\]

This value of \( \chi^2 \) is not significant so our null hypothesis is accepted.
Table 9 B

Ho = There is no relationship between selection of students to Engineering and Medical College and the educational status of their parents.

<table>
<thead>
<tr>
<th>Parents educated (at least one)</th>
<th>Students without Coaching</th>
<th>Student with Coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>36</td>
<td>96</td>
</tr>
<tr>
<td>Parents not educated</td>
<td>04</td>
<td>13</td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{384 - 468}{\sqrt{132 \times 17 \times 40 \times 109}} = \frac{-84}{3127.9} = -0.027
\]

\[
\chi^2 = N \cdot \frac{2}{N} = 149 \times 0.0007 = .104
\]

\[\text{df} = 1\]

\[N = 149\]

\[\chi^2 = .0007\]

This value of \(\chi^2\) is not significant so our null hypothesis is accepted.
Ho = These in no relationship between the type of schooling a student has had and any coaching taken by him.

<table>
<thead>
<tr>
<th></th>
<th>Type A school (Central + English Medium)</th>
<th>Type B School (Govt. College+Pvt. aided School)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students with coaching</td>
<td>60</td>
<td>B 73</td>
</tr>
<tr>
<td>Students without Coaching</td>
<td>102</td>
<td>D 55</td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{AD - BC}{\sqrt{(A+B)(C+D)(B+D)(A+C)}} = \frac{4146}{11.5 \times 12.5 \times 12.7 \times 11.3} = 0.201
\]

\[
\chi^2 = N \hat{\gamma}^2
\]

\[
= 290 \times 0.04
\]

\[
= 11.6
\]

This value of $\chi^2$ is significant so our null hypothesis stated above is accepted.
Ho = For IMA trainees, there is no relationship between the type of schools they have had and any coaching taken by them.

\[
\chi^2 = \frac{720 - 459}{\sqrt{25 \times 117 \times 107 \times 35}} = \frac{261}{3309.7} = .08
\]

\[\text{df} = 1\]
\[N = 142\]
\[\chi^2 = .006\]

\[
\chi^2 = N \times \frac{\chi^2}{N} = 142 \times .006 = .85
\]

This value of \(\chi^2\) is not significant so our null hypothesis stands accepted.
Ho = For Engineering students, there is no relationship between the type of schooling they have had and any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Type A schools</th>
<th>Type B School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students with coaching</td>
<td>21 B</td>
<td>33 A</td>
</tr>
<tr>
<td>Students without Coaching</td>
<td>07 D</td>
<td>19 C</td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{231 - 399}{\sqrt{54 \times 26 \times 28 \times 52}} = \frac{-168}{1427.78}
\]

\[
= -.1175
\]

\[
df = 1
\]

\[
N = 80
\]

\[
\chi^2 = .014
\]

\[
\chi^2 = N \cdot \chi^2 = 80 \times .014 = 1.12
\]

This value of \( \chi^2 \) is not significant so our null hypothesis is accepted.
Ho = For medical college students there is no relationship between
the type of schooling they have had and any coaching taken by them.

<table>
<thead>
<tr>
<th></th>
<th>Type A schools</th>
<th>Type B School</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students with coaching</td>
<td>23 B</td>
<td>32 A</td>
</tr>
<tr>
<td>Students without Coaching</td>
<td>06 D</td>
<td>08 C</td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{192 - 184}{\sqrt{55 \times 14 \times 29 \times 40}} = \frac{8}{945.1} = .0085
\]

df = 1

\[
N = 69
\]

\[
\chi^2 = .00007
\]

\[
\chi^2 = N \chi^2 = 69 \times .00007 = .005
\]

This value of \( \chi^2 \) is highly insignificant so we accept our null hypothesis stated above.
Ho = The Coaching taken by a student has no relationship with whether he is a high achiever or not.

<table>
<thead>
<tr>
<th></th>
<th>Students with Coaching</th>
<th>Student without Coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>high achievers</td>
<td>73</td>
<td>63</td>
</tr>
<tr>
<td>(above 70% marks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>not high achievers</td>
<td>59</td>
<td>92</td>
</tr>
<tr>
<td>(below 70% marks)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\chi^2 = \frac{3717 - 6716}{\sqrt{136 \times 151 \times 132 \times 155}} = \frac{-2999}{20499.34} = -0.15
\]

\[
\chi^2 = N \chi^2 = 287 \times 0.02 = 5.74
\]

N = 287

df = 1

\[
\chi^2 = 0.02
\]

This value of \( \chi^2 \) is significant at .05 and .02 levels but not at .01 level. The null hypothesis is rejected.
Ho = For I.M.A. students, any coaching taken by them has no relationship with whether they are high achievers or not.

<table>
<thead>
<tr>
<th></th>
<th>Students with Coaching</th>
<th>Student with out Coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>High achievers (above 70% marks)</td>
<td>12 B</td>
<td>45 A</td>
</tr>
<tr>
<td>not high achievers (below 70% marks)</td>
<td>11 D</td>
<td>72 C</td>
</tr>
</tbody>
</table>

$$\chi^2 = \frac{495 - 864}{\sqrt{57 \times 83 \times 23 \times 117}} = \frac{-369}{3568.67} = -.103$$

$$\chi^2 = N \cdot \chi^2 = 140 \cdot .011 = 1.54 \quad df = 1$$

$$N = 140$$

$$\chi^2 = .011$$

This value of $$\chi^2$$ is not significant so we accept the hypothesis stated above.
Ho = For Engineering and Medical Students, any coaching taken by them has no relationship with whether they are high achievers or not.

<table>
<thead>
<tr>
<th></th>
<th>Students with Coaching</th>
<th>Student without Coaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>High achievers</td>
<td>61 B</td>
<td>18 A</td>
</tr>
<tr>
<td>(above 70% marks)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Not high achievers</td>
<td>48 D</td>
<td>20 C</td>
</tr>
<tr>
<td>(below 70% marks)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[
\varphi^2 = \frac{864 - 1220}{\sqrt{79 \times 68 \times 109 \times 38}} = \frac{-356}{4717.1} = -0.075
\]

\[
\chi^2 = N \varphi^2 = 147 \times 0.0056 = 0.82 \quad \text{df} = 1
\]

\[
N = 147
\]

\[
\varphi^2 = 0.0056
\]

This value of \( \chi^2 \) is not significant so our null hypothesis is accepted.
Eng/ Hindi Medium

<table>
<thead>
<tr>
<th></th>
<th>English medium</th>
<th>Other language</th>
<th>Hindi medium</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total</td>
<td>77%</td>
<td>1.6%</td>
<td>21.4%</td>
</tr>
<tr>
<td>IMA (Hindi + Other medium)</td>
<td>4.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Engineering</td>
<td>67.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical</td>
<td>52.2%</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
[2] Type of Schools

Total

Govt.
Colleges
22.1 %

Central
Schools
28.6 %

Private
Aided Schools
21.4 %

Public
English Medium
Schools
27.9 %

Vocation-Wise

IMA
ENGG. Univ.
MEDICAL

9 %
30.9 %
39.1 %

45.8 %
13.6 %
10.1 %

15.3 %
34.6 %
18.7 %

29.9 %
21 %
31.9 %
[3] Schooling of general category students

Medical college students

General Cat. 49

Total 69

Engineering University Students

General Cat. 59

Total 78

A - Govt. Colleges
B - Central Schools
C - Pvt. Aided Schools
D - English Medium / Public Schools
[4] Students belonging to different income groups

Total 279

HIG 16/279

LIG 45/279

MIG 218/279
151 students from different schools, belonging to different income levels.
(g) Relationship between parents' education and extra coaching taken by students.
Reason for joining the chosen vocation:

- Reason no. 1: Choose this vocation because his/her father or mother is in it (25% of 288).
- Reason no. 2: Choose this vocation just because the opportunity presented itself (31.6% of 288).
- Reason no. 3: Choose this vocation due to some reason other than 1 and 2 (43.4% of 288).