INCLUSION OF NON ACADEMIC VARIABLES IN TEACHING LEARNING SYSTEM

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CERTIFICATE

This is to certify that the research work entitled "**Inclusion of Non Academic Variables in Teaching Learning System**" by Sri Arun Kumar Singha for the fulfillment of the requirements of the award of Ph. D. Degree in Education under the Department of Education, University of Kalyani is based on the results of research work accomplished by him. No part of this theses has been submitted for any other degree. He has completed the research work under my guidance.

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CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER – I

INTRODUCTION

CHAPTER – I

INTRODUCTION

1.1 Introduction

Nonacademic factors also do matter, especially as they somewhat related to different activities which can lead academic development. Nonacademic factors can influence academic performance, but cannot substitute for it. Relevant nonacademic factors can be classified into three groups.

1. Individual psychosocial factors. such as Interest, motivation and self-regulation (e.g., emotional control, academic self-confidence) etc.
2. Family factors, such as attitude toward education, involvement in students' school activities, and family related matters.
3. Vocational Planning that identifies a good fit between students' interests and their academic work.

Nonacademic factors comprise all individual psychosocial factors that have a positive correlation which include academic discipline, academic self-confidence, social connection, general determination, communication skills, social activity, goal striving, study skills, commitment to college, and emotional control. Family and career development factors are not included in the model. For a detailed description of the nonacademic factors tested in the models, Robbins et al. (2004).

Educators, students and their families, and society at large can make effective use of nonacademic student information to support student academic performance. Educators should :

- Monitor relevant nonacademic student behaviors, based on such indicators as absenteeism and missed homework assignments, and use this information to identify students who may be in academic trouble
- Intervene to encourage students to re-engage with their academic work
- Promote postsecondary goals through rigorous coursework and effective

career planning

- Students and their families should :
- Seek help to focus on academic work and improve academically supportive behaviors
- Seek information and support on activities that prepare students for postsecondary education, including financing, career decision-making, and relevant work and school experiences

Society at large should :

- Place the highest priority on academic achievement and signal clearly to students and families that academic achievement is essential to the economic well-being of every individual, each state, and the country as a whole

Success means fulfilling academic requirements. There are no shortcuts to academic success. We should all be focused on helping our students become academically prepared, primarily through direct academic interventions, and secondarily through cultivation of the nonacademic factors that support academic achievement.

Related to school-based non-academic activities according to Michael Karcher, Associate Professor, University to Texas at San Antonio described herewith :

One unknown in the practice of school-based mentoring is what mentors should do with their mentees when they meet. There is general agreement that in community-based mentoring psychosocial and developmental activities seem to best support the development of strong mentor-mentee relationships. There also is compelling evidence that in school to work programs, workplace mentoring, and apprenticeships a more goal-directed, instrumental approach is essential to establishing a satisfying and productive match. School-based mentoring falls somewhere in between these two. School-based mentoring does

take place in schools, where there is increasing pressure to help students, especially those who are underperforming or who are in underperforming schools, develop academic skills, habits, and interests. But to date there has been little research looking at the association between these two contrasting types of activities — developmental or psychosocial activities vs. instrumental, goal-focused activities — and important outcomes from school based mentoring, including both psychosocial outcomes (connectedness, self-esteem, social skills) and instrumental outcomes (grades, attendance).

In the Secondary Education Commission's opinion, the most outstanding and educationally relevant facts which are not only academic but some other factors which are nonacademic are also look potential in the Indian situation were :

1. The adoption of the goals of democracy and socialism necessitating the development among the people of a broad, national and secular outlook;
2. The extreme poverty of the country and urgency for promoting its economic growth; and
3. The absence of educational facilities needed for developing all aspects of the human personality and the neglect of cultural pursuits and activities.

On the basis of this analysis, the Commission recommended that secondary education should be reoriented to the combination of academic and nonacademic aims and objectives :

a) *Development of qualities essential for creative citizenship :* This includes the development in the students of secondary schools of those habits, attitudes and qualities of character which are essential for creative citizenship in a democratic society. Among these qualities, which are to be fostered through curricular and co-curricular activities in secondary schools, are :

i) The capacity for clear thinking;

ii) The scientific attitude of mind;

iii) A receptivity to new ideas;

iv) A respect for the dignity and worth of every individual;

v) The ability to live harmoniously with one's fellowmen through the cultivation of discipline, cooperation, social sensitiveness tolerance and

vi) A sense of true patriotism.

b) *The promotion of vocational efficiency :* This involves not only the creation of a new attitude to work and an appreciation of the dignity of manual labour but also the development of the students' technical skill and efficiency through greater emphasis on craft and productive work and the diversification of courses at the secondary stage.

c) *Development of personality :* This implies cultivation of the students' literary, artistic and cultural interests for a fuller development of their personalities. This means the provision of subjects like art, craft, music, dancing and hobbies in the secondary school curricula.

d) *The training for leadership :* The training of persons who, on completion of the Secondary stage, would be able to assume the responsibilities of leadership at the intermediate level.

Inculcation of values, attitudes and work habits : The methods of teaching in schools should aim not merely at the imparting of knowledge in an efficient manner, but also at inculcating desirable values and proper attitudes and habits of work in the students.

They should, in particular, endeavour to create in the students a genuine attachment to work and a desire to do it as efficiently, honestly and thoroughly as possible.

Activity and project methods : The emphasis in teaching should shift from verbalism and memorization to learning through purposeful, concrete and

realistic situations and, for this purpose, the principles of Activity Method and Project Method should be assimilated in school practice.

Teaching methods should provide opportunities for students to learn actively and to apply practically the knowledge that they have acquired in the classroom. Expression Work of different kinds must, therefore, form part of the programme in every school subject.

Emphasis on clear thinking and expression : In the teaching of all subjects special stress should be placed on clear thinking and clear expression both in speech and writing.

Training pupils in techniques of study : Teaching methods should aim less at imparting the maximum quantum of Knowledge possible, and more on training students in the techniques of study and methods of acquiring knowledge through personal effort and initiative.

Instruction to suit different student abilities : Attempt should be made to adopt methods of instruction to the needs of individual students as much as possible so that dull, average and bright students may all have a chance to progress at their own pace.

Group projects and activities : Students should be given an adequate opportunity to work in groups and to carry out group projects and activities so as to develop in them the qualities necessary for group life and cooperative work.

1.2 System : Meaning and Concept

- A system has many components or parts each of these have a different function to perform but all of these together contribute to the functions of the system.

- The components of a system are interrelated and interdependent.
- Thus a system may be defined as an entity which consists of interrelated and interdependent components, and works towards the attainment of certain functions.

Ref. : Indira Gandhi National Open University Study Material (B. Ed) –2005

System Meaning and Concept

"As deliberately designed synthetic Organisms Comprised of interrelated and interacting components which are employed to function in an integrated fashion to attain predetermined purposes".

Ref : Innovations in Teaching-Learning Process by S. S. Chauhan, pp. 47, 2001

Longman's Dictionary of Contemporary English Edited by Paul Proeter defines "System as a group of related parts working together : an ordered set of ideas, methods".

According to Oxford dictionary compiled by Betty Kirk Patrick, 2002, "System refers to structure, organization, order and arrangement of a particular dimension".

The advanced learner's Dictionary of current English defines that "Group of things or parts working together in a regular relation".

Banghart (1969) defines system as "an integrated assembly of interacting elements, designed to carry out co-operatively a predetermined function".

R. L. Ackoof (1971) defines "A system is the set often interrelated and interdependent elements".

Crawford Robb (1973) : "System is a systematic organisation of the elements that operates in a unique way".

Robert Davis defines as "A learning system is an original combination of people, materials, facilities, equipment and procedures which interact to achieve the goal".

Hickey (1960) defines "A system is an assemblage of objects united by

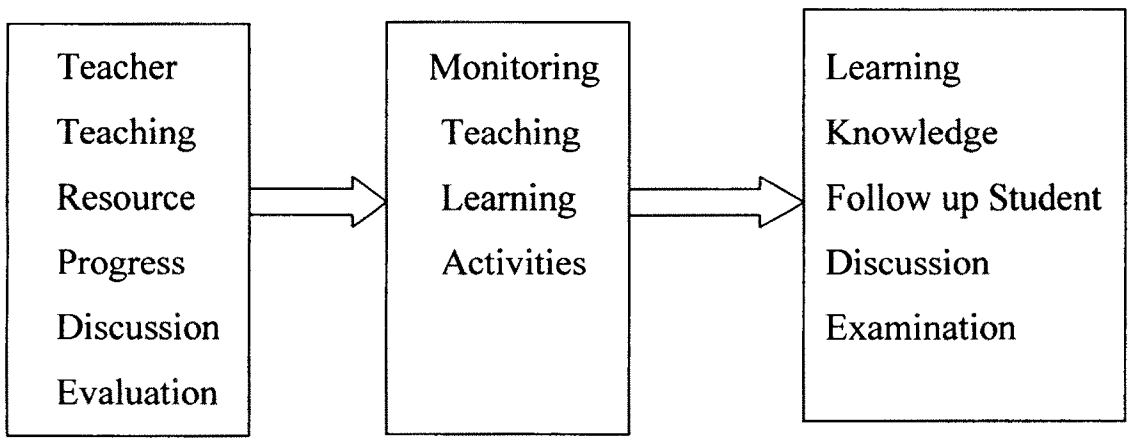
some form of regular interaction or interdependence, which collectively Contribute towards an important and complex function".

Johnson, Kast, Rosenzweigh (1964) define a system as "an organised or complex whole, an assemblage or combination of things or parts for many a complex or unitary whole".

A. K. Jalaluddin (1981) : "A system may be defined as a dynamic, complex, integrated whole consisting of self-regulating pattern of interrelated and interdependent elements organised to achieve the pre-determined and specified objectives."

Ref : J. C. Agarwall

Model at the Interactive Teaching-Learning System by Young-Sheng-Chen (2004) :



From background study it reveals the following aspects :

- Real situation of Teaching & Learning in West Bengal.
- Analysis of examination system to understand the true picture of evaluation techniques followed in West Bengal Secondary Schools.
- Mechanism of Teaching Learning system on the basis of realistic mode.

Any teaching learning system should be based on situational factors, availability of resource persons, infrastructural facilities, curriculum structure,

teaching learning process and examination pattern are different sub systems of Teaching-Learning System.

1.3 Teaching Learning System (2002) by Roy Lee Foley

The process of system dynamics for a teaching-learning system consists of five stages.

- **The first stage :** It is the description or mapping of the system. It is the most important and the least straightforward of the stages in our analysis. It requires taking various bits of information about teaching-learning systems in the real world and turning them into a unified theory.
- **Second stage :** The formulation and construction of a simulation model is performed. The system description is translated and converted into the level and rate equations of a system dynamics model by providing the requisite parameters. Creating the simulation model requires that the rather general and incomplete description of the first stage be made explicit.
- **Third stage :** Simulation of the model, will start after the equations of the previous stage pass the logical criteria of an operable model, such as all variables being defined, and consistent units of measures. The first simulations at this stage will raise questions that cause repeated returns to the both prior stage until the model becomes adequate for the purpose under consideration.
- **Fourth stage :** Some policy alternatives are chosen for testing.
- **Fifth stage :** Proposed policy changes will be tried to the model to maintain or obtain sustainable improvement in performance while considering the feasibility of implementing these changes in its real world. If the model is relevant and persuasive, then the process can be concluded for the necessary evaluations.

1.4 The Parameters of Teaching Learning System

Many parameters and situations are considered in this study. Below are some examples.

1. **Types of Learning :** Different types of learning are generally accepted and required in any educational process. They include : rote learning (memorizing), closed problem solving (understanding and comprehending), open problem solving (creative thinking), and skill development. Other types and sub-types have also been defined.

2. **Teaching System :** Different types of teaching systems are generally considered. They include : traditional teaching (Professors, instructors, graduate students as TA's and RA's and lecturers, lectures, textbook, lecture notes, overhead and slide projectors lab, etc.), computer driven overhead, interactive software, testing and marking software, interactive distance video, all students with computers, and improvements to internet to remove paper requirements.

3. **Subject Matter :** Different types of subject matter can be generally considered. But learning materials extracted from an introductory course in Industrial Engineering taught to the second year Engineering students at University of Manitoba is chosen for the purpose of the study. The subject learning materials require a quantity of mathematics, physics, chemistry, analytic, geometric, memory, dexterous and other abilities.

4. **Student Type :** A student description requires at least three groups of parameters. They are : 'ability to learn' relative to subject type and learning type, 'poor knowledge' about the subject (and also general background knowledge), and 'desire to learn'. The ability to learn is not considered essentially fixed because certain learning skills may still be learned. The prior knowledge (and or background knowledge) of the student can typically

be adjusted by remedial programs if they have the basic ability to learn in the subject. Some types of desire (motivation) e.g. basic interest in subject, tend to be intrinsic while other types, e.g. seeing a relation between the subject and a future profession, can be adjusted to some extent by the structure and style of the teaching process.

Ref: A study on Teaching Learning System of Physical Science at the Secondary Level Schools ion West Bengal by Nirmal Kr. Mitra.

1.5 Varieties of Performance

Specific responding is making a specific response to a particular stimulus. An example occurs when a first-grade teacher holds up a card (the stimulus on which the word dog is printed and the children say "dog" (the response). Specific responding is an extremely important type of learning and is the basis for much of the information we possess. In order for the student to learn to make correct, specific responses, we must assume he or she has the ability to make connections between things. In the previous example, the printed word dog is associated, or connected, with the verbal statement "dog".

Chaining is making a series of responses that are linked together. Gagne uses the examples of unlocking a door with a key ad of translating from one language to another. Unlocking a door requires us to us to use a number of specific responses (selecting a key, inserting it, turning it) in an order that will get the job done. When one takes the English words "How are you ?" and translates them to "Como esta usted ? In Spanish, one is chaining by taking a series of specific responses and linking them into a phrase.

Multiple discrimination is involved in learning a variety of specific responses and chains and in learning how to sort them out appropriately. For example, one learns to associate colors with their names under very similar conditions, but then has to sort out the colors and apply them to varieties of object under different conditions, choosing the right responses and chains.

Similarly, when learning a language, one develops a storehouse of words and phrases. Spoken to one, one has to sort out the reply, adjusting for gender, number, tense and to forth. Multiple discrimination, then, involves learning to handle previously learned chains of various sorts.

Classifying is assigning objects to classes denoting like functions. Learning to distinguish plants from animals or automobiles from bicycles involves classifying. The result of this process is concepts, ideas that compare and contrast things and events or describe causal relations among them.

Rule using is the ability to act on a concept that implies action. For instance, in spelling we learn varieties of concepts that describe how words are spelled. Then we apply those concepts in rule form in the act of spelling itself. As an example, one learns that in consonant-vowel words ending in "t", such as sit, the consonant is doubled when 'ing' is added. This becomes a rule (double the 't') that one usually follows in spelling such words.

Finally, problem solving is the application of several rules to a problem not encountered before by the learner. Problem solving involves selecting the correct rules and applying them in combination. For example, a child learns several rules about balancing on a seesaw and then applies them when moving a heavy object with a lever.

1.6 Different Non Academic Activities

The first notion is that teaching is the creation of environments in which students' cognitive structures can emerge and change. The goal is to provide learning experiences that give the student practice with particular operations: Piaget believes that cognitive structures will grow only when students initiate their own learning experiences; learning must be spontaneous. The assumption is that students will initiate learning experiences that optimally match their cognitive structures. Provided the opportunity exists in the environment, because students intuitively know what activities they need. Piaget believes that

if we teach too far above the students, learning is not possible. Each person must construct his or her own knowledge. Which can not be absorbed readymade from adults. He feels that we may alter students' verbal responses and behaviours as a result of direct teaching and reinforcement, but he does not consider verbal fluency to be "real knowledge" that can occur only as a result of development – that is, when the task is useful to the student, and when he or she is psychologically ready.

The student's role in the learning experience must be active and self-discovering, and the experiences themselves must be inductive. In learning new operations children must be given extensive opportunity to manipulate the environment. For young children the materials we use should be concrete instead of symbolic representation (for example, blocks or bottle caps instead of numbers). The environment should be rich in sensory experiences. Piager sees important symbolic meaning in ;the manipulation, play, and aesthetic behavior of children, activities that have much to tell us about children's intellectual development. The teacher's function is to arrange for learning experiences that facilitate state-relevant thinking and to organize instruction so that students can initiate the activity and discover through :

1. Interaction.
2. Communication.
3. Creative activity.

The second principle is based on Piaget's distinction among three type of knowledge; physical, social and logical. The demands of the learning situation are different for the three types of knowledge. Physical knowledge refers to learning about the nature of matter (for example, cotton is soft, metal is hard and often unbendable, balls drop to the ground when you release them). Social Knowledge is obtained through feedback from other people. It provides a framework for determining the effects of social actions and social connections (for instance, most people say hello when they first see each other, and celebrate

their birthdays each year). Social knowledge must come through free interaction with other people in the environment. We need to hear other people's view, have different role models available and make choices for ourselves. Logical knowledge is concerned with mathematics and logic. It is constructed by processes of reflection and abstraction. The teacher's role in physical and logical knowledge is concerned with mathematics and logic. It is constructed by process of reflection and abstraction. The teacher's role in physical and logical knowledge is to provide as setting in which students construct this knowledge for themselves through questioning and experimenting. Teachers should refrain from giving answers directly but may use prompting questions that encourage further thought and exploration.

Knowledge is best learned from other children they provide a source motivation and information in a linguistic form that matches each other's cognitive structures. The peer group is also a reliable source of disequilibrium. Given these principles, Wadsworth (1978) outlines three roles for teachers who operate from a Piagetian orientation: (1) organizer of the learning environment (2) assessor of children's thinking; an (3) initiator of group activities, especially play, games, and discussions.

During the past 10 years, three Piaget-derived educational models have become prominent, particularly among early childhood educators. Each places a different amount of emphasis on each of the three roles identified by Wadsworth. Each model emphasizes ways of adjusting instruction to be cognitive development of the students.

The first model was developed by Celia Lavatelle and is referred to as a packaged Piager based curriculum for children 4 to 7 years old (Lavatelle, 1970). It consists of 100 activities occurring over a 30-week period. Lavatelle recommends that the activities be completed in 10 to 15 minutes periods with small groups of five to six children. She also outlines other activities, especially with self-directed play. The objective of Lavatelle's curriculum is to develop

children's intellectual processes through self-directed activity. The topics include classification; number, measurement, and space operations; and seriation operations. A typical early activity might have the children identify all squares that are blue (object matching on basis of two more properties).

While Lavatelle accents the curriculum, in his programme Project follow-through. The Cognitively Oriented Curriculum. David Weikart (1971) includes the entire learning environment. The curriculum is similar to Lavatelle's, with the core areas being classification (grouping), seriation (ordering), spatial relations and temporal relations. Weikert's activities stress experiencing concepts first one a motoric (physical manipulation) level and then gradually adding the verbal level-first the sign (objects from pictures and then the symbol words alone). Each goal is implemented along all three levels.

The third educational model is that of Kamii and Devries (1974). Their current model represents a shift away from specific objectives and a sequenced curriculum. The new program is based on Piaget's ideas about nature of knowledge and teacher's special role in relationship to each of knowledge :

Non- Academic Variables :

1. Social factors
2. Physical or Natural factors

1.7 Learning Styles and Non-academic Variables

Learning styles are important because they are the education relevant expressions of the uniqueness of the individual. Individual differences are to be prized because they are the expression of the uniqueness of personalities Individually, our configurations give us our personal identities together, they also exemplify the richness of our culture.

We hope to provide our children with a common education that enhances their individuality and encourages their personalities and simultaneously passes

along our culture and its tools. As teachers we need to use our teaching repertoires in such a way that we capitalize on the characteristics of our students to help them achieve increasing control over their own growth.

With respect to models of teaching, we can begin by avoiding two mistakes. The first is to assume that a model of teaching is a fixed, inflexible formula for teaching, which should be employed rigidly for best result. The second is to assume that each learner has a fixed style of learning that is unlikely to change or grow. But mistakes lead us into an impossible dilemma, for if unyielding teaching methods are mismatched with rigid learners, a destructive collision is inevitable. Fortunately, teaching methods have great flexibility, and students have great learning capacities and hence, adaptability.

Consider the nature of the models of teaching, we have been discussing. By its very nature, the personal family begins with the uniqueness of the learner, and each personal model tries to help the students take charge of their own growth. The social models depend on the synergy caused by that interaction of heterogeneous minds and personalities. The group investigation model explicitly generates the energy for learning from different perceptions of academic and social problems. The behavioural models build into instructional sequences the ability to adjust pace and complexity of tasks to the ability and prior achievement of the student. The information processing models provide ways of adjusting instruction to cognitive development and style.

Then perhaps most important to this discussion – we not only employ a model to reach information, concepts, skill, the analysis of values, and other content objectives, but we also teach the students to use the strategies of each model to educate themselves. In the previous chapters we have cast each model as a way of teaching students to learn particular ways of thinking. From that perspective, each model of teaching can be seen as a model of learning – a way of helping, students expand their styles of approaching problems now and in their futures.

Learning Style : Felder's Concept (1993)

Different Types of Information Processing :

I. Sensory and intuitive learners

Sensory – Observation through sensory organs.

Intuitive – Insight, memorization, imagination.

II. Visual and Verbal Learners

Visual – Visual Presentation (pictures, diagrams, flow charts, practicals, differ visual teaching aides).

Verbal – Demonstration through lectures and reflective.

III. Active – Process – Information

Active – Interaction and Discussion

Reflective – Experimentation.

IV. Sequential and Global Learners

Sequential – Holistic Approach

Global – Global approach and conception to totality.

V. Inductive and Deductive Learners

Inductive – Information being processed from particular to general.

Deductive – General to particular information is to be considered.

Non-Academic Variables :

1. Interactive activity
2. Communicative activity

Learning Style Rosenberg's Concept (1968) :

Four general learning styles are given –

I. Rigid-Inhibited Style :

Learner's of this style usually rigid for responding and interacting in a particular situation.

II. Undisciplined style :

Students of this category are not accepted well by teachers and others because of their undisciplined attitude.

III. Acceptance–Anxious style :

This two style seems to be opposite apparently but actually correlated will because accepting nature of them is the cause of their anxiously style.

Creative Style :

Creative styles are self-confident. They are well judged by themselves.

Non-Academic variables :

1. Interactive activity.
2. Creative activity.

Kolb's Theory of Learning Style :

Four categories of Kolb's Learning Style

I. Concrete experience

Practical oriented experience.

II. Reflective observation

Development of own experience

III. Abstract conceptualization

Related to creative concept.

IV. Active Experimentation

Problem solving ability

Different strategies of learning always trying to seek their outcome from academic atmosphere only. But actually bearing as an experience passage form

concrete to abstract conceptualization, non-academic variables could also play an important role for achieving proper educational feedback.

Learning Style – Gardner's Multiple Intelligence :

Multiple Intelligence involved different categories of intelligence

i) Linguistic Intelligence

ii) Logical-Mathematical Intelligence

iii) Spatial-Intelligence

iv) Bodily-Kinesthetic Intelligence

v) Musical Intelligence

vi) Interpersonal Intelligence

vii) Interpersonal Intelligence

viii) Naturalist Intelligence

One of the most important aspect of this theory is that here cognitive structure could be developed by non-Academic variables and specially by play way activity suggested by Winters and Wang –

a) Plays with words

b) Plays with questions

c) Plays with pictures

d) Plays with music

e) Plays with moving

f) Plays with socializing

g) Plays alone

Related Non-Academic Variables :

i) Play-way activity

ii) Creative activity

iii) Interactive activity

iv) Communicative

v) Recreational activity

vi) Social awareness

Form our above discussion it could be concluded that Non-academic variables are also could play an important role for teaching-learning system. Specifically we identified six non academic variables. These are –

1. Play-way activity
2. Recreational activity
3. Creative activity
4. Communicative activity
5. Interactive activity
6. Social awareness activity

These Non-Academic are being extracted from different Teaching Learning Models and Theories. We are trying to evaluate different aspects of Non-Academic Activities and their impact on Academic Achievement and to explain the multiple of interest.

It is apparent from the present study that the students of class IX possess diversified academic interest in different degrees. The academic interest is essential for the growth of academic career of the students. Actually interest in academic affairs motivated students read more and devote more time in studies. Learning does not become a burden to them interest in curricular activities concern them hence they read joyfully for the pursued of future education. The more the interest, the more will be learning.

Moreover, non-academic interests also play an important role in the field of academic affairs. The leisure time activities are based on non-academic activities. If the students devote their leisure time activities to these non-academic activities they get inspiration or academic activities, hence the non-academic activities influence to a great extent the academic activities of the students. One is the counter part of the other.

1.8 Objectives of the Study

- To study the different non academic variables at Higher Secondary Schools of West Bengal.
- To construct a standardized Questionnaire regarding Non Academic Activities.
- To study Teaching Learning System and how Non Academic Variables can be incorporated with the system.
- To study the Teaching Learning Process of Higher Secondary Level Schools of West Bengal.
- To study the different interests including academic, nonacademic, vocational and other activities for inclusion of Non Academic Variables.

1.9 Statement of the Problem

"Inclusion of Non Academic Variables in Teaching Learning System".

1.10 Methodology

Type of Research: The Research is basically descriptive type Survey Research. Both descriptive and inferential statistics have been used for conducting the study.

Tools Used

1. Interest Inventory regarding Nonacademic Activities.
2. Standardized Questionnaire regarding Multiple Interest of Learners.

Population : Eleven grade students of West Bengal are considered as population.

Sample : Both the questionnaire have been applied on 700 samples from 12 selected Schools in parts of West Bengal.

1.11 Limitations

- There is no confusion about to inclusion of nonacademic variables in Teaching Learning System but it is not easy to include all the variables in a particular way. So the study is some areas of the particular field that does not demand to cover all the areas of non academic activities.

- The study is limited within the components of teaching learning system based on academic environment as well as nonacademic variables.

- The Research is comprehensive in nature. Inclusion of non academic variables are shown within some dimensions inculcated from review of studies and the situational demands.

CHAPTER – II

REVIEW OF RELATED STUDIES

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REVIEW OF RELATED STUDIES

2.1 Introduction

Teaching-Learning system is a complex procedure depends on the multi-dimensional components. It is true that Teaching and Learning is basically bipolar process. But the nature of Teaching and Learning may very in different population not in the same fashion. In West Bengal what we observe in different schools that school environment are in diversified mode. Some places are there where academic situation is satisfactory.

2.2 Review of Related Studies

Non-academic Interest – Meaning and Educational Implication :

Non-academic interest also play a significant and crucial role in setting the personality pattern of the adolescents. Though, the higher secondary students are in a stage of crisis and they are interested in a variety of directions, most of which are non-academic. As mentioned earlier, adolescent boys and girls become very much interested in selecting their dress materials. They are actively interested to adopted an appearance of so called smartness simply for the sake of attracting others. It is true that they can't be blamed for this. Interest is a personality variable, it is one's own personality that directs him / her to develop interest in objects or activity or a profession or trends which is definitely different from academic subject matter or vocation unless an adolescent continues to expand his interest in dress, clothes etc. how can one become very successful as a fashion designer if one conceives interest in non-academic field like professional-artist and is a regular performer in a local jatra or theater? Where can we look for the rising of a reputed artist in Bollywood or Tollywood ? From the standpoint establishing a youth in the worldwide struggle for peaceful and decent life, nurturing of non-academic interest among the adolescent boys and girls can't be ignored. If we consider the various means of

earning a living, it appears that non-academic interests are greater yielding of success of an individual than the academic interest. Almost the non-academic interest we may mention a few : singing, visiting places, playing games, boating, computer chatting etc.

Vocational Interest – Its Educational Implication :

Young men and young women face many personal, social, economic and vocational problems when they want to adjust themselves to their environmental situations. They have conceived some genuine interests relating to these problems. They require some advice and guidance from experienced persons in the process of adjustment so that may achieve their interests and fulfill their ambition and identification of their vocational interest in particular can go a long way to help in this matter.

It is not very easy to define the term 'Vocational'. 'Vocational' is, above all, a concept which is concerned with the desired development of the individual pupil with the clear and definite intention of bringing mental satisfaction, through one's own work and sincere effort so that the individual pupil as well as the society to which he belongs are both benefited.

Different people tried explain the term 'Vocational interest' in different ways. 'Vocational interest was regarded as an attempt to satisfy one's mental desire for certain ambition which the individual cherishes within himself from the early stage of his life and feels satisfied by earning his livelihood through such kind of activity in which he not only specialized himself as a result of training but process in born drives. It may be regarded as a process as well as a concept with the determination of the potentialities of the individual pupils and to the process of counseling and other techniques, it helps the pupils to make necessary adjustment to the environment, choose a course of study which is best suited to him and adopt a suitable vocation for leading a peaceful and fruitful living afterwards.

According to Ferreria Learners attitude depends on available facilities in school environment, infrastructure, building condition and other facilities (1995)other than academic activities. In 1970 Prushansky talking about the physical settings and attitude of learning human development causes from the academic atmospheric condition. Their feelings, attitudes, values, expectances, desires came from their school surroundings.

Mayburry explains how environment and non-cognitive factors affected the learning in 1992.

In 1988 Christopher observed that pleasant surroundings have had a better feelings or make a better attitude. School environment is a touchy matter to the learners. Their achievement and attitude both depends upon these factors. In 1972 according to Lovin, the children were very much interested about their school building and similarly shows positive response towards bright and comfortable surroundings.

In 1982 Chan founded that pupils housed in a modern school building have a positive relationships with their attitudes.

In 1976 creamer also showed the effectiveness of school facilities. Lewin in 1976 showed the influence of open-space classrooms is more effective than closed-space classrooms.

According to Bronfenbrenner (1989), young people need to have adults who are 'Crazy' about them. Unfortunately, in our most troubled schools teachers aren't crazy about students, and students aren't crazy about teachers, instead they are driving each other crazy. In these schools, support networks are weak or nonexistent for both children and teachers. Teachers may resent what they perceive as inadequate encourage, assistance, and the resources to do their job. Students may feel that nobody at school knows or cares about them.

In the domain of self concept Bowers and Burkett in 1989 shown that self concept scale of students in a modern facility were significant by higher than the student of score of those who housed in older facilities.

2.3 School Environment and Non-academic Factors

1. Effective principal leadership (Teddile & Stringfield) 1993.
2. A safe and orderly setting (Bryk & Thum) 1989.
3. Extracurricular Activities (Landers & Landers) 1978.
4. Size & impersonality of schools (Eberts & Stone) 1988.
5. Needs of the students (Gattfredson & Cottfredson) 1985.
6. School Contexts (Landers & Landers) 1978.

Some schools have a warm, friendly ambience, while others have a cold, foreboding environment that permeates classrooms and offices. It seems probable that school and classroom climate would influence student performance, and the research to classroom climate would influence student performance and the research to support this conclusion (e.g. Hill, Foster and Gendler, 1990; Fraser and Fisher 1982; Moos. 1979). To provide a warm school climate, school administration and support services in poor area must be especially sensitive to the needs of students with responsibilities or problems outside school (e.g., working students, teen mothers). Students with emotional problems may never have their difficulties treated because many schools have inadequate psychological services (Tuma, 1989).

Highly mobile students may particularly suffer from inadequate administrative and support practices. Migrant children, for example, may lose academic credits or experience delays in enrollment due to lack of communication and coordination between schools. School staff may be unaware of migrant students' needs and may fail to provide adequate guidance. Consequently, migrant children's academic progress may suffer, discouraging student persistence (Morse, 1988; Philips, 1985). Homeless children may suffer similar difficulties in school. These children face and array of problems that may interfere with learning and attendance : poor nutrition, lack of a quite place to study, inadequate clothes and school supplies, dangerous surroundings, peer

ridicule and the stress of constant moves. Schools are often not prepared to address these problems. Homeless children may have difficulties enrolling in school because they lack prerequisite records or a permanent address, and once in school they may not receive adequate encouragement and assistance (Molnar, Rath and Klein 1990; Nichols-Pierce, 1992).

Instructional practices and materials if fails to engage and challenge students, and for which classroom climate and intellectual development may suffer. Teachers may spend most of their time demanding attentiveness or trying to maintain order. The entire class, including the teacher, may watch the clock, longing to be put out of their misery. Teacher burnout and student disciplinary attendance problems are likely outcomes.

Interest is a significant determinant of how people attend to and persist in processing information (Hidi, 1990). Children are more likely to learn material that stimulates their interest. The lack of active learning experiences may help explain why students' interest in challenging subjects tends to decline. A survey of black seventh graders' science interests finds that although most students express curiosity about various science topics, and show strong interest in science discussions, filed trips, and experiments, they report that they never or seldom have input into selecting class topics or projects (Anderson, Pruitt and Courtney, 1989). Reyes and Laliberty (1992) hypothesize that the limited literacy skills of many Hispanic children may result from their assignment to classes that emphasize basic skills and passive learning rather than cultivating higher order proficiencies.

The "basic skills" approach to teaching literacy 'dooms' students to a curriculum that lacks interest and relevance (p. 264). Consequently, students have little motivation to learn. Other studies suggest that active learning in combination with "Scaffolding" (building upon the cultural knowledge that children bring to the classroom) may enhance the learning of young people of colour (Guitierrx 1992, Lee, 1992; Peterson, 1991).

Co-operative learning has been proposed as a way of enhancing academic engagement and fostering positive relations between students of diverse backgrounds (Slavin, 1990; Cohen, 1984; Skon, Johnson, and Johnson, 1981). In co-operative settings, group efforts are rewarded, thus students have an incentive to resolve differences and work together. At any rate, complete harmony among students and teachers is not a likely outcome of student engagement – indeed, one of the definitions of 'engagement' is to enter into conflict. The expression of intellectual differences between students and teachers can stimulate curiosity, improve reasoning skills, and enhance creativity (Johnson and Johnson, 1979). Conflict in the classroom can be constructive if it occurs within a structured learning environment in which problem solving, rather than personal attack, is the goal.

If schools are too accommodating to low performance, they may limit the usefulness of school attendance. Continuation schools, for examples, may be more responsive to students needs (e.g. offering daycare to young mothers) and thus often may be more attractive to students than comprehensive schools; however, they may offer limited opportunities for academic challenge (Kelly, 1989). Studying a school that has a lower dropout rate than would have been predicted by its demographics, Miller, Leinhardt, and Zigmond (1988) find that the school's warm, accommodating environment enhances engagement and thus increases the school's holding power – but it does not encourage achievement.

According to Foley 2003 Teaching Learning Process is interactive in nature. In one way interactions all the information moved to the knowledge base to the individual. One way interaction which is passive in nature would include : (a) reading (b) listening (c) watching a video taped presentation.

In two way interaction the individual is able to develop the knowledge base and in return the knowledge base will also produce some response.

Similarly interaction is also possible with the living world. Specially with teachers and trainers. In this situation the relationship between teacher &

students are very important for developing knowledge and skills.

- Teaching Learning process includes : (1) Cognitive (2) Behavioral (3) Experimental dimension.
- Teaching learning basically dual and complementary process but to model an educational system more concentration is given on learning side.
- Learning is the function of students interaction with method and subject matter.
- Learning is possible through instruction and organised experience.

An Interactive Teaching Learning system is very important in today's world when the Teaching Learning System is mainly learner centric. Here interaction is the methodology which helps learners for their better performance.

According to Yung Sheng Chen (2004) : The main components of classroom based instruction include :

(a) Instructor teaching the key contents in a textbook.

(b) Students paying attention to follow the guidance.

(c) Examinations for evaluating the learning performance of students.

Teaching and Learning framework

According to Denise Bradley (2003) – Teaching Learning framework include following steps.

- Teaching and Learning strategy
- Teaching & learning priorities.
- Future plans
- Statement on progress
- Teaching and research on Educations.

Related literature have been extracted directly on indirectly from different research findings based on teaching-learning system.

Nayak Ram Shaw showed in 1996 Interest of boys and girls towards science in schools. Major findings are : (1) Compared to the boys, the girls interest for science appeared negative in students. (2) In connection with the nature of science the inferences derived in the study reflected the impact of curriculum changes introduced in schools. (3) At the secondary stage, there was a bifurcation in two major streams of science and humanities.

Rajgapalan Malathi in 1995 observed the Formal Reasoning of Piaget in science among school students and investigate the relationship between formal reasoning and aspects like Intelligence, socio-economic status, medium of instruction, age and class. Major findings are : (1) All the four socio-economic status groups, both the medium-of-instruction groups and both the sex groups differed significantly. (2) The successive age groups or the pupils in successive grades did not show significant differences in performance. But the differences became significant when larger differences in age or grade were considered. (3) Pupils studying through English medium did show better ability in formal reasoning. (4) The medium as such did not influence the development of formal reasoning. (5) IQ and gender contributed significantly to formal reasoning. (6) Socio-economic status and gender seemed to influence formal reasoning with greater significance as compared to other aspects like age, grade and medium of instruction. (7) The formal reasoning ability of boys was higher than that of girls. (8) A higher level of socio-economic status led to higher score in formal reasoning. (9) The medium of instruction did not influence the development of formal reasoning. (10) The test of formal reasoning that had been devised (in English and Tamil) was useful in identifying the pupil's formal reasoning at five levels.

A study conducted by A. B. Saxena related to the curriculum planning and construction by identifying the misconceptions of the entire curriculum in 1994. Major Findings are : (1) In school-A out of seven units under study, four units showed significantly higher gain scores of experimental group. Two units

showed that control group gained significantly more than the experimental group. (2) In school-B only five units could be taught with the prescribed strategy. Out of the five units, only in one unit experimental group gained significantly more in comparison to control group. In one unit the gains of experimental and control groups were not significantly different. For the other units, no definite trends could be seen. (3) Continuity of using the strategy played an important role in terms of gains. (4) Concept mapping was mentioned as one of the elements of the conceived strategy. It was found that the students took time to learn drawing the concept map.

Singh Ram D, Ahluwalia, Sudarshan P and Verma Sunil K. 1994 observes the attitude of high school students towards mathematics on different intelligence levels for enhancing academic betterment. Major findings are : (1) The students of high intelligence group had more favourable attitude towards mathematics compared to the students of both average and low intelligence groups. (2) The students of average intelligence had a more favourable attitude towards mathematics than the students of low intelligence. (3) The males did not have a more favourable attitude towards mathematics than females. (4) The students of age 13+ showed more favourable attitude towards mathematics compared to the students of ages 14+ and 15+ but the students of age 14+ did not have more favourable attitude towards mathematics compared to the students of age 15+. (5) In the age range of 13+ to 15+ students of lower age showed more favourable attitude towards mathematics.

In 1995 Sumangala V. showed the relationship between different psychological components and academic achievement in mathematics. Major Findings are : (1) mathematics Aptitude and its components viz., Numerical Ability, Numerical Reasoning, Ability to use Symbols, Spatial Ability and Abstract Reasoning, Attitude towards Mathematics and Self-Concept in Mathematics discriminated significantly between high and low achievers in Mathematics. (2) The relation among the independent variables, Mathematical.

Aptitude and its component viz. Numerical Ability, Numerical Reasoning Ability to use Symbols. Spatial Ability and Abstract Reasoning. Attitude towards Mathematics and Self Concept in Mathematics with Achievement in Mathematics were significant and positive. (3) Regarding the extent of relationships. (3) Regarding the extent of relationships, relation of Achievement in Mathematics with Mathematics Aptitude, ability to use Symbols. Reasoning and Attitude towards Mathematics were substantial whereas those with other variables were low. (4) Achievement in Mathematics was related not only to Cognitive Variables like Intelligence, Aptitude, etc. but also to the affective variables like Attitude towards Mathematics and Self-Concept in Mathematics.

Scheerens & Basker : Components of Effectiveness Enhancing Factors (1997) based on both Cognitive and non academic factors (N. A.)

Factors	**Components**
Achievements, orientation high expectations **(N. A.)**	* clear focus on the mastering of basic subject * high expectations (school level) * high expectations (teacher level) * records on pupil achievement
Educational leadership	* general leadership skills * school leader as information provider * participative decision-making * school leader as coordinator * meta-controller of classroom process * time spent on educational and administrative leadership * counselor and quality controller of teachers * initiator and facilitator of staff professionalization

Consensus and cohesion among staff **(N. A.)**	* types and frequency of meeting and consultations * contents of cooperation * satisfaction about co-operation * indicators of successful cooperation
Curriculum quality / opportunity to learn	* setting co-curricular priorities * choice of methods and textbooks * application of methods and textbooks * opportunity to learn * satisfaction with the curriculum
School climate **(N. A.)**	(a) Orderly atmosphere— * the importance given to an orderly climate * rules and regulations * punishment and reward * absenteeism and drop-out * good conduct and behaviour of pupils * satisfaction with orderly school climate (b) Climate in terms of effectiveness orientation and good internal relationship * proprieties in an effectiveness – enhancing school climate * perception on effectiveness–enhancing conditions * relationships between pupils * relationships between teacher and pupils * relationships between staff * relationships : the role of the head teacher

	* pupils engagement * appraisal of roles and tasks * job appraisal in terms of facilities, conditions of labour, tasks load and general satisfaction * facilities and building
Evaluative potential	* evaluation emphasis * monitoring pupils' progress * use of pupils progress * school process evaluation * use of evaluation outcomes * keeping records on pupil performance * satisfaction with evaluation activities
Parental involvement **(N. A.)**	* emphasis on parental involvement in school policy * contact with parents * satisfaction with evaluation activities
Classroom climate **(N.A.)**	* relationship within the classroom * order * work attitude * satisfaction
Effective learning time	* importance of effective time * time * monitoring of absenteeism * time at school * time at classroom level * classroom management * homework

It has been observed that from the above factors most of them are a good combination both academic activity and as well as non academic activity (N.A). Another important dimension of Teaching-Learning system is teaching strategies where nonacademic variables also play an important role. Innumerable research have been conducted in this aspect. Information processing model has been upgraded from various research corners. Existing different models have been compared with the traditional one on different subjects. Major Findings : (1) Concept attainment model of teaching was found effective in developing reasoning ability, scientific creativity as well as fostering favourable attitude of the students towards science whereas it could not foster inquisitiveness, persistency or problem awareness among them. (2) Inductive thinking model was found to promote reasoning ability, scientific creativity, problem awareness ability as well as attitude of the students towards science favourable but could not bring significant enhancement in inquisitiveness or persistency ability among them. (3) Inquiry training model of teaching was found effective in developing reasoning ability, scientific creativity, problem awareness ability and attitude of the students towards science favourably. However, this model could not bring significant gain in inquisitiveness or persistency. (4) Concept attainment model, inductive thinking model or inquiry training model did not differ in effectiveness in terms of enhancing reasoning ability or scientific creativity. (5) Inductive thinking model and inquiry training model of teaching had been rated better than concept attainment model in fostering problem awareness ability. However, inductive thinking model and inquiry training model didn't differ in fostering ability to see the problems.(6) Concept attainment model, inductive thinking model or inquiry training model did not differ in promoting attitude of the students towards science.

According to Australian Council For Educational Research (ACER), the following points are relevant to explain Teaching Learning System.

- positive relationship with learning;
- development of a positive self-concept;
- sense of self-discipline and self-worth;
- student's living skills becoming a productive and confident member of the adult world in time;
- the development of appropriate value systems; and
- the preparation of the student for the next stage of learning (McGraw et al, 1992).

Whatever the system we talk education cannot be fulfilled without merging education with nonacademic potentialities that claims to develop potentialities relating to relationship to self-concept as revealed by the research of ACER.

Since, interest of individuals are identified over broad areas like literacy, scientific, games, sports, dance, drama, recreation, amusement, etc., it becomes a matter of necessity to identify adolescents interest in areas like academic, non-academic and vocational.

The Kothari Commission (1964-66) rightly remarked that "Today classroom students are citizens of tomorrow." So it is the duty of the nation to prepare students for fortune vocations through school curriculum.

Before independence, Gandhiji gave much importance on work education. After independence various committees and commissions also provide important suggestions for making vocational oriented school curriculum. Because vocationalisation is an imperative need for national economic development and rapid social transformation. Making vocationalization an integral part of our school curriculum at he higher secondary level is a very timely innovation. It has made our educational system multi track instead of single track. It has us hired a new era in our educational set up.

Making students self-sufficient in future-life their interests in different fields should be given much importance. But at present the interests of the students in different fields should be ignored. So making vocational oriented curriculum at the higher secondary level is at the stage ignored of trial.

At present we do not have any prepared list of curriculum for higher secondary students in different fields is also waiting. In this respects the study is not worthy.

Lonis Chhen, Lawrence Manion and Keith Morris on (1999) in their book 'A Guide To Teaching Practice' mention the following teaching-learning strategies —

- establish clear expectations of pupil behaviour in the classroom and secure appropriate standards of discipline;
- create and maintain a purposeful, orderly and supportive environment for their pupils' learning;
- maintain pupils' interest and motivation;
- present learning tasks and curriculum content in a clear and stimulating manner;
- teach whole classes, groups and individuals, and determine the most appropriate learning goals and classroom contexts for using these and other teaching strategies;
- use a range of teaching techniques, and judge when and how to use them;
- employ varying forms of curriculum organisation, and monitors their effectiveness;
- communicate clearly and effectively with pupils through questioning; instructing, explaining and feedback;
- manage effectively and economically their own and their pupils time;
- make construction use of information technology and other resources fro learning;

- train pupils in the individual and collaborative study skills necessary for effective learning.

(Page No. 24)

2.4 Family Influence

Another important point for non academic potentialities is family influence on learners. The family relationships of the creative child are of interest Sten (1956) reported creative were more likes to feel that their parents were in consistent in their attitudes to them more creative as viewed by him preferred solitary creativities as children while less creative were more prove to engage in group activities.

Weisberg and Springer (1961) found that family for the highly creative children was distinctive from that of the others parental value did not stress on conformity. Father was found to interact strangely and ambivalently family unit was found not to be close more. But this study did not rate creativity of the children so it leaves unanswered the question of whether this traits runs in families.

Some components regarding teaching and learning are finely sourced from satisfaction with Teaching Questionnaire by D. Galloway, K. Baswell, F. Parckhurst, C. Boswell and K. Green, Presented below :

Correlation	Percent of with overall teachers (N = 296)	Satisfaction
1. Your relationship with pupils.	95.9	0.331
2. Your relationship with other teachers	94.3	0.245
3. Your freedom to select teachingmethods	87.5	0.308
4. The time tabling of the programme activities	87.2	0.276
5. Your freedom to select subject matter for your class(es)	84.8	0.200
6. The number of hours you teach each week	83.4	0.286

7.	Your relationship with senior staff in the school	81.8	0.184
8.	Your allocation to teaching a particular class / unit	81.8	0.149
9.	The level of pupil achievement in your class(es)	81.1	0.347
10.	The general behaviour of pupils in your class(es)	80.7	0.406

[Vol. 27, Feb. 1985, Page No. : 46 Harvard Educational Review]

According to Ron Edmonds Teaching-Learning system including the following points :

1. Strong leadership at the building level.
2. "Best practice" teaching.
3. An organizational climate that supports good work by teachers.
4. Curriculum that fosters an "instructional emphasis" or an "academic press."
5. A pupil progress measurement system that is geared more to the next lesson's teaching than the next grade's promotion.

Ana Helvia Quintero proclaims the open system of education should include teaching and learning system. Here the system is rather flexible in all dimensions reflected from the following presentation in her writing on Harvard educational review August 1989 Page No. : 358.

The educational situation more closely resembles an open system, full of contingencies and surprises. Flexibility in organisations should therefore be developed to allow teachers and principals the organiszational space to deal with new problems and opportunities. The programs initiated by our project promote co-ordination among the various school subjects, requiring communication among teachers, as well as some co-operative planning of

activities.

Since the rigidity of the usual school time schedule does not provide space for such communication, we need a more flexible time schedule to facilitate the diversity in teaching strategies and activities both in and outside the classroom that our programs encourage.

2.5 Academic Subjects and Professional Courses of Higher Secondary Students based on available related literature

Sl. No.	Academic Subject
1	Computer Engineer
2	Geography
3	Hotel Management
4	Computer Science
5	Biology
6	M. B. A.
7	M. C. A.
8	Music
9	Doctor
10	English
11	Journalism
12	Fashion Designing
13	Mathematics
14	Bio-Technology
15	Automobile Engineering
16	Micro Biology
17	Software Engineering
18	Painting
19	Architect Engineering

Sl. No.	Academic Subject
20	B. B. A.
21	Agriculture
22	Education
23	Electronic Engineering
24	Information Technology
25	Mechanical Engineering
26	Psychology
27	Work Education
28	Sanskrit
29	Physics
30	Archaeology
31	Political Science
32	Botany
33	Home Science
34	Chemistry
35	Anatomy
36	Philosophy
37	Polytechnique Engineering
38	Comparative Literature
39	Foreign Engineering
40	Library Science
41	B. C. A.
42	Nautical Science
43	Textile Designing
44	Indian Language
45	Logic
46	Accountancy

Sl. No.	Academic Subject
47	Anthropology
48	Food Technology
49	Veterinary Science
50	Oceanology
51	Statistics
52	Zoology
53	Economics
54	Commerce
55	Astrology
56	Dairy Technology
57	Ecology
58	Plastic Technology
59	Leather Technology
60	Economic Geography

2.6 Curriculum Components and Non Academic Variables

As per the recommendation of Kothari Commission (1964), the structure of secondary education in West Bengal is reorganized in 1974 and school education of ten year's duration is introduced instead of eleven year's school education. At the end of class X, West Bengal Board of Secondary Education conducts an external examination namely Madhyamik Examination to mark the termination of the first ten years of general school education. The examination is conducted on different subjects, Physical Science is one of them. In Madhyamik Examination, oral tests are also introduced along with the written tests. There are nine compulsory papers in the examination and each paper carries an hundred full marks. Ninety marks are allotted for written test and ten marks for oral test. The topics of the question papers are confined both to the syllabus of class IX and X and even to some items of class VIII.

The system of examinations has always, had its criticize. Education commissions and committees hitherto appointed by the Government of India have strongly felt the need of reforming examinations in Indian education from time to time. All the expert bodies have recommended that each Board or University should set up an examination research unit to analyse the examinations conducted under its supervision. The work of the unit should be to design the structures of examinations, to study tabulated marks for better scaling, to assist the paper-setters, in devising appropriate question items, and to make recommendations for better administration of examinations. They also pointed out that the reforms of examinations should be based on research evidence gathered, not merely through descriptive statistics such as frequency distributions, means and standard deviations of marks, but through correlational analysis of the individual questions of the existing external examinations.

There is no doubt that several attempts had been made from time to time for reformation of the examination system. In West Bengal, according to the recommendation of Kothari Commission, the Secondary Education was reorganized in 1974. All the four factors of examination namely, the syllabus, the method of teaching, the question paper and the method of assessment had undergone a lot of changes for the improvement of the evaluation system. In the present set-up of question papers of Madhyamik Examination of West Bengal Board of Secondary Education, a lot of objective type items and short answer-type questions are included instead of the essay-type questions of the traditional examination system. But in spite of all the attempts, there are various types of criticisms for the question papers in Physical Science set in the Secondary Examination. Some are of the opinion that the questions set for the examination are not satisfactory and a group comments that the questions are hard enough. Sometimes it is also uttered that it is not at all difficult for the ordinary students to score 60% marks or above. The teachers the students and the guardians did not agree as regards the difficulty level or discriminating power of the items set

in the question papers. There are other comments also. But it is not possible on the part of the investigator to discuss overall the criticisms. For this the present investigation into the question papers from a few specific angles.

A review of institutions in the country have been undertaking sustained studies in the area of examinations and evaluation during the last twenty years. Buch and lele in the M.S. University of Baroda, Gayen at IIT, Harper at the Ewing Christian College, Allahabad, Taylor at Guwahati University and Bokil at the Maharashtra State Board of Secondary Education have undertaken commendable studies. The U. G. C. has supported willing universities in setting up examination research and reform units. A substantial amount of work has been done with the grants received from the NCERT and UGC in a number of universities. About two hundred studies are available in the area of examination and achievement testing both at Ph. D. and at project levels. A review of these studies indicates definite trends of research in this area.

Chauhan (1967) in his study of University Examination found that of the students who fail, a large proportion fails not because of not knowing the subject matter but because of some external factors like defective question papers, carelessness of examiners in evaluating answer books and evaluation by incapable examiners. In a similar context, Malhotra (1972), while studying the effectiveness of question papers of matriculate examinations, found that the question papers had many defects with respect to difficulty level, coverage and weightage. As regards the type of questions used in our examinations, Lele et al. (1962) analyzed the question papers and found out only one fifth of the total questions were good, whereas the rest were poor discriminators. Lele et al. (1963) found that in essay type examinations, teachers and students did not agree as regards the difficulty level of the questions and that the selection of question on the part of students varied with the nature, clarity and difficulty level of questions. Hill (1964) found that it was beyond the competence of even the most skilled paper setter to make each question in every question paper

function exactly as he wished it to. Taylor (1963) observed that an examiner's mark had neither the sanctity as he wished it to. Taylor (1963) observed than an examiner's mark had neither the sanctity nor the precision which were usually attached to it. Different examiners showed a large variation in the mean and standard deviation of their evaluation.'

The focus of those above studies have been mentioned earlier. Gayen et. al. Have been taken the results of School Final Examination and the old Higher Secondary Examination of West Bengal Board of Secondary Examination. But the purpose of this investigator has been bit different from those mentioned earlier.

The process of evaluation is undertaken in order to determine the strengths and weakness of an existing or an under-construction curriculum so that improvement can be made in curriculum design. Evaluation results are

Existing educational programmers are criticized not only form the point of view of their content but also from the point of view of the mode in instruction. All though there is research evidence to prove that memorizing factual information contributes very little to the intellectual development of a learner.

2.7 Curriculum Objectives should be based on Activities

Curriculum is required to flow certain objectives on the fulfillment of which depends its success. These objective are all related to the learner's development. These concerns the cognitive, affective and psychomotor aspects of development. Cognitive objectives include knowledge, comprehension, application, analysis, synthesis and evolution. Affective objectives contain attention, interest attitude and values. The Psychomotor objects include imitation, manipulation, precision, articulation and naturalization. All these refer to different categories and dimensions of behaviour-development.

A curriculum construction depends upon certain guiding principles. These

are :

1. Dynamism is the first significant point without which curriculum becomes static and dead. Only a dynamic curriculum is capable of meeting all the challenges of education successfully. Dynamism is the very vital aspect of a curriculum enabling it to cope up with the ever changing needs and complexities of both life and education. So the curriculum should be a dynamic one.
2. Flexibility is another important point to be noted. It must not be closed and mechanically rigid. It need to be open responsive and receptive allowing it to react rightly under all circumstances.
3. The curriculum should not be merely the theoretical study of certain branches of knowledge, unrelated to child's life interest. Beside books various experiences and activities should be included.
4. The needs of the child should not be worked out in an artificial abstract and schematic manner from the adult point of view. Curriculum should be formed to meet the needs, the abilities and interest of the children.
5. The curriculum should be organized with an eye to meet the social demands. It will help to make a happy home, for becoming a good productive citizen, for utilizing leisure for a acquiring vocational efficiency.
6. To meet social and economic needs of the students, there must be the scope for vocational preparation.
7. Curriculum should be wide and comprehensive, irrelevant subjects or portions of a subject should be given up. The subject matter should be carefully arranged.
8. The curriculum should present a compact and comprehensive life environment at each stage of development and there should be proper integration between the curriculum of successive stages.
9. Curriculum should prepare the individual not only for the life of work but

also for the life of leisure, by exploring and developing the recreational resources. Rightly under all circumstances.

10. Only a coordinated and balanced curriculum is called a satisfactory curriculum. It should not over emphasize some elements and neglect others. It should not suffer from looseness and lack of planning.
11. An ideal curriculum submits itself to continuous evaluation and ensures its further improvement. It goes on examination itself all the time for necessary correction and modification.

Guidance of Framing Curriculum

These are as follows :

- A curriculum is always preplanned : It is not a act of activities developed on the spot or spontaneously.
- Any curriculum has four bases viz. : Social forces, knowledge of human development as provided by the accepted theories, the nature of learning, and the nature of knowledge and cognition. Thus a curriculum is meant for education in a particular society and for children of a particular age group. A curriculum that has been developed for girl student of grade Xth may quite irrelevant for boys of grade Xth preparing for a particular vocational stream.
- The goals of a curriculum are reflected in the set of educational objectives that accompany it. These objectives are the end and the given curriculum is a means to achieve them.
- A curriculum facilitates planning of instruction by teachers. Because of their intimate knowledge of children, and also how various educational objectives can be attained by children, teachers can plan a set of learning experiences that flow from a given curriculum. the quality and relevance of learning experiences determines the effectiveness of curriculum implementation.
- The teacher plan the same set of learning experiences for all students of his class. However, they differ in terms of the learning experiences and their

level and quality of participation. Their individual differences and variation in their social background are responsible for these results. Because of these, every learner has an actual curriculum which is different from the actual curriculum of other learners in the same class.

- Because of the gap between the intended curriculum, and the transacted curriculum as reflected by the individual learner's actual curriculum the teacher role assumes very importance. A teacher should not only provide flexible arrangement but also meaningful alternatives in learning. These demand professional decisions from teachers in terms of the objective, bases and criteria of the given curriculum.

CHAPTER – III

COMPONENTS OF NON ACADEMIC VARIABLES

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COMPONENTS OF NON ACADEMIC VARIABLES

3.1 Psychology of Interest as Non Academic Variables

The mental state called interest has received much attention in recent psychological literature. This is largely due to the German philosopher Herbat. The important position he has won for it in the theory of education make it deserving of some treatment in the Catholic Encyclopedia. Psychologists have disputed as to the exact meaning to be assigned to the term and precise nature of the mental state.

Interest has been variously defined as a kind of consciousness accompanying and stimulating attention, a feeling pleasant or painful directing attention – the pleasurable or painful aspect of a process of attention and as identical with attention itself. Thus it may be said, I attend to what interest me; and again, that to be interested and to attend are identical. The term interest is used also to indicate a permanent mental disposition. Thus I may have an interest in certain subjects, though they are not an object of my present attention. However interest be defined, and whether it be described as a cause of attention, an aspect of attention, or as identical with attention, its special significance lies in its intimate connection with the mental activity of attention. Attention may be defined as cognitive or intellectual energy directed towards any object. It is essentially selective, it concentrates consciousness on part of the field of mental vision, whilst it ignores other parts. Attention is also purposive in character. It focuses our mental gaze in order to attain a clearer and more distinct view. It results in a deeper and more lasting impression, and therefore, plays a vital part both in each cognitive act and in the growth of knowledge as a whole. The English Associationist school of psychology and most Empiricists, in treating of the genesis of knowledge, seem to look on the intensity or frequency of the stimulus as the most influential factor in the

process of cognition. As a matter of fact, what the mind takes in depends almost entirely on this selective action of attention. Out of the total mass of impressions, streaming in at any moment through the various channels of sense, it is only those to which attention is directed that rise to the level of intellectual life, or take real hold of the mind. What these are will be determined by interest. We are interested in what is connected with our past experience, especially in what is partly new, yet partly familiar. Pleasant feelings and painful feelings are original excitants of attention; there are other experiences also – neutral perhaps in themselves, but associated with these latter – which generate fear or hope, and so become interesting. Through our attention may be temporarily attracted by any sudden shock or unexpected impression of unusual intensity, we do not speak of this as interesting and our attention soon wanes. Isolated experiences, except in so far as they may stimulate the intellect to seek to correlate them with some previous cognitions, do not easily hold the mind. Repeated efforts are required to keep our attention fixed on an unfamiliar branch of study (as e.g. a new language or science). But in proportion as each successive act of observation or understanding leaves a deposit in the form of an idea in the memory, ready to be awakened by partially similar experiences in the future, there as gradually built up in the mind a group or system of ideas constituting our abiding knowledge of the subject. Such series of experiences, with the group of ideas thus deposited in the memory, render similar acts of cognition easy and agreeable in the future. In fact they develop a kind of appetite for future related experiences, which are henceforth assimilated, or, in Herbartian language, apperceived, with facility and satisfaction. The latent group of ideas bearing in any topic constitute an interest in the sense of a permanent disposition of the mind, whilst the feeling of the process or apperception, or assimilation, is interest viewed as a form of actual consciousness. But an event of a bizarre or novel character, which we may find difficulty in comprehending or assimilating with past experience, may also

fascinate our mind. The strange, the horrible, may thus awaken at least temporarily a keen, if morbid, interest. Still, in so far as such experiences may excite fear or anxiety, they come under the general principle that interest is associated with personal pleasure or pain.

Broadly speaking, then, all those things which arouse or sustain non-voluntary or spontaneous attention are interesting whilst phenomena to which we can attend only with voluntary efforts are uninteresting. The child is interested in its food and its play, also in any operations associated with pleasure or pain in the past. The boy is interested in his games, in those exercises which he has come to connect with his own well-being, and in branches of study which have already effected such a lodgment in the mind that new ideas and items of information are readily assimilated and associated with what has gone before. Men are interested in those subjects which have become interwoven and connected with the main occupations of their lives are listed below :

1. To study the multiple interest of the students.
2. To study the influence of interest on academic achievement.
3. To study the relationship between academic interest and non-academic interest.
4. To examine how far boys and girls differ in interest.
5. To observe whether there is any relationship existing between academic achievement and non academic interest.
6. To evaluate the difference between high achiever and low achiever in respect to interest.
7. To investigate different category of multiple interest and their relationship between academic activities.
8. To examine sexwise and group wise the level of significance in developing interest.

(1) Sing, M. H., Singh, S. P. and others (1970-80) conducted on vocational survey of + 2 stage in collaboration with vocational education unit of N. C. E. R. T., Haryana, 1981. A brief account of their study and its findings were reported below :

The main objective of the study was to identify the educational institutions where vocational courses could be started and names of the courses which could be run in the identified institutions, keeping in view :

a) The students' strength and their vocational needs,
b) Availability of physical and other facilities with minimum financial outlay,
c) Absorption and utility of the trained students in the employment market,
d) Recommended occupations offering reasonably good prospects of self-employment.

Almost all the important concerned agencies and resources at the district, sub-divisional block level panchayat level were covered in this survey. A sample set of 34 statements, five schedules three pro-forms prepared by the vocational educational unit, NCERT, New Delhi, were used for collecting data and conducting interviews at different levels of administration. Statements 1 to 34 required information from different departments pertaining to the areas of population, industrial activity, occupational capacity land utilization and holdings, area and production of different crops, agricultural implements and equipment, sources of irrigation, consumption of fertilizers, insecticides, pesticides, livestock, forest products, general education facilities, professional, technical and vocational education facilities.

The major findings were :

(1) On the basis of reports of Ambala, Bhiwani, Gurgaon, Kurukhetra, Mahendragarh, Rohtak, Sirsa and Sonapat districts, 73 educational institutions of high and higher secondary level were identified.

(2) The courses recommended in the identified institutions were boiler

attendant for two institutions, steno-typist for eight, stenographer for six, food and fruit preservation for six, poultry farming for nine, building construction technology for three repairing agricultural implements for 14, leather technology for three, nursing for eight, cutting and tailoring for 15, electronics for 14, brick-making for two, electrician for 16, fishing for 12, librarian for six, interior decoration for five, secretarial practice for seven, radio assembling for three, accountancy for nine, diploma in textiles for six, cooking and nutrition for five, painting technology for four, weaving-master for four, embroidery for seven, draftsman for three, plumber for two, canning for two, repair to household gadgets for four, plastic technology for three, textile dyeing and printing for five, salesmanship for ten and automobile technology for three institutions.

(3) A.G. Mohanty (1986) conducted a survey of vocational education in the state of Orissa since Independence (1974 – 1981). A brief account of his study and its finding were reported below :

The major objectives of the study were :

(i) To make a status survey of vocational education in the state from 1947 to 1981,

(ii) To list the types of training-cum-activities being conducted under vocational and technical education schemes and programmes,

(iii) To know the views of the heads of the vocational institutions regarding the efficacy of such programmes, including the follow-up activities, and

(iv) To suggest ways and means for further improvement.

The major findings were –

(i) Very few schools imparted vocational and technical education in 1947. By 1971 the total number rose to 106 and 124 in 1981;

(ii) More men were attracted towards technical and vocational courses than

women,

(iii) Type writing, music, dance and drama and tailoring had attracted women,

(iv) There was shortage of skilled personnel and an unemployment problem from 1961 to 1981. No follow-up programme was undertaken. There was no feedback between training institutions and fields of works. There was no placement service wing. Courses in various institutions were not need base. Since the employment prospect was bleak, many dropped out and

(v) Students coming out successful were technically unsuitable on jobs for want of adequate practical experience.

(4) D. Mangat (1988) conducted relationship of vocational maturity with intelligence socio-economic status and academic achievement. A brief account of his study and its findings were reported below :

The objectives were of D. Mangat (1988) :

(i) To study the criteria of selection of vocational courses and to study the selection of institutions where these courses were located,

(ii) To study the relevance of vocational courses to the needs and aspirations of the people in these states as also the relevance of these courses in terms of their content, linkage with other academic courses, methods of training and evaluation,

(iii) To study the types students who Matrices,

(iv) The Sharma social class scale,

(v) The locally developed Vocational Maturity Inventory having eight areas,

(vi) Self-appraisal, occupational information, goal selection, planning, problem-solving, total competence, attitude and total maturity and

(vii) The academic achievement scores of students taken from the office record of the colleges concerned. The data so collected were analysed with the help of step-wise multiple regression.

The findings of the study were :

(i) Intelligence was significantly related to various areas of vocational maturity, viz., self-appraisal, occupational information, goal selection, planning total competence and total maturity,

(ii) Socio-economic status exhibited a significant relationship with all the areas of vocational maturity barring self-appraisal and problem solving.

(iii) Academic achievement was significantly related to occupational information, planning, total competence and total maturity,

(iv) The measure of total competence depended significantly on intelligence, SES and academic achievement,

(v) Attitude opted for vocational courses in terms of their socio-economic status, academic achievement and attitudes towards vocational courses,

(vi) To study the adequacy of physical and other facilities, available in institutions in which vocational courses were located,

(vii) To identify academic, administrative and financial difficulties faced by teachers and institutions in conducting vocational courses,

(viii)To study the absorption of vocationally trained students either in employment and to study difficulties experienced by students in this regard.

(ix) To study the manpower requirement of the states in various vocations during the next ten years and the relevance of vocational courses at +2 level of this requirement and

(x) To make recommendations for the improvement of vocational education at + 2 level in the states under study.

3.2 Multiple Interests of Learners as Index of Non-academic Variables

Multiple interests basically stands for multi-dimensional approach of interest related to teaching and learning where one stimulus could be responded in many ways. If stimulus in many then how one stimulus will be bonded with

multifarious interest of the learners in a particular teaching-learning situation. As a result some responses are connected well to the particular stimulus but others are isolated with the man stimulating agent. Therefore, in these types of connection is very much significant for the betterment of correlating stimulus in various way.

In learning situation Multiple interest is to be explained in the following pattern :

1. General Example :
2. In case of Multiple Interest :

That is how in a teaching-learning system one stimulus is diversified in different responses. Bonding existing between one stimulus and many responses is to be weakened due to multiplication. Here for one stimulus four responses are generated. For each response the teacher has to provide four stimulus. Now their responses are modified to R. The way in which responses are modified to connect with a stimulus in various way is called multiplication. To explain multiplication we can classify multiple interest in two categories.

A. Multiple Interest :

To explain multiple interest we can follow the steps stated below:

i) Interest could be multiplied on the basis of a particular interest either in academic discipline or through non-academic activities.
ii) Multiplication also could occur horizontally and simultaneously in different branches of any particular subject or on the basis of different subjects.

B. Academic Interests :

In the present study the present researcher has identified seven dimensions of interest consisting of interest in Bengali, interest in Mathematics interest in English, interest in History, interest in Geography, interest in Physical Science and interest in life Science. The interests of the students in

learning different school subjects vary from person to person. Normally interest in one school subject differs from that of the others.

C. Non-academic Interests :

Besides interest in academic areas there are different kinds of interests which are not generally academic. This interest play vital role in teaching learning situations faced by the school going children. Hence the present researcher has taken up different dimensions of non-academic interest such as dancing, singing, dramatic affairs, stamp collecting, seeing pictures, writing poems, participating in cultural programmes organised by institution or in social functions, writing diaries, listening music, drawing pictures, observing sports, travelling, engaged in gardening, interior decorating, reading different kinds of novels, stories, sewing etc.

3.3 Background Knowledge

The psychology of interest being thus understood, its capital importance in the work of education becomes obvious. It is in his insistence on the value of this mental and moral force, and his systematic treatment of it in application to the business of teaching that Herbart's chief importance as an educationist lies. In proportion as the teacher can awaken and sustain the interest of the pupil, so much greater will be the facility, the rapidity and the tenacity of the mental acquisition of the latter. It must be admitted that, in beginning most branches of knowledge, a number of "dry" facts, which possess little interest of themselves for the child, have usually to be learned by sheer labour. The spontaneous attention of the pupil will not fix on and adhere with satisfaction to the ideas presented in the opening pages of a text-book. Here the teacher is compelled to demand the effort of voluntary attention, even though it be not pleasant on the part of the pupil. Still, he will wisely do his utmost to make some of the future utility of the immediate labour intelligible to the student, and in this way attach

mediate interest to that which is dull and unattractive in itself. Moreover, as the protracted effort of attention to what is in itself uninteresting is fatiguing, he will keep the lessons in these subjects short at first, and vary the monotony by enlivening and useful bite of information, illustrations, comments, and the like, which will afford relief and rest between the attacks on the substance of the lesson. At this stage the master aims at being an interesting teacher, he cannot as yet make his subject interesting, which, however, should be his ultimate goal. But, as the student advances, there is being formed in his mind an increasing group of cognitions, a growing mass of ideas about this branch of study, which makes the entrance of each new idea connected with it easier and more welcome. There is a feeling of satisfaction as each new item fits into the old, and is assimilated or "apperceived" by the latter. The pupil begins to feel that the ideas he already possesses give him a certain power to understand and manipulate the subject of his study. He has become conscious of an extension of this power with each enlargement of his knowledge, and the desire for more knowledge beings to generate this immediate interest in the subject itself being a main object of the teacher, this purpose should determine his exposition of the subject as a whole, and also guide him in dealing with the student from day to day. His exposition should be orderly, proceeding logically with proper division: the more important principles or ideas should be firmly fixed by repetition, the subdivisions located in their proper places, and their connection with the heads under which they fall made clear. By this means the ideas about the subject introduced into the mind of the pupil are built up into a rational or organized system. This secures greater command of what is already known, as well as greater facility in the reception of further knowledge, and so expedites the growth of interest. But besides this orderliness of exposition in the treatment of the matter, which might be formal and lifeless, the teacher must be continually adapting his instruction to the present condition of the pupil's mind. He must constantly keep in view what ideas the student has already acquired.

He has to stir up the related set of ideas by judicious questions or repetitions, and excite the appetite of curiosity, when about to communicate further information; he has to show the connection and bind the new item with the previous knowledge by comparison, illustration, and explanation. Finally, he is to be alive to every opportunity to generalize, and to show how the new information may be applied by setting suitable exercises or problems to be worked out by the pupil himself. He thus leads the pupil to realize his increase of power, which is one of the most effective means of fostering active interest both in the subject itself and in the relation of its various parts with the whole. Modern pedagogy, however, especially since Herbart, insists on the value of interest not only as a means, but as an educational end in itself. For the Herbartian school the aim of education should be the formation of a man of "many-sided interest". This is to be attained by the judicious cultivation of the various faculties intellectual, emotional, and moral – that is by the realization of man's entire being with all its aptitudes. It may be conceded that, with certain qualifications and reservations, there is a substantial amount of truth in this view. Worthy interests enable and enrich human life both in point of dignity and happiness. The faculties, mental and physical, clamour for exercise; man's activities will find an outlet; the capacities of his soul are given to be realized. Ceteris paribus, one good test of the educational value of any branch of study, and of the efficiency of the method by which it has been taught, is to be found in the degree in which it becomes a permanent interest to the mind. The exercise of our mental powers on a subject which has already created for itself a real interest, is accompanied by pleasure. A man's business or profession, when he is working independently for himself, should and normally does, become a topic of keen interest. But, unless his life is to be very narrow and stinted, he should also have other interests. His leisure hours require them. Wholesome intellectual, social and aesthetic interests are amongst the most effective agencies for overcoming the temptations to drink, gambling, and other

degrading forms of amusements. The pressure of ennui and idleness will develop a most harmful discontent, unless the faculties find suitable employment. The man who, after a number of years devoted exclusively to the work of making money, retires from business in order to enjoy himself, is liable to find life almost insupportable through want of interesting occupation. A subject respecting which the mind is in possession of an organized system of ideas, is necessary to man for the agreeable exercise of his faculties and such an interest requires time for its growth. Although then it is erroneous to maintain that many-sided interest or culture, however rich and varied, constitutes morality or supplies for religion, still it many be readily acknowledged that a judicious equipment of worthy interests, intellectual, aesthetic, and social is a powerful ally in the battle with evil passions, and also one of the most precious elements of human wellbeing with which a wisely planned scheme of education can equip the human soul.

Meaning of Interest :

One of the greatest problems in education is how to arouse the interest of the students. When students take interest in the activity or experience of the lesson, the problem of inattentiveness will be solved by itself. Interest is considered a powerful 'dictator', 'inspirer' and 'motivation' in the learning process.

In Latin, the word 'interest' means 'it concerns' or 'it matters'. So a thing that interest us is just something that concerns us or matters to us.

Interest is the feeling that prompts to spontaneous activity.

Once interest is aroused in studies, games, literature and good conduct, the child will consider no sacrifice and effort too great to attain proficiency.

Interest is something within the child. It is to be aroused and promoted by different means.

Effective instruction must expand the interests of young people. This is

possible by studying their interests and providing them suitable experiences.

Some of the important definitions of interest are given below to throw light on the various meanings attached to interest.

1. Berdie : "Vocational interests, both as measured by tests and as indicated by occupational choices, are expressions of liking and disliking as directed towards activities, objects and characteristics of the environment".
2. Bingham : "An interest is tendency to become absorbed in an experience and continue it."
3. Crow and Crow : "Interest may refer to the motivating force that impels us to attend to a person, a thing, or an activity or it may be the effective experience that has been stimulated by the activity itself. In other words, interests can be the cause of an activity and the result of participation of that activity."
4. James Drever. "Interest is latent attention."
5. James M. Sawhrey and Charles W. Telford define interest as "Favourable attitude towards objects."
6. Jha : "Interest is that enduring mental system which sustains conation and continues the activity called attention."
7. Jones defines interest "as a feeling of liking associated with a reaction, either actual or imagined, to a specific thing or situation".
8. Murphy : "Interests are conditioned stimuli related to goal, objects and expressed as likes or dislikes of activities, objects, characteristics of people in the environment".
9. Ross : "A thing that interests us is just something that concerns us or matter to us."
10. Strong : "Interest is an indeterminate indicator of success".
11. Super : "Interests are the product of interaction between inherited aptitude and endocrine factors on the one hand and opportunity and social evaluation on the other. Some of the things a person does will bring him

the satisfaction of mastery or the approval of his companions, and result in interests. Some of the things his associates do appeal to him and, through identification, he patterns his actions and his interests after them; if he fits the pattern reasonably well, he remains in it, but if not, he must seek another self-concept and interest pattern".

12. William McDougall : "Interest is the latent attention".

Nature and Characteristics of Interests

From the definitions given above and the studies and experiments conducted by psychologists, we may mention the following characteristics of interests.

1. Interests are closely linked with our instincts, basic needs, drives and motives.
2. Interest and attention are very much related to each other. Interest is a precondition to attention.
3. Interests are innate as well as acquired dispositions.
4. Pursuit of one's interest provides strength to an individual to resist fatigue.
5. Pursuit of one's interest provides energy and a driving force.
6. Interests are sharpened by heredity and environment.
7. Interests are not fixed and permanent.
8. Interests of the individual tend to become less varied with increasing age.
9. Generally speaking, there is some relationship between interest and ability.
10. There is some relationship between vocational and non-vocational interests.
11. Interests of the individuals differ.
12. Interests can be measured.
13. Learning becomes effective and efficient when interests of the children are satisfied.

Factors affecting Interests :

Interests are innate as well as acquired. They are influenced by a number of factors like physical and health development, age and sex an above all the environmental factors including opportunities for the development of interests. Interests depend upon our wants, attitudes and ideas. As a result of all these factors, we take interest in some things and not in others.

Personal Factors Affecting Interests :

These include –

i) Child's physical health and physical development,
ii) Child's mental health and development,
iii) Child's age,
iv) Child's sex,
v) Child's pattern of instinctive behavior,
vi) Child's aptitudes,
vii) Child's ideals, motives & wishes and
viii) Child's emotions, sentiments and complexes.

Socio-economic or Environmental Factors Affecting Child's Interests :

These are –

i) Socio-economic status of the family,
ii) Rearing practices in the family,
iii) Cultural status,
iv) Education and training and
v) Opportunities to the child for exploring interests.

Importance of Interest in the Development Programme :

Generally speaking, one's interest offers the best clue for finding our one's motivation. It has also been experienced that interest ensures achievement as it is combined with aptitude but interest without aptitude sometimes leads to

frustration.

The interests the younger children develop have a powerful influence on their behavior not only during childhood but also when they grow older. They influence the nature, form and intensity of the aspirations. Interests also serve as a strong motivating force. Since interests lead to satisfaction, the child is likely to repeat actions related to his interests and thus these interests may persist throughout his life. Interests in painting or music in adulthood, for example, usually originate during childhood. A girl who is interested in matters of health or in the functioning of the human body may aspire to be a nurse or doctor when she grows up, while a boy who has a strong interest in sports may want to become an athletic coach. It is, therefore, very important that a suitable environment should be provided from the very beginning so that children develop suitable interests from their early childhood. Their interests in toys, plays and hobbies etc. should be watched and developed carefully.

Following points should be kept in view in the development of interests of the children

1. Accept and appreciate "individual differences of children".
2. Provide children with a variety of materials and experiences to explore and to observe.
3. Encourage children to be spontaneous in their expression of ideas and feelings.
4. Appreciate every child's effort even if there is lot of scope for improvement.
5. Incorporate stories in the teaching-learning programmes because interest in various subjects is awakened through story-telling.

Making Children Interested in Classroom Work

The entire problem of teaching-learning is to secure the child's attention to a lesson. Attention is secured by arousing and maintaining interest of the

students. The presentation of learning material to the students in an interesting manner involves a multidimensional approach. All the factors involved in the teaching-learning process, namely, the students, learning material, learning environment, learning methods, teaching material, teaching methods and the teacher have to be designed and organised in such a way as all of them may contribute significantly towards the maintenance of desired interest in the learning activity at a particular time.

Following factors influence interest :

1. Goals Set Before the Pupils : A definite goal should be set before each child according to the standard expected of him. Immediate goals should be set before small children and distant goals for older ones. It must be remembered that the goals should be very clear and the children must understand these goals.

2. Complacency in the pupil should be avoided and in no case the pupil should feel that there is nothing more which he should learn and that there is no scope for improvement. R. Stramg wrote. "A little learning is a dangerous thing in so far as it may make a child content with what he has accomplished. The child's felt need for a sill is decreased once he has obtained enough proficiency to accomplish his immediate purpose. It is important, therefore that as soon as the child begins to acquire skills, be should set for himself suitable specific standards of accuracy and precision".

3. Guidance and Counselling : Suitable guidance should be given to the students in selecting the best response to their environment. Guidance in the proper selection of subjects and careers must be provided. Guidance is needed in developing proper study habits and various other areas.

4. Physical Conditions : It may be remember that interest of the learners is affected by their physical conditions and the physical classroom environment.. Bodily health, illness, malnutrition etc. all affect the maintenance of the learners. Classroom seating arrangement, light and ventilation etc. are the other physical aspects determining interest.

5. Emotional Conditions : Children should be praised when they show good results. This gives them encouragement to show all the more better results and they develop confidence, hope self-reliance and self-respect. Sympathetic attitude on the part of the teachers give stimulus and a sense of security to the students. We should discard our habit of fault-finding. This develops fear and feelings of insecurity and of inferiority and children lose interest in their work.

6. Association of Things : Thorndike points out that things which we want to go together should be put together. Many different things should be brought together as a part of one process. Then it becomes easier to make the students understand their connection. We have discussed at various places that things can be associated in a number of ways.

7. Stimulation : Best learning takes place when the teacher successful in arousing the interest of the student. The guidance of the teacher is mainly a matter of giving the right kind of stimulus to help him to learn the right things in the right way.

8. Result of the Total Situation : Interest is affected by the whole situation. It is now always possible to estimate the result of one individual factor. Learning is fruitful and permanent if the total situation is related to life.

9. Teacher's Personality: Teacher's attitude to work, his own interest in the

students, his manners, his health, his sense of creative and constructive discipline – all help in arousing, maintaining and sustaining interest of the students.

10. Organisation of Learning Experiences : Learning experiences should be organised on the psychological principles.

11. Exploitation of Learning Experiences : Learning experiences should be organised on the psychological principles.

3.4 Measurement of Interests of Students

We want to know the interest of an individual because it is one of the most impelling motives. A person may have aptitude for a vocation but if he is not interested in it, he is not likely to be successful in that vocation.

Secondly, it is felt that there is some relationship between interests and abilities. Sometimes our interest may give some indication of our abilities and therefore, it is important to measure the interest of a person.

Thirdly, measurement will indicate the probability of the actual work relating to a subject or occupation that the student is considering, well enough to indentify himself.

Fourthly, measurement may suggest alternative fields – academic and vocational which the student has not yet seriously considered.

Interest Inventories :

Interest inventories have been designed to measure interests of the school students, college students and other adults. About the usefulness of interest inventories, Jane Warters has observed, "Interest inventories are useful for helping a student to make a systematic approach to his problem of choice (choice of curricula, courses, vocations, recreational activities, and the like), for providing teachers and counselors with information regarding the student's

preferences and aversions, and for helping them to acquire a better understanding of the student's problems of choice and his need for further information and exploratory experiences".

Kuder's Preference Record :

This test can be used in the case of high school students and adults. It measures interest in ten general areas: (i) outdoor, (ii) musical, (iii) computational, (iv) scientific, (v) persuasive, (vi) literary, (vii) musical, (viii) artistic, (ix) social service, and (x) clerical.

Stewart and Brainard's Specific Interest Inventories :

There are four forms available, one each for men, boys women and girls. The forms for boys and girls are meant for age group ten to sixteen years. Each form contains 100 questions and the questions are dividend in 20 groups. Each group deals with one type of interest.

Cleeton's Vocational interest Inventory :

This inventory contains separate forms for men and women Its author claims that this is suitable for high school pupils and college students and for the youth who have left school. The form for men contains a total of 630 items to be checked and 40 questions to be answered in 'yes' or 'no'.

Strong's Vocational Interest Blank :

It is usually used for individuals who are above 17 years as according to Strong, interests stabilize at this stage.

Theoretical Preparation :

The survey in education literature reveals that with respect to aspects related to teaching-learning systems there seems to be a consensus on the following general items –

- The process of learning includes cognitive, behavioural and experimental dimensions or components.
- Teaching and learning are dual and complementary process. But in any attempt to model an educational system, the heavier part should go to the "learning side" rather than to the "teaching side".
- Learning is mainly a function of students interacting with the teaching method and subject matter variables.
- Some students learning results from instruction and some from other forms of organized experience.

Similarly, the main conditions under which the learning situation occurs are recognized as follows –

- The individual difference of the students themselves' i.e., their academic ability, their previous preparation at the secondary level, and the various motives or incentives that bring them to the university classroom.
- The nature of the learning materials, tasks, equipment, and facilities that will be involved in the academic course work including the structure and content of the academic programs themselves, the type of the teaching aids, and the other educational facilities.
- The nature and quality of instruction the student receives, the conditions of practice, guidance, mode of presentation, feedback, and other teaching dimensions.
- Situational or environmental variable that may be either direct or indirect in their influence on learning outcomes, i.e., conditions and situations affecting teaching-learning process including those as simple as class size and those as complex as the various forms of reinforcement.

3.5 Following selected activities are identified for making the inventory interest of the higher secondary students

Sl. No.	Activities Interests
1.	To make leather goods bags etc.
2.	To put small parts together as in a clock, radio, lock sewing machine etc.
3.	To draw plans for public buildings house or grounds
4.	Bargaining
5.	To know all about coal, iron and other metals and their manufacture
6.	To keep a systematic account of money spent and received
7.	To experience with chemicals combining different materials to see the effect
8.	To enquire about the price of articles in the market
9.	Regulars hours for works
10.	To know the details on atom bomb or hydrogen bomb.
11.	To rewrite sentences until they express just want to say
12.	To make a radio-set at home
13.	To answer telephone calls, give the information or massages to others
14.	To do fine engraving or carving work on wood mental etc.
15.	To repair motor cars or others machines
16.	To help others to settle their quarrels world by word
17.	To estimate the value of buildings, motor cars, plots of land etc.
18.	To make articles of wood like table, chairs, boxes etc.
19.	Drilling solders
20.	To knit socks, vests etc.
21.	Methodical work
22.	To make rope, laces etc. or small machine
23.	To feed, water and take care of cows, bullocks and horses

Sl. No.	Activities Interests
24.	To know how soap and oil, cream etc. are manufactured
25.	To go on doing the some thing mechanically for a long time
26.	Repairing clocks
27.	Looking at a field, windows
28.	To know how mental desires or mental troubles are caused
29.	To use saw, human, nails etc to repair articles
30.	Interviewing prospectus in selling

3.6 Vocational Interest of the Higher Secondary Students

Sl. No.	Vocational Interests
1.	Railway
2.	School, Teacher
3.	Professor
4.	Bank Manager
5.	Doctor
6.	Engineer
7.	Scientist
8.	Pilot
9.	Air Force
10.	Journalist
11.	Fashion Designer
12.	IAS Officer
13.	IPS Officer
14.	WBCS
15.	Judge
16.	CBI / CID
17.	Singer

Sl. No.	Vocational Interests
18.	Cartoonist
19.	Navy
20.	Police
21.	Income Tax Officer
22.	Music Director
23.	Geological Survey
24.	Business Farm Manager
25.	Private Tutor
26.	Primary School Teacher
27.	Player
28.	Artist
29.	Lawyer
30.	Army Officer
31.	Musician
32.	Film Actor
33.	Radio-Actor
34.	Food-Supplier
35.	Jewelry
36.	DVC
37.	Model
38.	Poet
39.	Librarian
40.	Business Man
41.	Medical Representative
42.	Veterinary – Surgeon
43.	Dairy Technology
44.	Publisher

Sl. No.	Vocational Interests
45.	Durgapur Steel Plant
46.	Port-Trust
47.	Tours and Travel Manager
48.	Draft Man
49.	Wholesale Dealer
50.	Jewelry Designer
51.	Telephone Operator
52.	Medical Transcriptor
53.	Broker
54.	Leather Worker
55.	Painter
56.	Farmer
57.	Wood Carver
58.	Sales Man
59.	Dairy Man
60.	Driver

CHAPTER – IV

PSYCHOLOGICAL AND VOCATIONAL BASED NON-ACADEMIC VARIABLES

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PSYCHOLOGICAL AND VOCATIONAL BASED NON-ACADEMIC VARIABLES

4.1 Introduction

Interest may be referred to the motivating force that impels us to attend person, a thing or an activity; or it may be the effective experience that has been stimulated by the activity itself. In other words, interest can be the cause of an activity and the result of participation in the activity. The direction of our thinking in influenced as our own interests are related to the situation in which we find ourselves, our behaviour, in turn, is effected by the sensory experiences and perceptual awareness that make possible the changing of relations among ideas and through processes as these are experienced and expressed.

The dynamic nature of experience gives rise to dominance of one idea at this moment and of another at the next, however, basic to the change or ideas in term of exiting environmental conditions is the influence of experience – born interests that direct our mental pattern. We may not be conscious of the fact that the very dominance of one idea over another is a selective process motivated by our interest or feeling at the moment.

School going students have few if any natural interest but acquired various interests as a result of their various experiences, in the environment of which they are a part. The teacher is concerned specially with discovering the interest already acquired at any stage of learning, so that he may plan his instruction to meet deferent levels of experimental interests.

A teacher's own enthusiasm for an interest in the learning con-tent is extremely valuable – as a means of arousing and maintaining a similar degree of enthusiasm and interest among his pupils in mastering the learning materials.

Interests are closely related to drives, motives and responses.

Interest in the preparation of a palatable food may arise a desire for good

food; interest in scientific research, mechanics or teaching, e.g. may grow out of exploratory acts stimulated by a desire to satisfy, by desire to sat-isfy one's curiosity about this activities.

The interest of young people in their appearance, cloths or activities may be awakened desire to attract members of the opposite sex, or to win approval from an admired adult.

Pattern of interest :

Here interest classify by three categories like Academic subjects interest, Non-academic interest and Vocational interest.

Interest

Academic Interest Non-academic Interest Vocational Interest

Academic interest – meaning and educational implication :

All educational and vocational guidance officers should have fair knowledge of an individual interest when he is to guide the individual to a particular branch of education or to a particular vocation.

Every day an individual has to deal with many things which come before him. He is to deal with many people, object and situations. A particular objects may be interesting to one individual but not so interesting to other. A particular game may be favorite to a particular boy while others may not favour that game. An object may have some characteristics, which make it interesting. One particular pupil may be liked or disliked by others pupils of his class.

Academic interest may be regarded as the excitement of one's felling which create in him a tendency to choose a particular activity of academic likeness or fondness or a subject instead of some other alteration to have fascination for or to pay attention to think about and to enjoy that activity or the subject matter or attachment to a discipline covering a group of academic subjects. Langer (1943)[3] said that, "our interest and determined, for the most

part, by a fusion of several need. Activities that can offer satisfaction to many deferent needs at the same time will absorb our interest. In so far as the activity associated with an interest performs this function, we find it easy and enjoyable. When it fails to meet these requirements, we lack enthusiasm and find the activity and hard work". Cronbach (1949)[1] defined interest, "as a tendency to seek out an activity or object, or tendency to choose it rather than some alternative." Mursell (1950)[2] Said that, "an interest may be described as a tendency to make consistent choices in a certain direction without external pressure and in the face of alternatives".

Interest act as a strong motivating force for an individual. Researchers have shown that achievements in school subjects are greatly influenced by nature and strength of interests. Such interests are called 'academic interest' because, the interest referred in responsible for once achievement in academic subjects. Nenon (1974)[4] reported greater academic interest and endurance by an over achieving reported greater academic interest and endurance by an over achieving group of boys and girls of superior ability as well as the general group. Lalithamma (1975)[5] observed that the achievement in Mathematics was positively related to interest in Mathematics. Achievement is also found to be a strong personal interest of adolescence because, it brings personal satisfaction as well as social recognition. Hence, from he above two research findings, there is much justification for attaching educational value to academic interest of higher secondary pupils who is mainly in the stage of adolescences.

According to Rodman et al. (1972)[6] and Viernstein and Hogan (1975)[7], "if the adolescents are interested in achievements they must be in the areas that are important to their pears. If pears are interested in academic success then good grades may be satisfactory achievement.

4.2 Non-academic Interest – Meaning and Educational Implication

Non-academic interest also play a significant and crucial role in setting

the personality pattern of the adolescents. Though, the higher secondary students are in a stage of crisis and they are interested in a variety of directions, most of which are non-academic. As mentioned earlier, adolescent boys and girls become very much interested in selecting their dress materials. They are actively interested to adopted an appearance of so called smartness simply for the sake of attracting others. It is true that they can't be blamed for this. Interest is a personality variable, it is one's own personality that directs him / her to develop interest in objects or activity or a profession or trends which is definitely different from academic subject matter or vocation unless an adolescent continues to expand his interest in dress, clothes etc. how can one become very successful as a fashion designer if one conceives interest in non-academic field like professional-artist and is a regular performer in a local jatra or theater? Where can we look for the rising of a reputed artist in Bollywood or Tollywood ? From the standpoint establishing a youth in the worldwide struggle for peaceful and decent life, nurturing of non-academic interest among the adolescent boys and girls can't be ignored. If we consider the various means of earning a living, it appears that non-academic interests are greater yielding of success of an individual than the academic interest. Almost the non-academic interest we may mention a few : singing, visiting places, playing games, boating, computer chatting etc.

Vocational Interest – Its Educational Implication :

Young men and young women face many personal, social, economic and vocational problems when they want to adjust themselves to their environmental situations. They have conceived some genuine interests relating to these problems. They require some advice and guidance from experienced persons in the process of adjustment so that may achieve their interests and fulfill their ambition and identification of their vocational interest in particular can go a long way to help in this matter.

It is not very easy to define the term 'Vocational'. 'Vocational' is, above all, a concept which is concerned with the desired development of the individual pupil with the clear and definite intention of bringing mental satisfaction, through one's own work and sincere effort so that the individual pupil as well as the society to which he belongs are both benefited.

Different people tried explain the term 'Vocational interest' in different ways. 'Vocational interest was regarded as an attempt to satisfy one's mental desire for certain ambition which the individual cherishes within himself from the early stage of his life and feels satisfied by earning his livelihood through such kind of activity in which he not only specialized himself as a result of training but process in born drives. It may be regarded as a process as well as a concept with the determination of the potentialities of the individual pupils and to the process of counseling and other techniques, it helps the pupils to make necessary adjustment to the environment, choose a course of study which is best suited to him and adopt a suitable vocation for leading a peaceful and fruitful living afterwards.

4.3 Some Theoretical Aspects

1. **The Wood Abbot Report (1937)** stressed the need for general and vocational course.

2. **The Secondary Education Commission (1952–53)** intended to make education practical, useful and life-centered. It recommended multipurpose schools with diversified courses. So that students could choose their vocation according to their capacity and interest.

3. **The Education Commission (1964–66)** laid special emphasis on the spread of vocational education. Hence knowing the vocational interest of the Higher Secondary students was an important duty for the administrator. But, though it is well known that interests play a vital part in choosing, selecting and be

successful in a vocation, no attempt have been made to help students to identify their interests. This is undoubtedly a failing of the educational system.

4. **Singh, M. H., Singh, S. P. and others (1970–80)** conducted on vocational survey of 10+2 in collaboration with vocational education unit of N. C. E. R. T., New Delhi. S. C. E. R. T., Haryana. 1931. A brief account of their study and its findings were reported below :

   The main objective of the study was to identify the educational institutions where vocational courses could be started and names of the courses which could be run in the identified institutions, keeping in view, (a) the students' strength and their vocational needs, (b) Availability of physical and other facilities with minimum financial outlay, (c) absorption and utility of the trained students in the employment market, (d) recommended occupations offering reasonably good prospects of self employment.

5. **Indian Education Commission (1882)** recommended the introduction of practical subjects in secondary school.

6. Almost all the important concerned agencies and resources at the district, sub divisional block level, Panchayat level were covered in this survey. A example set of 34 statements, five schedules, three proformas prepared by the vocational educational unit, NCERT, New Delhi, were used for collecting date and conducting interviews at different levels of administration. Statements 1 to 34 required information from different relational capacity, land utilization and holdings, area and production of different crops, agricultural implements and equipment, sources of irrigation, consumption of fertilizers, insecticides, pesticides, livestock, forest products, general education facilities, professional, technical and vocational education

facilities.

An inventory was developed and sent to 113 vocational and technical schools. An information list was developed. Thirty heads of institutions and a number of officials were interviewed percentages were calculated to analyze data.

The major findings were : (i) Very few schools imparted vocational and technical education in 1947. By 1971 the total number rose to 106 and 124 in 1981. (ii) More men were attracted towards technical and vocational courses than women. (iii) Type writing, music, dance and drama and tailoring had attracted women. (iv) There was shortage of skilled personnel and an unemployment problem from 1961 to 1981. No follow-up programme was undertaken. There was no feedback between training institutions and fields of work. There was no placement service wing. Courses in various institutions were not need based. Since the employment prospect was blank, many dropped out, (v) Students coming out successful were technically unsuitable on jobs for want of adequate practical experience.

7. **Dr. Mangat (1988)** conducted relationship of vocational maturity with intelligence socio-economic status and academic achievement. A brief account of his study and its findings were reported below :

The objective of the study were (i) to ascertain the factors contributing to vocational maturity (ii) to study the relationship between vocational maturity and measures of intelligence, socio-economic status and academic achievement, (iii) to identify the best set of independent variables predicting vocational maturity.

The samples of the study consisted of 525 students studying in B.A./ B. Sc. (final year) in colleges of Punjab. They were administered the following tools : Raven's progressive was not dependent upon independent measures of intelligence. SES and academic achievement, total vocational

maturity dependent on intelligence. SES and academic achievements and these three independent variables contributed to total vocational maturity , SES was found to be the best predictor of total vocational maturity.

8. In West Bengal, the number of schools offering vocational education at 10+2 level was 57. However, five of item reported that they had not been teaching vocational subjects during the year 1984-85. Out of 52 schools imparting vocational education at 10+2 level, 45 institutions sent their information. Similar information was collected from heads of 24 institutions, 89 teachers of vocational subjects, 317 percent students and 52 past students. Questionnaires and interview scheduled were used as tools of study. These included a questionnaire for teachers, questionnaire for students studying vocational subjects and interview schedule for past students. In addition, state government reports and statistics in relation to education in particular, as also reports published by N. C. E. R. T. were the important sources of data.

Some important findings were given below :

In West Bengal it was reported that (1) the state government did not give any encouragement to the introduction of vocational education at the 10+2 stage. (2) Though-2 classes were attached both to schools and colleges in the state, the vocational stream was introduced only in classes attached to schools. (3) Infrastructure for vocationalization in three areas only, viz. agriculture, engineering and commerce. They had introduced some courses in paramedical science, but these had been discontinued. The state did not have courses in home science at this level (4) The state did not pay any special grant for vocational education. Institutions had to meet the recurring expenditure from fees received from students. This money was often inadequate and hence vocational education suffered (5) Some Junior Technical Diploma institutions had been allowed to conduct XI and XII technical classes.

B. Review of Foreign Studies :

(i) B. Gogates (1987) conducted a study of vocational of education at Higher Secondary in West Bengal. (Planning Commission financed). A brief account of the study and its findings were reported below :

The objectives were (i) To study the criteria of selection if vocational courses and to study the selection of institutions where these courses were located, (ii) To study the relevance to vocational courses to the needs and aspirations of the people in these states as also the relevance of these courses in terms of their content, linkage with other academic courses, methods of training and evaluation, (iii) To study the types of students who matrices, (iv) The Sharma social class scale, (v) The locally developed vocational maturity inventory having eight areas, viz. self appraisal, occupational information, goal selection, planning, problem-solving, total competence, attitude and total maturity, (vi) The academic achievement scores of students taken from the office record of the colleges concerned the data so collected were analyzed with the help of step-wise multiple regression.

The findings of the study were : (i) Intelligence was significantly related to various areas of vocational maturity, viz., sell-appraisal, occupational information, goal selection, planning total competence and total maturity, (ii) Socio-economic status exhibited a significant relationship with all the areas of vocational maturity barring self-appraisal and problem solving, (iii) Academic achievement was significantly related to occupational information, planning, total competence, and total maturity, (iv) The measure of total competence depended significantly on intelligence, SES and academic achievement (v) Attitude opted for vocational courses in ten-ns of their socio-economic status, academic achievement and attitudes towards vocational courses, (vi) to study the adequacy of physical and other facilities, available in institutions in which vocational courses were located, (vii) to identify academic, administrative and financial difficulties faced by teachers and institutions in

conducting vocational counsel, (viii) To study the absorption of vocationally trained students either in employment and to study difficulties experienced by students in this regard. (ix) To study the manpower requirement of the states various vocations during the next ten years and the relevance of vocational courses at +2 level of this requirement and, (x) To make recommendations for the improvement of vocational education at +2 level in the states under study.

(ii) Holland (1973 / 1985) theorized that career choices are largely a function of personal factors, for example, personality traits, self-knowledge, occupational knowledge etc. and environmental factors, for example, family, school etc. In making career choices, individuals seek the type of environment that matches, or is congruent with, their personality type. Holland's construct of consistency, or stability, in the expression of vocational themes and basic interests was the primary focus of his study.

(iii) The stability of career interests continues to receive the attention of researchers and practitioners (Campbell, 1066 and Hansen, 1984). Ac-cording to them, the young adult sample yielded coefficients of – 0.28 to 0.96 for basic interests and 0.17 to 0.97 for occupational themes. Similarly **Swanson and Hansen (1988)** found that college students were highly stable in their career interests over 12 years, and that these interests were significantly related to self-ratings of stability.

(iv) Diamond (1975) has argued that as because people increasingly see traditional sex roles as arbitrary, sex differences in career interests may be diminishing. In contrast, Hansen (1984) has conducted that, despite heightened consciousness, sex differences in vocational interests have remained stable. In addition to the relevance of gender in emerging career preferences, Holland (1962) suggested that families, particularly their work patterns and social position, have a profound impact on their children's career interests. Holland

reported that father's occupation was significantly related to son's career interests.

(v) The University of Alberta Career and Placement Services (2003), in partnership with JVIS. COM. brings the **Jackson Vocational Interest Survey (JVIS),** the career and education planning tool that has already helped over hail a million people like you.

Based on years of research, the JVIS accurately measures your interests, showing how they relate to the worlds of study and work, and mapping out, route to interesting career.

The details JVIS report graphs your scores on 34 work roles and work styles, and then goes on to compare your interest pattern with students in a wide variety of college majors, and people already working in a broad range of careers. The report is packed with detailed information, including the professional organizations, suggested readings, and web links that match our interests. The personal JVIS report is a valuable planning tool that will renew your hope and interest in your career vocational evaluation is a comprehensive, system process in which students and staff work together to identify and assess the student's vocational interests, abilities, strengths, weaknesses, aptitudes and functional limitations relative to the students' preferred rehabilitation goal or employment outcome.

Vocational evaluation is an educational process in which the student obtains greater self and work knowledge. They learn about the functional impact of their disability upon career options and identify barriers to employment. However, they also identify transferable skills, vocational potential and reasonable accommodations or assistive technology to remove barriers to employment. The evaluation process encourages the individual to become more personally involved in the planning and development of their occupational careers. The acquisition of knowledge regarding themselves and

the requirements involved in occupational areas of interest empowers the individual and establishes a greater degree of confidence in career decision making.

The outcome is a comprehensive vocational evaluation report that is used for further rehabilitation planning towards successful, sustained employment outcomes. This report outlines the services received at Woodrow Wilson Rehabilitation Center (WWRC) and the student's performance during the vocational evaluation on process. It identifies the student's vocational interests, aptitudes, acquired skills, functional limitations, and barriers to employment. The report also recommends services to enhance the student's ability to fully participate in a rehabilitation program, achieve his / her individual rehabilitation goals, and maximize their employment potential.

Examples of services recommended to enhance rehabilitation potential include : assistive technology / devices; reasonable job accommodation; further physical restoration, academic instruction, work adjustment training, vocational training, independent living skills instruction; mental health services and supported employment options.

Information and recommendations from the vocational evaluation may be used, as appropriate by the DRS Rehabilitation Counselor (or other sponsor) and the student in developing the student's individual plan for employment (IPE) of by school personnel, the student and his / her family in developing the student's individual education program (IEP).

Comprehensive Vocational Assessment :

A comprehensive evaluation of academic and vocational skills, interest and aptitudes which utilizes interviews, observation, psychometrics, administration of WWRC developed work samples / activities, career exploration, vocational guidance and counseling. Utilization of a hand-on experimental work sample approach with center-developed work samples /

activities, and acquire knowledge relative to individual vocational interests and abilities. Primary assessment components include :

- Work behavior and social skills,
- Occupational performance skills and abilities,
- Strength / assets relative to successful employment outcomes,
- Barriers to employment, and
- Assistive technology and accommodation needs.

Vocational evaluators develop a cumulative listing of these assessment findings and recommendations for integration with the final discharge report.

Career information is available through individual counseling and guidance as well as the Discovery and Career Labs which provide information ranging from an introduction to the world-of-work to specific job requirements. Sources of information include : Internet web sites, career connect, VA VIEW Career Search & Profile, VA VIEW College Search, OASYS, the Guide o Occupational Exploration (GOE), the Dictionary of Occupational Titles (DOT), The Job Box and The Career Box, informational videotapes and catalogs for four year and community colleges, and a variety of pencil / paper activities.

(vi) On January 21, 2005 Judy Ralph reached a milestone – 20 years of employment with The Are of Hunterdon Country, Judy began working at The Arc in 1985, teaching adults with developmental disabilities daily living skills, practical arts and personal awareness. Her prior professional experience as a teacher and in therapeutic recreation gave Judy many of the skills needs in this new venture. During the first year when experiencing challenges, she headed the advice of friends to give the job a full year so she could put the experience on a resume. The position was never viewed by Judy as a long-term situation.

Judy was The Arc's first supported employment employee, and she has since held many other positions at The Arc. Currently, she work with Arc.

industries in its community immersion program. The first group of gentlemen with whom she worked had special needs. Their skills, abilities, personalities and behaviours were diverse and challenging. Judy recalls "I spent months just trying to get them to become really aware of each other. Helping each other was a big thing within the group. They volunteered at a variety of places : the Hunterdon Country Arboretum where they help take care of the park and meals on wheels where they help deliver meals. Each individual has an opportunity to shine, to be a leader in the group. They are learning marketable skills. Their growth is recognized by a lot of other people."

Judy introduced the gentlemen to Zoey, her yellow Labrador Retriever and registered Therapy Dog. "Two of the four were afraid of dogs in the beginning, but they both learned to handle and help take care Zoey. Working with the dog has taught them a lot of responsibility. Zoey has become an integral part of the group". Judy explained. Judy's 'guys' take Zoey to visit at point Breeze, an Arc. day program in French town, on Tuesday and to Arc. industries, another Arc day program in Flemington. Clients who rarely interact with Zoey will seek her out and stroke her over and over when they are upset. Knowledge that yielding and screaming would upset her, the consumers are on their best behavior when around Zoey.

Judy has won awards throughout her service to the Arc. She was recognized by the **New Jersey Association for Supported Employment (NJAPSE)** as a job coach of the year. She was also honored by the New Jersey Association for Community Providers over the years, Judy has been named Direct Support Specialist of the year and Employee of the Month at the Arc.

A pupil may interest to become an engineer but he may not have due mechanical and numerical aptitude needs to prosecute studies successfully in an engineering college. Again he may not process even a little bit of spatial and drawing ability. In this case, if he joins an engineering courses, he will not be able to complete the course successfully. Measures of interest will simply

indicate that the pupil will get mental satisfaction in the activity which he likes most. His success in the activity will depend upon many factors and his general ability is one of them.

On the basis of the theory of motivation, it is known that, an individual having high ability for doing a work, will also process high degree of interest for that work. Our common belief is that, a man doing a work successfully surely possesses high degree of interest for that work. We think that there is some relationship between an individual's vocational academic and non-academic interests and one's potentiality for the manifestation of this interest in terms of two categories – best-liked and least-liked which in fact in a revelation of one's positive and negative interest. By using an activity checklist one may get an idea of the nature of things done by pupils on his own. When direct questions are put, a pupil will tell or write what activities or objects are liked by him. These procedures will give an idea of the pupil's interest to the counselor.

Several studies reported changes in likes and dislikes of adolescents regarding difference in age and se [Pressey, 1946, Horrocks and Thompson 1946 Thompson and Horrocks 1947]. Arora, 1986 studied sex-wise degrees of importance of motivating students to pursue higher education.

Since, interest of individuals are identified over broad areas like literacy, scientific, games, sports, dance, drama, recreation, amusement, etc., it becomes a matter of necessity to identify adolescents interest in areas like academic, non-academic and vocational.

The Kothari Commission (1964-66) rightly remarked that "Today classroom students are citizens of tomorrow." So it is the duty of the nation to prepare students for fortune vocations through school curriculum.

Before independence, Gandhi, Gopabandhy gave much importance on work education. After independence various committees and commissions also provide important suggestions for making vocational oriented school curriculum. Because vocationalisation is an imperative need for

national economic development and rapid social transformation. Making vocationalization an integral part of our school curriculum at he higher secondary level is a very timely innovation. It has made our educational system multi track instead of single track. It has us hired a new era in our educational set up.

Making students self-sufficient in future-life their interests in different fields should be given much importance. But at present the interests of the students in different fields should be ignored. So making vocational oriented curriculum at the higher secondary level is at the stage ignored of trial.

At present we do not have any prepared list of curriculum for higher secondary students in different fields is also waiting. In this respects the study is not worthy.

Assumption :

In order to execute her study systematically the investigator formulated the following assumptions :

1. Students are the best judges of their interests.
2. Students of XI and XII are matured and educated enough to do self assessment objectively.
3. An academic subject in liked or disliked according to the interests of the students.
4. Non-academic and activities may be liked or disliked according to the interests of the students.
5. A vocation liked or disliked according to the interests of the candidate.
6. 'Students' interest may be identified through student's checking an exhaustive list of interested.

i) **Academic Subject :** The subjects having to do with schools and schools studies.

ii) **Non-academic :** It too much concerned with art, play and amusements.

iii) **Checklist :** It is basically a list of items to which an individual reports the presence or absence of a particular one. In psychology it is use as a self reporting instrument, in such a case, the checklist contains a list absence of a particular traits in his case by checking or not checking a particular item.

iv) **Interest :** A feeling of waiting to know, do, own or share in.

v) **Vocation :** It refers to a particular occupation, business, profession or trade.

vi) **Higher Secondary School :** The school teaching higher secondary classes or having higher secondary sections are known as higher secondary schools.

vii) **Urban Area :**

1. Constituting a city or town.
2. Characteristics of the city as distinguished from the country (Guralnik 1975, 824).

viii) **Rural Area :**

1. Outside a city or town.
2. The characteristics of rural area are not similar from city or town.

ix) **Survey :** According to the American Dictionary of the English Language (1969) – to examine carefully and methodically anything in a compressive way is called a survey.

4.4 Tool No-1 – Construction of a Questionnaire on Academic, Non-Academic and Vocational Interest of the Higher Secondary Students

The researcher first made a through survey of the literature dealing with academic, non-academic and vocational interests of the higher secondary students. Thus he could obtain a source from which items of the questionnaire can be selected under each head, namely academic, non-academic, and vocational. Initially, there was a list of 100 different academic subjects prepared

by a researcher. The list contains academic subjects like Agriculture, Biology Geography, and Mathematics etc. A group of higher secondary students (N = 1000) were asked to identify 85 such items secondary students the researcher got a list of 81 items. For the purpose of farming a questionnaire dimension, academic subjects, he desired to introduce 3 types of response categories. There were like (L), Indifferent (I) and Dislike (D).

In the same way the researcher asked the 100 higher secondary students to eliminate those non-academic subject matters in which they had no interest at all. It was thus found that 100 students were able to identify 43 non-academic subjects and items of information about which they were concerned from a list 60 items. The researcher was thus able to construct the non-academic questionnaire response categories L, I. D as indicated in the cases of academic interest.

Likewise, the researcher prepared a list of activity interests covering a wide range of interest activities of higher secondary students. The number of items activity interest initially was 125. The higher secondary students were asked to identify those activity interests in which they were least concerned. The majority, about 85% of the students indicated 84 such items in which they were least concerned. So the activity interest were finally prepared 84 items.

Further, a list of 100 different vocational prepared by the researcher. The list contains vocations like artist, lecturer, judge, telephone operator etc. A group of higher secondary students (N = 100) were asked to identify 100 such items which all of them preferred to accept. Considering the responses of 100 such higher secondary students the researcher got a list 86 items. For the purpose of farming a questionnaire on the dimension, vocation, she desired to introduce 3 types of response categories, L. I. and D.

Researcher was thus able to give a final shape to final draft of the questionnaire. The following are the steps for preparing the different checklist.

Step-1 : Identification of all possible interests in different fields of the best

liked and the least liked of Higher Secondary Students from available sources.

Step-2 : Arranging the interest of the students randomly in 8 respective lists.

Step-3 : Administration of the lists on a large sample of student of class XI and XII (with boys and girls) who would be asked to check of the lists the best liked and the least liked interests of students according to their choice.

Step-4 : Counting of the checks on each item and expressing the total number of checks of each item as a percentage of maximum possible checks which was equal to the number of items in the sample.

Step-5 : Ranking on the interests of the each list according to the percentage of check of them.

Step-6 : In academic subject selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

In non-academic subject selecting the first 15 best-like and last 15 least like (according to mars) of interest of the student.

In activities selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

In vocation selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

Step-7 : Preparation of the final check list.

Step-8 : Determining the reliability of the list.

Step-9 : Determining the validity of the list.

(a) Identification of specific interest under each of the dimension, academic, non-academic and vocational :

The investigator thought that the students themselves were the best sources for obtaining the interests in different fields of the best-liked and the least liked students. The investigator also identified some sources from which interests of students in different fields could be collected. These were as follows :

i) New Education in India.

ii) The Encyclopedia of Education.

iii) Secondary Education Commission — Technical and Vocational Education.

iv) Kothari Commission - Vocational, Technical and Engineering Education.

v) Some works on Vocational, Academic, Recreational Education.

(b) Arrangement of the interests pattern of higher secondary students through randomization :

The interests in different fields of the students identified for each checklist were then given serial number on the basis of serial number. The serial numbers were one by one selected by lottery method as the fist statement, second statement and so on, In this way the four preliminary form of the checklist were obtained. These four checklists were as follows :

i) Preliminary list of the academic subject interests of the students.

ii) Preliminary list of the non-academic interests of the students.

iii) Preliminary list of the activities interests of the students.

iv) Preliminary list of the vocational interests of the students.

(c) Administration of the questionnaire on a sample of higher secondary students for classifying items under two categories – best-liked and least-liked :

The school students were the best judges of their interests in different fields. Therefore, the investigation prepared two checklist, one for the best-liked and other for the least-liked interests of the students. Academic subjects list containing 81 items, non-academic list containing 43 items, activities list containing 84 items and vocational list containing 43 items, activities list containing 84 items and vocational list containing 86 items and administered them on a man dimly selected students population of boys and girls of class XI and XII in four schools. The schools were situated in urban and rural areas of West Bengal.

(d) Counting the number of items and expressing the total number of checks of each items as a percentage of maximum possible checks :

The investigator countered the checks of the interests and converted the total number of check to each interest to percentage of the total number of students. There were about two hundred and twenty seven Students both urban-rural and boys-girls. There fore a interest that was checked 'say' by one hundred fifty students was given the percentage seventy five.

(e) Determining the rank on the interest of each list according to the percentage of check on them :

The interests were them ranked according to their percentage of checks in academic subjects the first 30 items of the highest ranking or best-liked interests and the last 30 items of the lowest ranking least-liked interests of the students were made into a list in rank order and list was named the highest ranking or best-liked academic subjects interests of the students and the other list was named the highest ranking least liked school subjects interests of the students.

In non-academic interests list the first 15 items of the highest ranking or best-liked and the last 15 items of the highest ranking or least-liked interests of the students were made into list in rank order and the list was named the highest ranking best liked non-academic interests of the students and the other list was named the highest ranking least liked amusement interests of the students.

In activities list the first 30 items of the highest ranking of best liked and the last 30 items of the lowest ranking or least liked interests of the students were made into a list in rank order and the list was named the highest ranking best-liked activities interests of the students and the other list was named highest ranking least liked activities interests of the students.

In vocation the first 30 items of the highest ranking or best interests and the last 30 items of the lowest ranking or least-liked interests of the students were made into a list in rank order and the list was named the higher ranking

best-liked vocational interests of the students and the other list was the highest ranking least-liked vocational interests of the students.

4.5 Ranking of the Best-liked of the Academic Subjects and Professional Courses Higher Secondary Students

Sl. No.	Item No.	Academic Subject	Rank
1	21	Computer Engineer	1
2	37	Geography	2
3	43	Hotel Management	3
4	17	Computer Science	4
5	12	Biology	5
6	15	M. B. A.	6
7	60	M. C. A	7
8	54	Music	8
9	24	Doctor	9
10	27	English	10
11	48	Journalism	11
12	35	Fashion Designing	12
13	53	Mathematics	13
14	14	Bio-Technology	14
15	4	Automobile Engineering	15
16	57	Micro Biology	16
17	77	Software Engineering	17
18	68	Painting	18
19	5	Architect Engineering	19
20	15	B. B. A.	20
21	1	Agriculture	21
22	28	Education	22

Sl. No.	Item No.	Academic Subject	Rank
23	31	Electronic Engineering	23
24	45	Information Technology	24
25	59	Mechanical Engineering	25
26	66	Psychology	26
27	80	Work Education	27
28	75	Sanskrit	28
29	65	Physics	29
30	9	Archaeology	30

4.6 Ranking of the least-liked of the Academic Subjects and Professional Courses Higher Secondary Students

Sl. No.	Item No.	Academic Subject	Rank
1	70	Political Science	52
2	13	Botany	53
3	42	Home Science	54
4	19	Chemistry	55
5	10	Anatomy	56
6	67	Philosophy	57
7	71	Polytechnique Engineering	58
8	20	Comparative Literature	59
9	32	Foreign Engineering	60
10	51	Library Science	61
11	11	B. C. A.	62
12	62	Nautical Science	63
13	78	Textile Designing	64
14	44	Indian Language	65
15	50	Logic	66

Sl. No.	Item No.	Academic Subject	Rank
16	6	Accountancy	67
17	2	Anthropology	68
18	34	Food Technology	69
19	79	Veterinary Science	70
20	63	Oceanology	71
21	74	Statistics	72
22	81	Zoology	73
23	29	Economics	74
24	18	Commerce	75
25	8	Astrology	76
26	25	Dairy Technology	77
27	30	Ecology	78
28	69	Plastic Technology	79
29	52	Leather Technology	80
30	26	Economic Geography	81

4.7 Ranking of the Best-liked Non-Academic Interests of the Higher Secondary Students

Sl. No.	Item No.	Non-Academic Subject	Rank
1	121	Visiting Zoo	1
2	101	Observing Nature	2
3	120	Visiting Places	3
4	107	Reading News Paper	4
5	98	Listening to F. M. Radio	5
6	123	Watching T. V.	6
7	111	Singing	7
8	86	Contacting Friends	8

Sl. No.	Item No.	Non-Academic Subject	Rank
9	102	Painting	9
10	109	Riding	10
11	103	Playing Games	11
12	104	Playing Computer Games	12
13	119	Taking Part in Debate	13
14	118	Taking Part in Quiz	14
15	122	Watching Cinema	15

4.8 Ranking of the Least-liked Non-Academic Interests of the Higher Secondary Students

Sl. No.	Item No.	Non-Academic Subject	Rank
1	114	Solving Puzzles	29
2	105	Poetry	30
3	115	Swimming	31
4	108	Reading Novel	32
5	100	Making Soft toys	33
6	90	Dancing	34
7	117	Talking long walks	35
8	85	Clay Modeling	36
9	95	Gossiping	37
10	110	Remaining Idle	38
11	99	Modeling	39
12	124	Writing Letters	40
13	113	Smoking	41
14	112	Shopping	42
15	93	Fortune Telling	43

4.9 Ranking of the Best-liked Activities Interests of the Higher Secondary Students

Sl. No.	Item No.	Activities Interests	Rank
1	147	Teaching Children	52
2	148	Teaching Adult	53
3	140	Organizing Play	54
4	172	To sell ticket for a lottery or for you're your school show	55
5	131	Giving 'fist aid'	56
6	129	Decorating your room with flowers	57
7	187	To be placed making arrangement for school sports or concerts	58
8	157	To study the air rules of the world	59
9	155	To draw attractive designs for cover pages of books or magazines	60
10	175	To make attractive design and posters for advertising	61
11	145	Raising money for charity	62
12	187	To know how sound is record on gramophone record	63
13	132	Handling horses	64
14	174	To draw cartoons or humorous sketches of persons or animals	65
15	127	Contributing to charities	66
16	161	To become an officer on ship	67
17	135	Living in a city	68
18	193	Take part in debates	69
19	142	Raising flowers and vegetables	70

Sl. No.	Item No.	Activities Interests	Rank
20	151	To belong to army, navy or air force when there is no war	71
21	179	To write articles for school paper or a local news paper	72
22	160	To organize a club or society and plan some work for every for every one	73
23	158	To make models airplanes, ship, motor car etc.	74
24	168	To drive a railway engine	75
25	182	To see an operation being performed by a surgeon	76
26	207	To visit sick persons in hospital	77
27	130	Entertaining others	78
28	138	Meeting and directing people	79
29	208	Writing personal letters	80
30	167	To make and write stories of your own	81

4.10 Ranking of the Least-liked Activities Interests of the Higher Secondary Students

Sl. No.	Item No.	Activities Interests	Rank
1	165	To make leather goods bags etc.	55
2	153	To put small parts together as in a clock, radio, lock sewing machine etc	56
3	150	To draw plans for public buildings house or grounds	57
4	126	Bargaining	58
5	192	To know all about coal, iron and other metals and their manufacture	59

Sl. No.	Item No.	Activities Interests	Rank
6	166	To keep a systematic account of money spent and received	60
7	186	To experience with chemicals combining different materials to see the effect	61
8	169	To enquire about the price of articles in the market	62
9	144	Regulars hours for works	63
10	203	To know the details on atom bomb or hydrogen bomb.	64
11	190	To rewrite sentences until they express just want to say	65
12	181	To make a radio set at home	66
13	176	To answer telephone calls, give the information or massages to others	67
14	170	To do fine engraving or carving work on wood mental etc.	68
15	152	To repair motor cars or others machines	69
16	204	To help others to settle their quarrels world by word	70
17	191	To estimate the value of buildings, motor cars, plots of land etc.	71
18	185	To make articles of wood like table, chairs, boxes etc.	72
19	128	Drilling Solders	73
20	205	To knit socks, vests etc.	74
21	137	Methodical work	75
22	159	To make rope, laces etc. or small machine	76

Sl. No.	Item No.	Activities Interests	Rank
23	188	To feed, water and take care of cows, bullocks and horses	77
24	202	To know how soap and oil, cream etc. are manufactured	78
25	183	To go on doing the some thing mechanically for a long time	79
26	143	Repairing clocks	80
27	136	Looking at a field, windows	81
28	198	To know how mental desires or mental troubles are caused	82
29	194	To use saw, human, nails etc to repair articles	83
30	133	Interviewing prospectus in selling	84

4.11 Ranking of the Best-liked Vocational Interest of the Higher Secondary Students

Sl. No.	Item No.	Vocational Interests	Rank
1	280	Railway	1
2	283	School Teacher	2
3	275	Professor	3
4	218	Bank Manager	4
5	229	Doctor	5
6	236	Engineer	6
7	281	Scientist	7
8	265	Pilot	8
9	214	Air Force	9
10	250	Journalist	10
11	238	Fashion Designer	11

Sl. No.	Item No.	Vocational Interests	Rank
12	245	IAS Officer	12
13	246	IPS Officer	13
14	291	WBCS	14
15	249	Judge	15
16	224	CBI / CID	16
17	282	Singer	17
18	225	Cartoonist	18
19	263	Navy	19
20	276	Police	20
21	248	Income Tax Officer	21
22	258	Music Director	22
23	242	Geological Survey	23
24	218	Business Farm Manager	24
25	273	Private Tutor	25
26	268	Primary School Teacher	26
27	267	Player	27
28	210	Artist	28
29	256	Lawyer	29
30	212	Army Officer	30

4.12 Ranking of the Least-liked Vocational Interests of the Higher Secondary Students

Sl. No.	Item No.	Vocational Interests	Rank
1	257	Musician	57
2	239	Film Actor	58
3	279	Radio-Actor	59
4	240	Food-Supply	60

Sl. No.	Item No.	Vocational Interests	Rank
5	251	Jewelry	61
6	230	DVC	62
7	259	Model	63
8	266	Poet	64
9	254	Librarian	65
10	222	Business Man	66
11	261	Medical Representative	67
12	290	Veterinary – Surgeon	68
13	232	Dairy Technology	69
14	270	Publisher	70
15	231	Durgapur Steel Plant	71
16	278	Port-Trust	72
17	288	Tours and Travel Manager	73
18	234	Draft Man	74
19	294	Whole Dealer	75
20	252	Jewelry Designer	76
21	287	Telephone Operator	77
22	260	Medical Transcriptor	78
23	221	Broker	79
24	255	Leather Worker	80
25	274	Painter	81
26	241	Farmer	82
27	293	Wood Carver	83
28	284	Sales Man	84
29	233	Dairy Man	85
30	235	Driver	86

4.13 Preparation of the Final Checklist

In order to finalize the checklist, the investigator transmitted rank order to items on each list scores from the percentage position. These were by means of table provided by H. E. Garrett.

In which R was the rank of the items of the checklist and N was the number of items ranked. From this percentage position the score of the item on a scale of 10 points were read from the table 49 provided by H.E. Garrett. Since the Normal probability curve contains a maximum number of 100 cases, consideration of percentage position on a scale of 100 would yield cases, more than 100. And hence, a scale of 10 points is considered.

4.14 Final List of the Best-Liked Academic Subjects

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	21	Computer Engineer	0.17	9.9
2	37	Geography	0.5	9.5
3	43	Hotel Management	0.83	9.4
4	17	Computer Science	1.17	9.2
5	12	Biology	1.5	9.1
6	15	M.B.A.	1.83	8.9
7	60	M. C. A	2.17	8.8
8	54	Music	2.5	8.7
9	24	Doctor	2.83	8.7
10	27	English	3.17	8.6
11	48	Journalism	3.5	8.5
12	35	Fashion Designing	3.83	8.4
13	53	Mathematics	4.17	8.3
14	14	Bio-Technology	4.5	8.3

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
15	4	Automobile Engineering	4.83	8.2
16	57	Micro Biology	5.17	8.1
17	77	Software Engineering	5.5	8.1
18	68	Painting	5.83	8.1
19	5	Architect Engineering	6.17	8.0
20	15	B. B. A	6.5	8.0
21	1	Agriculture	6.83	7.9
22	28	Education	7.17	7.8
23	31	Electronic Engineering	7.5	7.8
24	45	Information Technology	7.83	7.8
25	59	Mechanical Engineering	8.17	7.7
26	66	Psychology	8.5	7.7
27	80	Work Education	8.83	7.7
28	75	Sanskrit	9.17	7.6
29	65	Physics	9.5	7.6
30	9	Archaeology	9.83	7.6

4.15 Final List of the Least-Liked Academic Subjects

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	70	Political Science	17.17	6.9
2	13	Botany	17.5	6.9
3	42	Home Science	17.83	6.9
4	19	Chemistry	18.17	6.8
5	10	Anatomy	18.5	6.8
6	67	Philosophy	18.83	6.8

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
7	71	Polytechnique Engineering	19.17	6.7
8	20	Comparative Literature	19.5	6.7
9	32	Foreign Engineering	19.83	6.7
10	51	Library Science	20.17	6.6
11	11	BCA	20.5	6.6
12	62	Nautical Science	20.83	6.6
13	78	Textile Designing	21.17	6.6
14	44	Indian Language	21.5	6.6
15	50	Logic	21.83	6.6
16	6	Accountancy	22.17	6.5
17	2	Food Technology	22.5	6.5
18	34	Veterinary Science	22.83	6.5
19	79	Oceanology	23.17	6.4
20	63	Statistics	23.5	6.4
21	74	Zoology	23.83	6.4
22	81	Economics	24.17	6.4
23	29	Commerce	24.5	6.4
24	18	Astrology	24.83	6.4
25	8	Dairy Technology	25.17	6.3
26	25	Ecology	25.5	6.3
27	30	Plastic Technology	25.83	6.3
28	69	Leather Technology	26.17	6.3
29	52	Economic Geography	26.5	6.2
30	26	Anthropology	26.83	6.2

4.16 Final List of the Best-Liked Non-Academic Interest

Sl. No.	Item No.	Non-Academic Interest	Percentage Score	Position
1	121	Visiting Zoo	0.33	9.7
2	101	Observing Nature	1	9.2
3	120	Visiting Places	1.67	9.0
4	107	Reading News Paper	2.33	8.8
5	98	Listening to F. M. Radio	3	8.6
6	123	Watching T. V.	3.67	8.5
7	111	Singing	4.33	8.3
8	86	Contacting Friends	5	8.2
9	102	Painting	5.67	8.1
10	109	Riding	6.33	8.0
11	103	Playing Games	7	7.9
12	104	Playing Computer Games	7.67	7.8
13	119	Taking Part in Debate	8.33	7.7
14	118	Taking Part in Quiz	9	7.6
15	122	Watching Cinema	9.66	7.6

4.17 Final List of the Least-Liked Non-Academic Interest

Sl. No.	Item No.	Non-Academic Interest	Percentage Score	Position
1	114	Solving Puzzles	19	6.7
2	105	Poetry	19.67	6.7
3	115	Swimming	20.33	6.6
4	108	Reading Novel	21	6.6
5	100	Making Soft toys	21.67	6.6
6	90	Dancing	22.33	6.5
7	117	Talking long walks	23	6.4

Sl. No.	Item No.	Non-Academic Interest	Percentage Score	Position
8	85	Clay Modeling	23.67	6.4
9	95	Gossiping	24.33	6.4
10	110	Remaining idle	25	6.3
11	99	Modeling	25.67	6.3
12	124	Writing Letters	26.33	6.3
13	113	Smoking	27	6.2
14	112	Shopping	27.67	6.2
15	93	Fortune Telling	28.33	6.1

4.18 Final List of the Best-liked Activities Interest

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
1	147	Teaching Children	0.17	9.8
2	148	Teaching Adult	0.5	9.6
3	140	Organizing Play	0.83	9.4
4	172	To sell ticket for your school show	1.17	9.2
5	131	Giving 'fist aid'	1.5	9.1
6	129	Decorating your room with flowers	1.83	8.9
7	187	To be placed making arrangement for school sports or concerts	2.17	8.8
8	157	To study the air rules of the world	2.5	8.7
9	155	To draw attractive designs for cover pages of books or magazines	2.83	8.7
10	175	To make attractive design and posters for advertising	3.17	8.6
11	145	Raising money for charity	3.5	8.5

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
12	187	To know how sound is record on gramophone record	3.83	8.4
13	132	Handling horse	4.17	8.3
14	174	To draw cartoons or humorous sketches of persons or animals	4.5	8.3
15	127	Contributing to charities	4.83	8.2
16	161	To become an officer in ship	5.17	8.1
17	135	Living in a city	5.5	8.1
18	193	Take part in debates	5.83	8.1
19	142	Raising flowers and vegetables	6.17	8.0
20	151	To belong to army, navy or air force when there is no war	6.5	8.0
21	179	To write articles for school paper or a local news paper	6.83	7.9
22	160	To organize a club or society and plan some work for every for every one	7.17	7.8
23	158	To make models airplanes, ship, motor car etc.	7.5	7.8
24	168	To drive a railway engine	7.83	7.8
25	182	To see an operation being performed by a surgeon	8.17	7.7
26	207	To visit sick persons in hospital	8.5	7.7
27	130	Entertaining others	8.83	7.7
28	138	Meeting and directing people	9.17	7.6
29	208	Writing personal letters	9.5	7.6
30	167	To make and write stories of your own	9.83	7.6

4.19 Final List of the Least-liked Activities Interest

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
1	165	To make leather goods bags etc.	18.17	6.8
2	153	To put small parts together as in a clock, radio, lock sewing machine etc.	18.5	6.8
3	150	To draw plans for public buildings house or grounds	18.83	6.8
4	126	Bargaining	19.17	6.7
5	192	To know all about coal, iron and other metals and their manufacture	19.5	6.7
6	166	To keep a systematic account of money spent and received.	19.83	6.7
7	186	To experience with chemicals combining different materials to see the effect	20.17	6.6
8	169	To enquire about the price of articles in the market	20.5	6.6
9	144	Regulars hours for works	20.83	6.6
10	203	To know the details on atom bomb or hydrogen bomb	21.17	6.6
11	190	To rewrite sentences until they express just want to say	21.5	6.6
12	181	To make a radio-set at home	21.83	6.6
13	176	To answer telephone calls, give the information or massages to others	22.17	6.5
14	170	To do fine engraving or carving work on wood mental etc.	22.5	6.5
15	152	To repair motor cars or others machines	22.83	6.5

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
16	204	To help others to settle their quarrels word by word	23.17	6.4
17	191	To estimate the value of building, motor cars, plots of land etc.	23.5	6.4
18	185	To make articles of wood like table, chairs, boxes etc.	23.83	6.4
19	128	Drilling solders	24.17	6.4
20	205	To knit socks, vests etc.	24.5	6.4
21	137	Methodical work	24.83	6.4
22	159	To make rope, laces etc. or small machine	25.17	6.4
23	188	To feed, water and take care of cows, bullocks and horses	25.5	6.3
24	202	To know how soap and oil, cream etc. are manufactured	25.83	6.3
25	183	To go on doing the some thing mechanically for a long time	26.17	6.3
26	143	Repairing clocks	26.5	6.3
27	136	Looking at a field, windows	26.83	6.2
28	198	To know how mental desires or mental troubles are caused	27.17	6.2
29	194	To use saw, hammer, nails etc. to repair articles	27.5	6.2
30	133	Interviewing prospectus in selling	27.83	6.2

4.20 Final List of the Best-Liked Vocational Interest

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	280	Railway	0.17	9.8
2	283	School, Teacher	0.5	9.6
3	275	Professor	0.83	9.4
4	218	Bank Manager	1.17	9.2
5	229	Doctor	1.5	9.1
6	236	Engineer	1.83	9.0
7	281	Scientist	2.17	8.8
8	265	Pilot	2.5	8.8
9	214	Air Force	2.83	8.7
10	250	Journalist	3.17	8.6
11	238	Fashion Designer	3.5	8.5
12	245	IAS Officer	3.83	8.4
13	246	IPS Officer	4.17	8.3
14	291	WBSC	4.5	8.3
15	249	Judge	4.83	8.2
16	224	CBI/CID	5.17	8.1
17	282	Singer	5.5	8.1
18	225	Cartoonist	5.83	8.1
19	263	Navy	6.17	8.0
20	276	Police	6.5	8.0
21	248	Income Tax Officer	6.83	7.9
22	258	Music Director	7.17	7.8
23	242	Geological Survey	7.5	7.8
24	218	Business Farm Manager	7.83	7.8
25	273	Private Tutor	8.17	7.7

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
26	268	Primary School Teacher	8.5	7.7
27	267	Player	8.83	7.7
28	210	Artist	9.17	7.6
29	256	Lawyer	9.5	7.6
30	212	Army Officer	9.83	7.6

4.21 : Final List of the Least–Liked Vocational Interest

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	257	Musician	18.08	6.8
2	239	Film Actor	19.17	6.7
3	279	Radio-Actor	19.5	6.7
4	240	Food-Supply	19.83	6.7
5	251	Jewelry	20.17	6.6
6	230	DVC	20.5	6.6
7	259	Model	20.83	6.6
8	266	Poet	21.17	6.6
9	254	Librarian	21.5	6.6
10	222	Business Man	21.83	6.5
11	261	Medical Representative	22.17	6.5
12	290	Veterinary-Surgeon	22.5	6.5
13	232	Dairy Technology	22.83	6.5
14	270	Publisher	23.17	6.4
15	231	Durgapur Steel Plant	23.5	6.4
16	278	Port – Trust	23.83	6.4
17	288	Tours and Travel Manager	24.17	6.4

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
18	234	Draft Man	24.5	6.4
19	294	Whole Dealer	24.83	6.4
20	252	Jewelry Designer	25.17	6.3
21	287	Telephone Operator	25.5	6.3
22	260	Medical Transcriptor	25.83	6.3
23	221	Broker	26.17	6.3
24	255	Leather Worker	26.5	6.3
25	274	Painter	26.83	6.2
26	241	Farmer	27.17	6.2
27	293	Wood Carver	27.5	6.2
28	284	Sales Man	27.83	6.2
29	233	Dairy Man	28.17	6.1
30	235	Driver	28.5	6.1

4.22 Tools No-2 – Nature of Study

The study is basically survey type of Research. Different interest variables are used for collecting data for interpreting the nature of different variables and their relations with Teaching-Learning System and Academic Achievement.

One variable is used as independent variable and another as dependent variable.

Multiple Interest is used as Independent variable and Academic Achievement is used as dependent variable and questionnaire is taken from standardized condition constructed by Dr. D Bhattacharyya and others.

4.23 Sampling for the Study

Various techniques have been devised for obtained sampling which will be representative of its population. The adequacy of a sample (i.e. its lack of bias) will depend upon our knowledge of the population or supply as well as upon the method used in drawing the sample . Here the nature of sampling is purposive type.

4.24 Population

The population of this study is on the students of class XI of different districts in West Bengal.

Administration of the Test :

The test has been administered under normal conditions in familiar classrooms of the students during school hours. Written directions have been given in Questionnaire in Bengali language. They have specifically assured that their answers will be kept confidential.

In each question there are five options of which one is to be selected.

Strongly agree	Agree	Undecided	Disagree	Strongly disagree
5	4	3	2	1

Likert's five point scale has been used for data collection and for other measurements.

After administration of the test different multiple interest variables are arranged in order for further calculation -

Multiple Interest	**Total Question**	**Score in Each Question**	**Maximum Score**
1. Academic	70	5	350
2. Non-academic	30	5	150
	Total = 100		Total = 500

Reliability Co-efficient of Multiple Interest (N = 50) :

Multiple Interest	Reliability Co-efficient (r)
1. Academic Interest	0.735
2. Non-Academic Interest	0.628

Therefore, by administration test and re-test method it is evident that the score is highly reliable and significant.

4.25 Validity of the Test

Validity is that quality of a data gathering instrument or procedure that enables it to determine what it designed to determine.

Our of different types of validity, content validity is estimated by evaluating the relevance of the test items, individually and as a whole. Each item should be sampling of the knowledge a performance which the test purpose to measure.

A highly reliable test must be valid. In the present study different validity index of iron academic variables are given below :

Multiple Interest	Validity Index
1. Academic Interest	0.85
2. Non-Academic Interest	0.79

4.26 Assessment of Multiple Interest Variables

The questionnaire presented for data collection has been standardized in the usual way and finally 100 items have been selected our of 118 items.

For standardization of each item 't' values has been administered by making two groups consisting of high and low group.

Total questionnaire has been divided in two basic categories. One is related to Multiple Interest variables consisting of 100 items and for academic variables consisting of 70 items and for non-academic variables another 30 items have been selected.

The 't' test for item analysis has been presented below –

4.27 Multiple Interest Variables Item Analysis

Item No.	High Group (N = 60)		Low Group (N = 60)		't' values
	Mean	SD	Mean	SD	
1.	4.6	1.53	3.95	1.3	2.93
2.	4.8	1.60	4.3	1.43	3.14
3.	3.7	1.23	2.9	0.96	4.19
4.	4.7	1.56	4.08	1.36	2.83
5.	4.5	1.50	4.05	1.35	2.98
6.	5.0	1.60	4.31	1.43	3.30
7.	3.4	1.13	2.92	0.97	2.38
8.	4.0	1.33	3.46	1.15	2.86
9.	3.5	1.16	3.00	1.00	2.92
10.	4.85	1.6	4.32	1.44	2.96
11.	4.6	1.53	4.05	1.35	2.87
12.	4.09	1.36	3.82	1.27	0.96*
13.	4.00	1.33	3.69	1.23	1.62*
14.	4.75	1.58	4.41	1.47	1.72*
15.	4.4	1.46	3.91	1.30	2.70
16.	4.9	1.63	4.18	1.39	3.80
17.	3.52	1.17	2.95	0.98	2.98
18.	3.85	1.28	3.18	1.06	3.37
19.	4.11	1.37	3.92	1.30	0.88*
20.	4.45	1.48	4.18	1.39	5.88
21.	4.58	1.52	3.9	1.30	3.75
22.	4.08	1.36	3.32	1.10	3.82
23.	3.9	1.30	3.46	1.15	2.42
24.	4.11	1.37	3.92	1.30	1.03*

Item No.	High Group (N = 60)		Low Group (N = 60)		't' values
	Mean	SD	Mean	SD	
25.	3.65	1.21	3.05	1.01	3.31
26.	3.98	1.32	3.21	1.07	5.05
27	3.30	1.10	2.78	0.92	3.68
28.	4.92	1.64	4.42	1.47	2.79
29.	4.12	1.37	3.41	1.13	3.92
30.	4.76	1.58	4.16	1.38	3.19
31.	4.65	1.55	4.05	1.35	2.83
32.	4.67	1.58	4.16	1.38	1.88*
33.	3.45	1.15	3.12	1.04	1.81*
34.	3.75	1.25	3.32	1.10	3.60
35.	4.01	1.33	3.76	1.25	1.21*
36.	4.85	1.61	4.32	1.44	2.54
37.	3.42	1.14	2.9	0.96	3.23
38.	3.98	1.32	3.41	1.13	3.37
39.	3.69	1.23	3.05	1.01	3.74
40.	3.92	1.30	3.34	1.11	2.65
41.	3.66	1.22	3.46	1.15	1.15
42.	4.32	1.44	3.81	1.27	2.85
43.	4.15	1.38	3.48	1.16	3.02
44.	4.82	1.60	4.18	1.39	4.28
45.	3.46	1.15	3.02	1.00	2.18
46.	4.81	1.60	4.34	1.44	4.2
47.	4.58	1.52	4.02	1.34	3.48
48.	4.12	1.37	3.41	1.13	3.57
49.	3.67	1.22	3.06	1.02	3.78
50.	4.41	1.47	3.76	1.25	3.84

Item No.	High Group (N = 60)		Low Group (N = 60)		't' values
	Mean	SD	Mean	SD	
51.	3.85	1.28	3.18	1.06	3.17
52.	4.86	1.62	3.91	1.30	4.54
53.	3.92	1.30	3.42	1.14	2.36
54.	4.86	1.62	4.39	1.46	2.95
55.	4.38	1.46	3.92	1.30	2.28
56.	4.09	1.36	3.42	1.14	3.74
57.	3.70	1.23	3.48	1.16	1.02*
58.	4.90	1.63	4.72	1.57	0.92*
59.	4.68	1.56	4.47	1.49	1.38*
60.	4.07	1.35	3.38	1.12	3.65
61.	4.42	1.47	3.92	1.30	2.61
62.	4.95	1.65	4.34	1.44	3.83
63.	4.22	1.40	3.52	1.17	3.86
64.	4.58	1.52	4.08	1.36	2.79
65.	3.73	1.24	3.58	1.19	0.73*
66.	4.56	1.52	3.98	1.32	4.16
67.	4.05	1.35	3.56	1.18	3.24
68.	4.41	1.47	4.14	1.38	1.52*
69.	4.48	1.49	3.92	1.30	2.78
70.	4.09	1.36	3.41	1.13	3.25
71.	3.58	1.19	2.92	0.97	3.64
72.	4.46	1.48	3.92	1.30	2.86
73.	4.13	1.37	3.41	1.13	4.48
74.	4.79	1.59	4.48	1.49	1.74*
75.	4.42	1.47	3.92	1.30	2.75
76.	4.88	1.62	4.64	1.54	1.11*

Item No.	High Group (N = 60)		Low Group (N = 60)		't' values
	Mean	SD	Mean	SD	
77.	4.63	1.84	4.02	1.34	2.75
78.	4.81	1.60	4.34	1.44	4.20
79.	4.0	1.33	3.35	1.11	2.68
80.	4.86	1.62	4.09	1.36	3.52
81.	4.08	1.36	3.58	1.19	2.61
82.	3.98	1.32	3.41	1.13	3.18
83.	3.59	1.19	2.92	0.97	5.13
84.	3.97	1.32	3.444	1.14	2.42
85.	3.68	1.22	3.02	1.00	2.73
86.	4.16	1.38	3.86	1.28	1.17*
87.	3.82	1.27	3.06	1.02	3.59
88.	4.49	1.49	3.81	1.27	4.55
89.	4.38	1.46	3.91	1.30	2.74
90.	4.87	1.62	4.43	1.47	2.48
91	3.69	1.23	3.47	1.15	0.89*
92.	4.08	1.36	3.46	1.15	3.12
93.	3.70	1.23	3.48	1.16	1.44*
94.	4.81	1.60	4.11	1.37	3.2
95.	4.35	1.45	3.62	1.20	2.78
96.	4.49	1.49	3.81	1.27	3.11
97.	4.57	1.52	3.68	1.22	3.40
98.	4.86	1.62	4.42	1.47	3.38
99.	4.03	1.34	3.9	1.3	0.66
100.	4.95	1.65	4.32	1.44	3.52
101.	4.46	1.48	3.78	1.26	3.38
102.	4.92	1.64	4.33	1.44	2.82

Item No.	High Group (N = 60)		Low Group (N = 60)		't' values
	Mean	SD	Mean	SD	
103.	3.67	1.22	3.0	1.00	2.77
104.	4.02	1.34	3.32	1.10	3.06
105.	4.48	1.49	3.91	1.30	2.83
106.	4.9	1.63	4.32	1.44	2.72
107.	4.67	1.55	3.94	1.31	4.48
108.	4.06	1.35	3.48	1.16	3.64
109.	4.63	1.54	4.02	1.34	2.75
110.	4.09	1.36	3.41	1.13	3.11
111.	3.7	1.23	3.02	1.00	3.55
112.	4.82	1.60	4.32	1.44	3.52
113.	4.52	1.50	4.02	1.34	2.92
114.	4.82	1.60	4.3	1.43	3.48
115.	4.49	1.49	3.93	1.31	3.98
116.	4.82	1.60	4.32	1.44	4.39
117.	4.68	1.56	3.90	1.3	4.56
118.	3.99	1.33	3.42	1.14	3.37

Out of 118 questions, finally 100 questions have been selected through Item Analysis.

4.28 Construction of a Questionnaire on Academic, Non-Academic and Vocational Interest of the Higher Secondary Students

The researcher first made a through survey of the literature dealing with academic, non-academic and vocational interests of the higher secondary students. Thus he could obtain a source from which items of the questionnaire can be selected under each head, namely academic, non-academic, and vocational. Initially, there was a list of 100 different academic subjects prepared

by a researcher. The list contains academic subjects like Agriculture, Biology Geography, and Mathematics etc. A group of higher secondary students (N = 1000 were asked to identify 85 such items secondary students the researcher got a list of 81 items. For the purpose of farming a questionnaire dimension, academic subjects, she desired to introduce 3 types of response categories. There were like (L), Indifferent (I) and Dislike (D).

In the same way the researcher asked the 100 higher secondary students to eliminate those non-academic subject matters in which they had no interest at all. It was thus found that 100 students were able to identify 43 non-academic subjects and items of information about which they were concerned from a list 60 items. The researcher was thus able to construct the non-academic questionnaire response categories L, I. D as indicated in the cases of academic interest.

Likewise, the researcher prepared a list of activity interests covering a wide range of interest activities of higher secondary students. The number of items activity interest initially was 125. The higher secondary students were asked to identify those activity interests in which they were least concerned. The majority, about 85% of the students indicated 84 such items in which they were least concerned. So the activity interest were finally prepared 84 items.

Further, a list of 100 different vocational prepared by the researcher. The list contains vocations like artist, lecturer, judge, telephone operator etc. A group of higher secondary students (N = 100) were asked to identify 100 such items which all of them preferred to accept. Considering the responses of 100 such higher secondary students the researcher got a list 86 items. For the purpose of farming a questionnaire on the dimension, vocation, she desired to introduce 3 types of response categories, L. I. and D.

Researcher was thus able to give a final shape to final draft of the questionnaire. The following are the steps for preparing the different checklist.

Step-1 : Identification of all possible interests in different fields of the best liked and the least liked of Higher Secondary Students from available sources.

Step-2 : Arranging the interest of the students randomly in 8 respective lists.

Step-3 : Administration of the lists on a large sample of student of class XI and XII (with boys and girls) who would be asked to check of the lists the best liked and the least liked interests of students according to their choice.

Step-4 : Counting of the checks on each item and expressing the total number of checks of each item as a percentage of maximum possible checks which was equal to the number of items in the sample.

Step-5 : Ranking on the interests of the each list according to the percentage of check of them.

Step-6 : In academic subject selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

In non-academic subject selecting the first 15 best-like and last 15 least like (according to mars) of interest of the student.

In activities selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

In vocation selecting the first 30 best-like and last 30 least like (according to mars) of interest of the student.

Step-7 : Preparation of the final check list.

Step-8 : Determining the reliability of the list.

Step-9 : Determining the validity of the list.

(a) Identification of specific interest under each of the dimension, academic, non-academic and vocational :

The investigator thought that the students themselves were the best sources for obtaining the interests in different fields of the best-liked and the least liked students.

The investigator also identified some sources from which interests of students in different fields could be collected. These were as follows :

i) New Education in India.

ii) The Encyclopedia of Education.

iii) Secondary Education Commission — Technical and Vocational Education.

iv) Kothari Commission - Vocational, Technical, and Engineering Education.

v) Some works on Vocational, Academic, Recreational Education.

(b) Arrangement of the interests pattern of higher secondary students through randomization :

The interests in different fields of the students identified for each checklist were then given serial number 1-194. The serial numbers were one by one selected by lottery method as the fist statement, second statement and so on, In this way the four preliminary form of the checklist were obtained. These four checklists were as follows :

i. Preliminary list of the academic subject interests of the students.

ii. Preliminary list of the non-academic interests of the students.

iii. Preliminary list of the activities interests of the students.

iv. Preliminary list of the vocational interests of the students.

(c) Administration of the questionnaire on a sample of higher secondary students for classifying items under two categories – best-liked and least-liked :

The School students were the best judges of their interests in different fields. Therefore, the investigation prepared two checklist, one for the best-liked

and other for the least-liked interests of the students. Academic subjects list containing 81 items, non-academic list containing 43 items, activities list containing 84 items and vocational list containing 43 items, activities list containing 84 items and vocational list containing 86 items and administered them on a man dimly selected students population of boys and girls of class XI and XII in four schools.

(d) Counting the number of items and expressing the total number of checks of each items as a percentage of maximum possible checks :

The investigator countered the checks of the interests and converted the total number of check to each interest to percentage of the total number of students. There were about two hundred and twenty seven Students both urban–rural and boys–girls. There fore a interest that was checked 'say' by one hundred fifty students was given the percentage seventy five.

(e) Determining the rank on the interest of each list according to the percentage of check on them :

The interests were them ranked according to their percentage of checks in academic subjects the first 30 items of the highest ranking or best-liked interests and the last 30 items of the lowest ranking least-liked interests of the students were made into a list in rank order and list was named the highest ranking or best-liked academic subjects interests of the students and the other list was named the highest ranking least liked school subjects interests of the students.

In non-academic interests list the first 15 items of the highest ranking or best-liked and the last 15 items of the highest ranking or least-liked interests of the students were made into list in rank order and the list was named the highest ranking best liked non-academic interests of the students and the other list was named the highest ranking least liked amusement interests of the students.

In activities list the first 30 items of the highest ranking of best liked and

the last 30 items of the lowest ranking or least liked interests of the students were made into a list in rank order and the list was named the highest ranking best-liked activities interests of the students and the other list was named highest ranking least liked activities interests of the students.

In vocation the first 30 items of the highest ranking or best interests and the last 30 items of the lowest ranking or least-liked interests of the students were made into a list in rank order and the list was named the higher ranking best-liked vocational interests of the students and the other list was the highest ranking least-liked vocational interests of the students.

CHAPTER – V

METHODOLOGY

CHAPTER – V
METHODOLOGY

5.1 Methodology

Descriptive survey is the methodology of this investigation. Interest is a personality variable and human beings have a variety of interest which is the cause of the different activities in which men and women are found to the occupied. For the present investigation, the researcher has selected three areas of interest e.g. academic, non-academic and vocational interest. A survey has been planned to locate the spread of these three types of interest in the sample selected. An attempt has also been made to discriminate the particular interest in two categories – best-liked and least-liked by assigning marks to the individuals forming this sample.

5.2 Population

The population of the study are the pupils of higher secondary schools classes XI and XII under West Bengal Council of Higher Secondary Education who belongs to the urban and rural areas of West Bengal, Bengali as the medium of instruction.

5.3 Sampling

The researcher prepared a list of higher secondary for both boys and girls which were willing to co-operate with the researcher for the collection of data, that is, the measurement of the interest pattern. From a list of thirty such urban and rural schools, the researcher selected two co-educational schools, one each from the urban area and rural area and also one 'boys' and 'girls' school in the township. Due to shortage of time, it was not possible for the researcher to include other schools for forming comparatively large sample. The distribution of the subjects in the present study is shown in the table.

The samples selected belonging to the urban and rural areas from west

Bengal. The urban locations represent urban population with modern facilities. The modern facilities are not available in the rural area. The samples, therefore, were of uniform socio-economic background and were having different kind of exposure to life style. The samples,, thus have adequately represented the urban and rural population of higher secondary students in West Bengal.

5.4 Tools

The researcher used the following tools in performing the following survey work. A questionnaire on the academic, non-academic and vocational interests of the higher secondary students have been prepared. As has already been stated, the researcher himself has prepared a questionnaire on academic, non-academic and vocational interests covering the content domain of interest which was made suitable with the intellectual maturity of higher secondary students.

5.5 Procedure

The procedural aspect of the present investigation was concerned with the administration of the questionnaire. In each school, the researcher visited class XI pm a day period to the commencement of the administration of the questionnaire for the purpose of establishing report with the students. During this time, researcher made it clear that responding to the questionnaire could not in any way be related with their normal study in school. They were therefore, advised respond to the items of the questionnaire in an open mind. But the most important part of the procedure was to give the tests clear instruction regarding the way of responding to the items. The researcher then distributed the printed sheet of the questionnaire to each pupil in the class. He was particular about the total time taken by the testes to complete the questionnaire. A very and happy and congenial atmosphere prevailed in the classroom during the administration of the questionnaire. The procedure described above has been followed in exactly the same sequence in other schools.

Application of Tool No-2

It is known that in descriptive survey the researcher collected evidence on the basis of same hypothesis or theory and similarly also tabulate and summarize the data carefully in an attempt to draw meaningful generalization that will lead to the findings of the investigations.

When trying to solve problems like measurement of interest, researchers often conduct surveys. They collect details descriptions of existing phenomena with the intent of employing the data to justify current conditions and practices or to make more intelligent plans for improving it. Surveys may be descriptive and specify the properties of educational phenomena. For example, the phenomena of determining interests in three useful areas academic, non-academic and vocational interests.

5.6 Descriptive Statistics

The researcher administered the interests questionnaire on the sample, details of which have been under the heading 'Procedure'. It shows the different measures of descriptive statistics.

Table – 5.1 : Mean and S.D. of Interest Questionnaire

School				Activity			
Academic		Non-academic		Interest		Vocational	
X	SD	X	SD	X	SD	X	SD
10.3	2.86	11.26	4.56	4.04	1.62	4.62	1.38
9.78	2.60	12.2	4.2	4.02	1.64	4.6	1.52
6.68	2.00	10.49	3	9.82	2.9	7.6	1.7
7.6	1.70	5.18	2.32	7.78	1.54	7.2	2.1

An examination of result in Table-5.1 shows that the means and S.Ds as obtained on the final administration was in keeping with the values obtained during an earlier administration (N = 50). Hence, the questionnaire has internal consistency.

5.7 Analysis of Data

Table – 5.2 : Showing Data for 't-test' between Best-liked and Least-liked Academic Subjects

	Best	Least
Mean	8.33	6.54
S.D.	0.61	0.28
Observation	30	30
Correlation by Rank Difference	0.99	
Hypothesized Mean Difference	0	
Df	29	
t-test		4.71

Table – 5.3 : Showing Data for 't-test' between Best-liked and Least-liked Non-Academic Interest

	Best	Least
Mean	8.33	6.42
S.D.	0.61	0.18
Observation	15	15
Correlation by Rank Difference	0.99	
Hypothesized Mean Difference	0	
Df		14
t-test		11.29

Table – 5.4 : Showing Data for 't-test' between Best-liked and Least-liked Activities Interests

	Best	Least
Mean	8.08	6.48
S.D.	0.62	0.19
Observation	30	30
Correlation by Rank Difference	0.98	
Hypothesized Mean Difference	0	
Df		29
t-test		12.31

Table – 5.5 : Showing Data for 't-test' between Best-liked and Least-liked Vocational interests

	Best	Least
Mean	8.34	6.43
S.D.	0.66	0.20
Observation	30	30
Correlation by Rank Difference	0.99	
Hypothesized Mean Difference	0	
Df		29
t-test		14.69

5.8 Interpretation of the Result

Inferential Statistics

The part deals with the analysis and interpretation by means of inferential statistics (t-test) by taking into account the scores of criterion measure, i.e. academic interest, non-academic interest, activity interest and vocational interest as obtained under the respective groups under consideration.

The scores of best-liked and least-liked groups of vocational interest were

first subjected to t-test.

Testing of H_1 :

In order to test hypothesis H_1, t-test was applied to test the significance of the difference between means of higher secondary students belonging to urban and rural area of the sample, on the criterion of vocational interest. The data for testing H_1 has been given in Table – 5.6.

Table – 5.6 : t-value of Higher Secondary Students of Urban and Rural Area of Nadia District on the criterion of Vocational Interest

Groups	N	Mean	SD	Mean Difference	SE_D	df	t
Urban	175	11.49	0.23	7.72	1.32	226	2.31
Rural	52	3.77	0.10				

Interpretation : The result stated in Table–5.6 shows that higher secondary students of urban area differs significantly from those of rural areas on the criterion of vocational interest ($t = 10.85$, $P < 0.01$). Thus the hypothesis H_1 is retained. The higher secondary students of urban area have conceived more vocational interest than those of rural area.

Testing of H_2 :

In order to test hypothesis H_2, t-test was applied to the test significance of the difference between means of higher secondary boys and girls, on the criterion of vocational interest. The data for testing H_2 has been given in Table – 5.7.

Table – 5.7 : t-value of Higher Secondary Boys and Girls of Nadia District on the Criterion of Vocational Interest

Groups	N	Mean	SD	Mean Difference	SE_D	df	t
Boys	65	9.19	0.40	3.17	0.62	112	5.11
Girls	48	6.02	0.30				

Interpretation : The result stated in Table–5.7 shows that higher secondary boys differs significantly from the girls on the criterion of vocational interest ($t = 5.11$, $P < 0.01$). Thus the hypothesis H_2 is retained. The higher secondary boys have conceived more vocational interest than those of the girls.

Testing of H_3 :

In order to test hypothesis H_3, t-test was applied to test the significance of the difference between means of higher secondary students belonging to co-educational schools of urban and rural area, on the criterion of vocational interest. The data for testing H_3 has been given in Table – 5.8.

Table – 5.8 : t-value of Higher Secondary Students of the Co-educational Schools of Rural and Urban Area of Nadia District on the criterion of Vocational Interest

Groups	N	Mean	SD	Mean Difference	SE_D	df	t
Urban	62	5.36	0.14	1.67	0.36	113	4.89
Rural	52	3.60	0.08				

Interpretation : The result stated in Table–5.8 shows that there is a significantly difference between higher secondary students belonging to co-educational schools, on the criterion of vocational interest ($t = 4.89$, $P < 0.01$). Thus the hypothesis H_3 is retained. The higher secondary students belonging to the co-educational schools of urban area have conceived more vocational interest than those of rural area in Nadia district.

Testing of H_4 :

In order to test hypothesis H_4, t-test was applied to test the significance of the difference between the best-liked vocational interests of higher secondary students. The data for testing H_4 has been given in Table – 5.9.

Table – 5.9 : t-value of Best-liked Vocational Interest of the Higher Secondary Students

Groups	N	Mean	SD	Mean Difference	SE_D	df	t
Urban	30	8.34.	0.60	1.91	0.13	59	14.69
Rural	30	6.43	0.26				

Interpretation : The result stated in Table–5.9 shows that there is a significance difference between groups who conceived best-liked interest and groups who conceived least-liked interest on the criterion of vocational interest ($t = 14.69$, $P < 0.01$). Thus the hypothesis H_4 is accepted. The best-liked interest of the higher secondary students differs significantly from the least-liked interests.

Testing of H_5 :

The rank difference co-efficient of correlation was calculated between the vocational interest scores of the best-liked group and the least-liked group and the value of correlation co-efficient r was found to be equal to 0.997 which was found to be significant beyond 0.01 level of significance ($r = 0.997$, $df = 58$, $P < 0.01$).

In view of the fact that the above analysis and interpretation took much time for systematic presentation, the researcher very humbly expressed her limitation for not going into details of the analysis pertaining to academic, non-academic and activity interest. The data showing the value and its level of significance was well as the r value and corresponding level of significance has been shown in Table 5.2, 5.3, 5.4 respectively. Hence, researcher states the major findings only in respect of vocational interest.

5.9 Hypotheses

H_1 : The boys and the girls will not differ in interest in Bengali.

H_2 : The urban students and the rural students are not differ in interest in Bengali.

H_3 : The boys and the girls will not differ in interest in Mathematics.

H_4 : The urban students and the rural students are not differ in interest in Mathematics.

H_5 : The boys and girls will not differ in interest in English.

H_6 : The urban students and the rural students are not differ in interest in English.

H_7 : The boys and the girls will not differ in interest in History.

H_8 : The urban students and the rural students are not differ in interest in History.

H_9 : The boys and girls will not differ in interest in Geography.

H_{10} : The urban students and the rural students are not differ in interest in Geography.

H_{11} : The boys and the girls will not differ in interest in Physical Science.

H_{12} : The urban students and the rural students are not differ in interest in Physical science.

H_{13} : The boys and the girls will not differ in interest in Life Science.

H_{14} : The urban students and the rural students are not differ in interest in Life Science.

H_{15} : The boys will possess greater non-academic interest than the girls.

H_{16} : The urban students will possess greater non-academic interest than the rural students.

H_{17} : The academic achievement of the student will depend on academic interests positively.

H_{18} : The academic achievement of the students will depend on non-academic interests of the students.

5.10 Organisation of Data

Frequency Distribution :

The scores obtained by the students in multiple interests have been grouped into frequency distribution for each dimension identified by the researcher. The distributions of each dimension for the scores of the students have been stated below in the following tables :

A. Distribution for the Scores in the Interest in Bengali

Scores	'f'	Measures
47-48	1	
45-46	15	
43-44	13	
41-42	24	
39-40	37	
37-38	15	M = 36.85
35-36	21	Mdn = 37.40
33-34	27	SD = 5.20
31-32	18	
29-30	13	
27-28	3	
25-26	13	
Total Students	**200**	

B. Distribution for the Scores in the Interest in Mathematics

Scores	'f'	Measures
50 – 53	1	
46 – 49	18	
42 – 45	24	
38 – 41	21	
34 – 37	43	M = 34.63
30 – 33	58	Mdn = 34.90
26 – 29	25	SD = 6.70
22 – 25	7	
18 – 21	2	
14 – 17	1	
Total Students	**200**	

C. Distribution for the Scores in the Interest in English

Scores	'f'	Measures
48 – 50	5	
45 – 47	10	
42 – 44	16	
39 – 41	26	
36 – 38	37	
33 – 35	28	M = 34.63
30 – 32	38	Mdn = 34.90
27 – 29	13	SD = 6.70
24 – 26	16	
21 – 23	8	
18 – 20	2	
15 – 17	1	
Total Students	**200**	

D. Distribution for the Scores in the Interest in History

Scores	'f'	Measures
49 – 51	8	
46 – 48	21	
43 – 45	33	
40 – 44	29	
37 – 39	33	
34 – 36	33	M = 38.00
31 – 33	10	Mdn = 38.70
28 – 30	13	SD = 6.90
25 – 27	8	
22 – 24	8	
19 – 21	3	
16 – 18	0	
13 – 15	1	
Total Students	**200**	

E. Distribution for the Scores in the Interest in Geography

Scores	'f'	Measures
46 – 48	12	
43 – 45	40	
40 – 42	23	
37 – 39	32	M = 37.40
34 – 36	42	Mdn = 37.20
31 – 33	26	SD = 5.80
28 – 30	16	
25 – 27	6	
22 – 24	3	
Total Students	**200**	

F. Distribution for the Scores in the Interest in Physical Science

Scores	'f'	Measures
48 – 50	5	
45 – 47	22	
42 – 44	15	
39 – 41	28	
36 – 38	32	M = 37.75
33 – 35	35	Mdn = 35.68
30 – 32	22	SD = 6.7
27 – 29	22	
24 – 26	14	
21 – 23	4	
18 – 20	1	
Total Students	**200**	

G. Distribution for the Scores in the Interest in Life Science

Scores	'f'	Measures
48 – 50	6	
45 – 47	14	
42 – 44	43	
39 – 41	39	
36 – 38	35	M = 37.95
33 – 35	29	Mdn = 38.65
30 – 32	17	SD = 5.91
27 – 29	10	
24 – 26	2	
21 – 23	3	
18 – 20	2	
Total Students	**200**	

H. Distribution for the Scores in the Interest in Multiple Interests

Scores	'f'	Measures
312 – 323	7	
300 – 311	11	
288 – 299	4	
276 – 287	24	
264 – 275	45	
252 – 263	25	M = 255.10
240 – 251	25	Mdn = 259.10
228 – 239	18	SD = 29.90
216 – 227	15	
204 – 215	14	
192 – 203	10	
180 – 191	2	
Total Students	**200**	

I. Distribution for the Scores in the Interest in Non-academic Interests

Scores	'f'	Measures
142 – 148	1	
135 – 141	1	
128 – 134	21	
121 – 127	40	
114 – 120	44	M = 112.20
107 – 113	27	Mdn = 114.60
100 – 106	27	SD = 13.76
93 – 99	26	
86 – 92	6	
72 – 78	1	
65 – 71	2	
Total Students	**200**	

Table – 5.10 : Gender-wise and Strata-wise Scores of the Students in Academic Interest

	Boys				Girls			
Urban	271	242	274	262	267	218	252	252
	271	264	312	282	244	260	255	202
	253	312	271	234	273	297	285	254
	231	264	227	243	240	230	214	210
	258	280	237	300	250	244	277	265
Rural	265	273	210	206	240	259	214	219
	281	212	230	245	202	302	261	267
	269	243	269	222	276	267	272	262
	308	233	302	262	299	213	281	269
	243	266	253	271	208	209	264	271

Table – 5.11 : ANOVA for the Scores in Academic Interest for testing Hypotheses

Sources	Df	Ss	Variance	F
Gender	1	1029.36	1029.36	1.33*
Strata	1	223.11	223.11	0.29*
Gender × Strata	1	946.69	946.69	1.23*
Within Ss	76	58968.90	776.14	
Total	**79**	**61186.06**		

*Not significant at 0.05 level.

Table – 12 : Gender-wise and Strata-wise Scores of the Students in Non-Academic Interest

	Boys				Girls			
Urban	115	121	126	119	121	188	114	123
	119	115	134	124	110	134	112	108
	108	127	113	111	124	125	119	132
	107	108	104	184	101	112	190	104
	107	127	127	112	105	117	133	109
Rural	101	105	196	197	102	113	144	177
	101	195	104	131	185	121	115	118
	136	198	114	105	123	111	113	121
	119	105	118	129	168	184	131	106
	115	19	130	193	103	125	128	125

Table – 5.13 : ANOVA for the Scores in Academic Interest for testing Hypotheses

Sources	Df	Ss	Variance	F
Gender	1	583.20	583.20	0.68*
Strata	1	4651.25	4651.25	5.6**
Gender × Strata	1	1496.45	1496.45	1.8*
Within Ss	76	64599.30	849.99	
Total	**79**	**71330.20**		

**Not significant at 0.05 level.

Table – 5.14 : Norm for the Scores in Academic Interest

Scores	(1)	(2)	(3)	(4)	(5)
	f	Cum f	Cum f of step (2) - ½ f of step (1)	Col. in (3)	T-score %
312 – 323	7	200	196.50	98.25	71
300 – 311	11	193	187.50	93.75	65
288 – 299	4	182	180.00	90.00	63
276 – 287	24	178	166.00	83.00	60
264 – 275	45	154	131.50	65.73	54
252 – 263	25	109	96.50	48.25	49
240 – 251	25	84	71.50	35.75	46
228 – 239	18	59	50.00	25.00	43
216 – 227	15	41	33.50	16.75	40
204 – 215	14	26	19.00	9.50	37
192 – 203	10	12	7.00	3.50	32
180 – 191	2	2	1.00	0.50	24
	N = 200				

Table – 5.15 : Norm for the Scores in Non-Academic Interest

Scores	(1)	(2)	(3)	(4)	(5)
	f	Cum f	Cum f of step (2) - ½ f of step (1)	Col. in (3)	T-score %
142 – 148	1	200	199.5	99.75	78
135 – 141	1	199	198.5	99.25	74
128 – 134	21	198	187.5	93.75	65
121 – 127	40	177	157.5	78.50	58
114 – 120	44	137	115.0	57.50	52
107 – 113	27	93	79.5	37.75	47
100 – 106	27	66	52.5	26.25	44
93 – 99	26	39	26.0	13.00	39
86 – 92	4	13	11.0	5.50	34
79 – 85	6	9	6.0	3.00	31
72 – 78	1	3	2.5	1.25	28
65 – 71	2	2	1.0	0.50	24
	N = 200				

Fig. 1 : Scatter Diagram showing the Correlation between the Scores in Academic Interests and Academic Achievement of the Students

Scores	Academic Achievement Scores						
	350-399	400-499	450-499	500-549	500-599	600-649	Total
300 – 314					1	3	4
285 – 299				5	3	3	11
270 – 284				3	3		6
255 – 269			3	1			4
240 – 254			1	1			2
255 – 239		2	2	1			5
210 – 224	3	2	3				8
195 – 209	1	3	2				6
180 – 194	1	3					4
Total f	5	10	11	11	7	6	50

r = 0.34 (significant at the 0.05 level)

Fig. 2 : Scatter Diagram showing the Correlation between the Scores in Academic Interests and Academic Achievement of the Students

Scores	Academic Achievement Scores						
	350-399	400-499	450-499	500-549	500-599	600-649	Total
144 – 157		1		2	1	1	5
130 – 143	2	1	1	6	2	2	14
116 – 129	1	2	5	1	2	2	13
102 – 115	1	6	3	1	1		12
88 – 101			1	1		1	3
74 – 87			1		1		2
60 – 73	1						1
Total f	5	10	11	11	7	6	50

r = 0.009 (Not significant at the 0.05 level)

5.11 Findings

H_1 : The boys and the girls do not differ in interest in Bengali. The Hypothesis No. 1 is retained.

H_2 : The urban students and the rural students do not differ in interest in Bengali. The Hypothesis No. 2 is retained.

H_3 : The boys and the girls do not differ in interest in Mathematics. The Hypothesis No. 3 is retained.

H_4 : The urban students and the rural students do not differ in interest in Mathematics. The Hypothesis No. 4 is retained.

H_5 : The boys and the girls do not differ in interest in English. The Hypothesis No.5 is retained.

H_6 : The urban students and the rural students do not differ in interest in English. The Hypothesis No. 6 is retained.

H_7 : The boys and the girls do not differ in interest in History. The Hypothesis No. 7 is retained.

H_8 : The urban students and the rural students do not differ in interest in History. The Hypothesis No. 8 is retained.

H_9 : The boys and the girls do no differ in interest in geography. The Hypothesis No. 9 is retained.

H_{10} : The urban students and the rural students do not differ in interest in geography. The Hypothesis No. 10 is retained.

H_{11} : The boys and the girls do not differ in interest in physical science. The Hypothesis Null is retained.

H_{12} : The urban students and the rural students do not differ in interest in Physical Science. The Hypothesis No. 12 is retained.

H_{13}. : The boys and the girls do not differ in interest in life science. The Hypothesis No. 13 is retained.

H_{14} : The urban students and the rural students do not differ in interest in life science. The Hypothesis No. 14 is retained.

H_{15} : The boys and the girls do not differ in Non-Academic interest. The Hypothesis No. 15 is rejected.

H_{16} : The urban students possess less interest in Non-academic interest than rural students. The Hypothesis No. 16 is rejected.

H_{17} : The academic achievement (aggregate scores) of the students is positively correlated with the academic interest of the students. The Hypothesis No. 17 is retained.

H_{18} : The academic achievement (aggregate scores) of the student is not significantly correlated with the non-academic interest of the students. So the Hypothesis No. 18 is rejected.

CHAPTER – VI

SUMMARY AND CONCLUSION

CHAPTER – VI

SUMMARY AND CONCLUSION

6.1 Non-Academic Variables and Teaching Learning System

Non-academic factors also matter, especially as they relate to academic activities, non-academic factors can influence academic performance, but cannot substitute for it. Relevant nonacademic factors can be classified into three groups.

1. Individual psychosocial factors. such as Interest ,motivation (e.g., academic self-discipline, commitment to school) and self-regulation (e.g., emotional control, academic self-confidence) though the present study considered only interest as a psychological variables.
2. Family factors, such as attitude toward education, involvement in students' school activities, and family influence.
3. Vocational planning that identifies a good fit between students' interests and their activity.

Educators, students and their families, and society at large can make effective use of nonacademic student information to support student academic performance. Educators should :

- Monitor relevant nonacademic student behaviors, based on such indicators as absenteeism and missed homework assignments, and use this information to identify students who may be in academic trouble
- Intervene to encourage students to re-engage with their academic work.
- Promote postsecondary goals through rigorous coursework and effective vocational & career planning.

Students and their families should:

- Seek help to focus on academic work and improve academically supportive behaviors

- Seek information and support on activities that prepare students for postsecondary educational including financing, career decision-making, and relevant work and school experiences.

Society at large should :

Place the highest priority on academic achievement and signal clearly to students and families that academic achievement is essential to the economic well-being of every individual, each state, and the country as a whole

Success in education means fulfilling academic requirements. There are no shortcuts to academic success. We should all be focused on helping our students become academically prepared, primarily through direct academic interventions, and secondarily through cultivation of the nonacademic factors that support academic achievement.

Multiple interests basically stands for multi-dimensional approach of interest related to teaching and learning where one stimulus would be associated differently reinforced by nonacademic factors. In teaching-learning system actually one stimulus is connected with different responses, as a result some connection is fruitful, some other is partly related and rest after responses are isolated with the man stimulus. In this perspective teaching and learning is very much challenging as it needs special strategy for the betterment of the students as a whole.

In a classroom situation a teacher can apply a particular strategy but it will influence students not in the same fashion. Now the question is what would be our learning style so that we can perform better in a classroom. Our answer is diversification i.e. we can enhance the students possibility according to their interest either academically if not non academically so that we can identify their interest pattern and multiple them to a particular strategy and convert the multiple response to a modified response where diversification is the ultimate reality.

That is how multiple stimulus and response relation could be exposed through the students multiple response which would be the source for finding different stimulus resulting modified response in a teaching-learning system.

6.2 Classification of Multiple Interests

1. Academic Interest
2. Non-academic Interest

6.3 Assumption of the Study

1. The basic objectives of this study is that to study interest in the field of educational domain.
2. To study the interest as a very important educational tool for enhancing the academic betterment of the students.
3. The work will be immense helpful for the students of back benchers or who have lack of confidence of any particular subject, who are almost isolated from their educational sector and obviously for general category of students.
4. To develop a model for teaching and learning on the basis of interest of the students academically and non academically then diversify it according to the standard and situation of the students in different ways.

6.4 Significance of the Study

1. Non Academic interest is the special feature of interest category that could be applied in teaching-learning system.
2. Some students in anywhere mostly are out of the field of education because of their non academic interest that could be shifted academically through this model.
3. Inclusion of Non Academic Variables could be a philosophy through which it can be psychologised in multifarious dimension in different variables of psychology. Therefore it will be considered as one of the important functions that will have a close intimacy either with the affective domain of

education as well as it will encourage the cognitive factors too.

4. The work will be significant as it can be applied in individual learning as well as group learning too.

6.5 Objectives of the Study

- To study the different non academic variables at higher secondary schools of West Bengal.
- To construct a standardized Questionnaire regarding Non-Academic Activities.
- To study Teaching Learning System and how Non Academic Variables can be incorporated with the system.
- To study the Teaching Learning process of higher secondary level schools of West Bengal.
- To study the different interests including academic, nonacademic, vocational and other activities for inclusion of Non Academic variables.

6.6 Statement of the Problem

"Inclusion of Non Academic Variables in Teaching Learning System".

6.7 Methodology

Type of Research :

The research is basically descriptive type survey research. Both descriptive and inferential statistics have been used for conducting the study.

Tools Used :

1. Interest Inventory regarding Nonacademic Activities.
2. Standardized Questionnaire regarding Multiple Interest of learners by Dr. D. Bhattacharyya.

Population :

Eleven grade students of West Bengal are considered as population.

Sample :

Both the questionnaire have been applied on 700 samples from 12 selected schools in parts of West Bengal.

6.8 Limitations

- There is no confusion about to inclusion of nonacademic variables in Teaching Learning System but it is not easy to include all the variables in a particular way. So the study is some areas of the particular field that does not demand to cover all the areas of non academic activities.
- The study is limited within the components of teaching learning system based on academic environment as well as nonacademic variables.
- The research is comprehensive in nature. Inclusion of non academic variables are shown within some dimensions inculcated from review of studies and the situational demands.

6.9 Findings

The following findings are found out

Findings – 1 :

1) The boys and the girls do not differ in interest in Bengali. The Hypothesis No. 1 is retained.
2) The urban students and the rural students do not differ in interest in Bengali. The Hypothesis No. 2 is retained.
3) The boys and the girls do not differ in interest in Mathematics. The Hypothesis No. 3 is retained.
4) The urban students and the rural students do not differ in interest in Mathematics. The Hypothesis No. 4 is retained.
5) The boys and girls do not differ in interest in English. The Hypothesis

No. 5 is retained.

6) The urban students and the rural students do not differ interest in English. The Hypothesis No. 6 is retained.
7) The boys and the girls do not differ in interest in History. The Hypothesis No. 7 is retained.
8) The urban students and the rural students do not differ in interest in History. The Hypothesis No. 8 is retained.
9) The boys and the girls do not differ in interest in geography. The Hypothesis No. 9 is retained.
10) The urban students and the rural students do not differ in interest in geography. The Hypothesis No. 10 is retained.
11) The boys and the girls do not differ in interest in physical science. The Hypothesis Null is retained.
12) The urban students and the rural students do not differ in interest in Physical Science. The Hypothesis No. 12 is retained.
13) The boys and the girls do not differ in interest in life science. The Hypothesis No. 13 is retained.
14) The urban students and the rural students do not differ in interest in life science. The Hypothesis No. 14 is retained.
15) The boys and the girls do not differ in Non-Academic interest. The Hypothesis No. 15 is rejected.
16) The urban students possess less interest in Non-academic interest than rural students. The Hypothesis No.16 is rejected.
17) The academic achievement (aggregate scores) of the students is positively correlated with the academic interest of the students. The Hypothesis No. 17 is retained.
18) The academic achievement (aggregate scores) of the student is not significantly correlated with the non-academic interest of the students. So the Hypothesis No. 18 is rejected.

Findings–2

i) Higher secondary students of Urban area differ significantly from those of rural area on the criteria of vocational interest. The higher secondary students of Urban area have conceived more vocational interest than those of Rural area.

ii) The higher secondary boys differs significantly from the girls of Nadia district on the criterion of vocational interest. The higher secondary boys of Nadia district have conceived more vocational interest than those of the girls.

iii) There is a significant between higher secondary students belonging to co-educational schools of Urban and Rural on the criterion of vocational interest. The higher secondary students belonging to the co-educational schools of Urban area have conceived more vocational interest than those of rural area .There is a significant difference between groups who conceived best-liked interest groups who conceived least-liked interest on the criterion of vocational interest. The best-liked interest of higher secondary students differs significantly from the least-liked interests.

iv) The rank difference co-efficient of correlation between the vocational interest scores of the best-liked group and the least-liked group was found to be significant beyond 0.01 level of significance ($r = 0.997$, $df = 58$, $p < 0.01$)

From the above study it can be interpreted

(a) In school environment :

i) Class atmosphere giving high control and cow punishment to the children's scored high or creativity test.

ii) High intellectual and cultural activities giving better performances or tend to be associated with high creativity.

iii) No significant difference could be noticed in case of other school

environment factors.

(b) In home environment :

i) High intellectual and cultural activities giving better performances or tend to be associated with high creativity.

ii) High economic aspect component will get high score or creativity.

iii) No significant difference could be noticed in case of other home environmental factors.

Findings – 3 :

Application of Tools No-1

List 6.1: Ranking of the Best-liked of the Academic Subjects and Professional Courses Higher Secondary Students

Sl. No.	Item No.	Academic Subject	Rank
1	21	Computer Engineer	1
2	37	Geography	2
3	43	Hotel Management	3
4	17	Computer Science	4
5	12	Biology	5
6	15	M. B. A.	6
7	60	M. C. A	7
8	54	Music	8
9	24	Doctor	9
10	27	English	10
11	48	Journalism	11
12	35	Fashion Designing	12
13	53	Mathematics	13
14	14	Bio-Technology	14
15	4	Automobile Engineering	15

Sl. No.	Item No.	Academic Subject	Rank
16	57	Micro Biology	16
17	77	Software Engineering	17
18	68	Painting	18
19	5	Architect Engineering	19
20	15	B. B. A.	20
21	1	Agriculture	21
22	28	Education	22
23	31	Electronic Engineering	23
24	45	Information Technology	24
25	59	Mechanical Engineering	25
26	66	Psychology	26
27	80	Work Education	27
28	75	Sanskrit	28
29	65	Physics	29
30	9	Archaeology	30

List 6.2 : Ranking of the least-liked of the Academic Subjects and Professional Courses Higher Secondary Students

Sl. No.	Item No.	Academic Subject	Rank
1	70	Political Science	52
2	13	Botany	53
3	42	Home Science	54
4	19	Chemistry	55
5	10	Anatomy	56
6	67	Philosophy	57
7	71	Polytechnique Engineering	58
8	20	Comparative Literature	59

Sl. No.	Item No.	Academic Subject	Rank
9	32	Foreign Engineering	60
10	51	Library Science	61
11	11	B. C. A.	62
12	62	Nautical Science	63
13	78	Textile Designing	64
14	44	Indian Language	65
15	50	Logic	66
16	6	Accountancy	67
17	2	Anthropology	68
18	34	Food Technology	69
19	79	Veterinary Science	70
20	63	Oceanology	71
21	74	Statistics	72
22	81	Zoology	73
23	29	Economics	74
24	18	Commerce	75
25	8	Astrology	76
26	25	Dairy Technology	77
27	30	Ecology	78
28	69	Plastic Technology	79
29	52	Leather Technology	80
30	26	Economic Geography	81

List 6.3: Ranking of the Best-liked Non-Academic Interests of the Higher Secondary Students

Sl. No.	Item No.	Non-Academic Subject	Rank
1	121	Visiting Zoo	1
2	101	Observing Nature	2
3	120	Visiting Places	3
4	107	Reading News Paper	4
5	98	Listening to F. M. Radio	5
6	123	Watching T. V.	6
7	111	Singing	7
8	86	Contacting Friends	8
9	102	Painting	9
10	109	Riding	10
11	103	Playing Games	11
12	104	Playing Computer Games	12
13	119	Taking Part in Debate	13
14	118	Taking Part in Quiz	14
15	122	Watching Cinema	15

List 6.4 : Ranking of the Least-liked Non-Academic Interests of the Higher Secondary Students

Sl. No.	Item No.	Non-Academic Subject	Rank
1	114	Solving Puzzles	29
2	105	Poetry	30
3	115	Swimming	31
4	108	Reading Novel	32
5	100	Making Soft toys	33
6	90	Dancing	34

Sl. No.	Item No.	Non-Academic Subject	Rank
7	117	Talking long walks	35
8	85	Clay Modeling	36
9	95	Gossiping	37
10	110	Remaining Idle	38
11	99	Modeling	39
12	124	Writing Letters	40
13	113	Smoking	41
14	112	Shopping	42
15	93	Fortune Telling	43

List 6.5 : Ranking of the Best-liked Activities Interests of the Higher Secondary Students

Sl. No.	Item No.	Activities Interests	Rank
1	147	Teaching Children	52
2	148	Teaching Adult	53
3	140	Organizing Play	54
4	172	To sell ticket for a lottery or for you're your school show	55
5	131	Giving 'fist aid'	56
6	129	Decorating your room with flowers	57
7	187	To be placed making arrangement for school sports or concerts	58
8	157	To study the air rules of the world	59
9	155	To draw attractive designs for cover pages of books or magazines	60
10	175	To make attractive design and posters for advertising	61

Sl. No.	Item No.	Activities Interests	Rank
11	145	Raising money for charity	62
12	187	To know how sound is record on gramophone record	63
13	132	Handling horses	64
14	174	To draw cartoons or humorous sketches of persons or animals	65
15	127	Contributing to Charities	66
16	161	To become an officer on ship	67
17	135	Living in a city	68
18	193	Take part in debates	69
19	142	Raising flowers and vegetables	70
20	151	To belong to army, navy or air force when there is no war	71
21	179	To write articles for school paper or a local news paper	72
22	160	To organize a club or society and plan some work for every for every one	73
23	158	To make models airplanes, ship, motor car etc.	74
24	168	To drive a railway engine	75
25	182	To see an operation being performed by a surgeon	76
26	207	To visit sick persons in hospital	77
27	130	Entertaining others	78
28	138	Meeting and directing people	79
29	208	Writing personal letters	80
30	167	To make and write stories of your own	81

List 6.6 : Ranking of the Least-liked Activities Interests of the Higher Secondary Students

Sl. No.	Item No.	Activities Interests	Rank
1	165	To make leather goods bags etc.	55
2	153	To put small parts together as in a clock, radio, lock sewing machine etc	56
3	150	To draw plans for public buildings house or grounds	57
4	126	Bargaining	58
5	192	To know all about coal, iron and other metals and their manufacture	59
6	166	To keep a systematic account of money spent and received	60
7	186	To experience with chemicals combining different materials to see the effect	61
8	169	To enquire about the price of articles in the market	62
9	144	Regulars hours for works	63
10	203	To know the details on atom bomb or hydrogen bomb.	64
11	190	To rewrite sentences until they express just want to say	65
12	181	To make a radio – set at home	66
13	176	To answer telephone calls, give the information or massages to others	67
14	170	To do fine engraving or carving work on wood mental etc.	68
15	152	To repair motor cars or others machines	69

Sl. No.	Item No.	Activities Interests	Rank
16	204	To help others to settle their quarrels world by word	70
17	191	To estimate the value of buildings, motor cars, plots of land etc.	71
18	185	To make articles of wood like table, chairs, boxes etc.	72
19	128	Drilling Solders	73
20	205	To knit socks, vests etc.	74
21	137	Methodical Work	75
22	159	To make rope, laces etc. or small machine	76
23	188	To feed, water and take care of cows, bullocks and horses	77
24	202	To know how soap and oil, cream etc. are manufactured	78
25	183	To go on doing the some thing mechanically for a long time	79
26	143	Repairing clocks	80
27	136	Looking at a field, windows	81
28	198	To know how mental desires or mental troubles are caused	82
29	194	To use saw, human, nails etc to repair articles	83
30	133	Interviewing prospectus in selling	84

List 6.7 : Ranking of the Best-liked Vocational Interest of the Higher Secondary Students

Sl. No.	Item No.	Vocational Interests	Rank
1	280	Railway	1
2	283	School Teacher	2
3	275	Professor	3
4	218	Bank Manager	4
5	229	Doctor	5
6	236	Engineer	6
7	281	Scientist	7
8	265	Pilot	8
9	214	Air Force	9
10	250	Journalist	10
11	238	Fashion Designer	11
12	245	IAS Officer	12
13	246	IPS Officer	13
14	291	WBCS	14
15	249	Judge	15
16	224	CBI / CID	16
17	282	Singer	17
18	225	Cartoonist	18
19	263	Navy	19
20	276	Police	20
21	248	Income Tax Officer	21
22	258	Music Director	22
23	242	Geological Survey	23
24	218	Business Farm Manager	24
25	273	Private Tutor	25

Sl. No.	Item No.	Vocational Interests	Rank
26	268	Primary School Teacher	26
27	267	Player	27
28	210	Artist	28
29	256	Lawyer	29
30	212	Army Officer	30

List 6.8 : Ranking of the Least-liked Vocational Interests of the Higher Secondary Students

Sl. No.	Item No.	Vocational Interests	Rank
1	257	Musician	57
2	239	Film Actor	58
3	279	Radio-Actor	59
4	240	Food-Supply	60
5	251	Jewelry	61
6	230	DVC	62
7	259	Model	63
8	266	Poet	64
9	254	Librarian	65
10	222	Business Man	66
11	261	Medical Representative	67
12	290	Veterinary – Surgeon	68
13	232	Dairy Technology	69
14	270	Publisher	70
15	231	Durgapur Steel Plant	71
16	278	Port-Trust	72
17	288	Tours and Travel Manager	73
18	234	Draft Man	74

Sl. No.	Item No.	Vocational Interests	Rank
19	294	Whole Dealer	75
20	252	Jewelry Designer	76
21	287	Telephone Operator	77
22	260	Medical Transcriptor	78
23	221	Broker	79
24	255	Leather Worker	80
25	274	Painter	81
26	241	Farmer	82
27	293	Wood Carver	83
28	284	Sales Man	84
29	233	Dairy Man	85
30	235	Driver	86

6.10 Preparation of the Final Checklist

In order to finalize the checklist, the investigator transmitted rank order to items on each list scores from the percentage position. These were by means of table provided by H. E. Garrett.

At first the mark order of an item was converted into percentage position by means of the formulae.

In which R was the rank of the items of the checklist and N was the number of items ranked. From this percentage position the score of the item on a scale of 10 points were read from the table 49 provided by H.E. Garrett. Since the Normal probability curve contains a maximum number of 100 cases, consideration of percentage position on a scale of 100 would yield cases, more than 100. And hence, a scale of 10 points is considered. So, in all these cases, percentage position = 100 X (R – 0.5) /N where R = Rank of the items in the checklist and N = No. of items checked in reference to educational statistics by Garrett.

List 6.9 : Final List of the Best-Liked Academic Subjects

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	21	Computer Engineer	0.17	9.9
2	37	Geography	0.5	9.5
3	43	Hotel Management	0.83	9.4
4	17	Computer Science	1.17	9.2
5	12	Biology	1.5	9.1
6	15	M. B. A.	1.83	8.9
7	60	M. C. A	2.17	8.8
8	54	Music	2.5	8.7
9	24	Doctor	2.83	8.7
10	27	English	3.17	8.6
11	48	Journalism	3.5	8.5
12	35	Fashion Designing	3.83	8.4
13	53	Mathematics	4.17	8.3
14	14	Bio-Technology	4.5	8.3
15	4	Automobile Engineering	4.83	8.2
16	57	Micro Biology	5.17	8.1
17	77	Software Engineering	5.5	8.1
18	68	Painting	5.83	8.1
19	5	Architect Engineering	6.17	8.0
20	15	B. B. A	6.5	8.0
21	1	Agriculture	6.83	7.9
22	28	Education	7.17	7.8
23	31	Electronic Engineering	7.5	7.8
24	45	Information Technology	7.83	7.8
25	59	Mechanical Engineering	8.17	7.7
26	66	Psychology	8.5	7.7

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
27	80	Work Education	8.83	7.7
28	75	Sanskrit	9.17	7.6
29	65	Physics	9.5	7.6
30	9	Archaeology	9.83	7.6

List 6.10 : Final List of the Least-Liked Academic Subjects

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	70	Political Science	17.17	6.9
2	13	Botany	17.5	6.9
3	42	Home Science	17.83	6.9
4	19	Chemistry	18.17	6.8
5	10	Anatomy	18.5	6.8
6	67	Philosophy	18.83	6.8
7	71	Polytechnique Engineering	19.17	6.7
8	20	Comparative Literature	19.5	6.7
9	32	Foreign Engineering	19.83	6.7
10	51	Library Science	20.17	6.6
11	11	B. C. A.	20.5	6.6
12	62	Nautical Science	20.83	6.6
13	78	Textile Designing	21.17	6.6
14	44	Indian Language	21.5	6.6
15	50	Logic	21.83	6.6
16	6	Accountancy	22.17	6.5
17	2	Food Technology	22.5	6.5
18	34	Veterinary Science	22.83	6.5
19	79	Oceanology	23.17	6.4
20	63	Statistics	23.5	6.4

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
21	74	Zoology	23.83	6.4
22	81	Economics	24.17	6.4
23	29	Commerce	24.5	6.4
24	18	Astrology	24.83	6.4
25	8	Dairy Technology	25.17	6.3
26	25	Ecology	25.5	6.3
27	30	Plastic Technology	25.83	6.3
28	69	Leather Technology	26.17	6.3
29	52	Economic Geography	26.5	6.2
30	26	Anthropology	26.83	6.2

List 6.11 : Final List of the Best-Liked Non-Academic Interest

Sl. No.	Item No.	Non-Academic Interest	Percentage Score	Position
1	121	Visiting Zoo	0.33	9.7
2	101	Observing Nature	1	9.2
3	120	Visiting Places	1.67	9.0
4	107	Reading News Paper	2.33	8.8
5	98	Listening to F. M. Radio	3	8.6
6	123	Watching T.V.	3.67	8.5
7	111	Singing	4.33	8.3
8	86	Contacting Friends	5	8.2
9	102	Painting	5.67	8.1
10	109	Riding	6.33	8.0
11	103	Playing Games	7	7.9
12	104	Playing Computer Games	7.67	7.8
13	119	Taking Part in Debate	8.33	7.7
14	118	Taking Part in Quiz	9	7.6
15	122	Watching Cinema	9.66	7.6

List 6.12 : Final List of the Least-Liked Non-Academic Interest

Sl. No.	Item No.	Non-Academic Interest	Percentage Score	Position
1	114	Solving Puzzles	19	6.7
2	105	Poetry	19.67	6.7
3	115	Swimming	20.33	6.6
4	108	Reading Novel	21	6.6
5	100	Making Soft toys	21.67	6.6
6	90	Dancing	22.33	6.5
7	117	Talking long walks	23	6.4
8	85	Clay Modeling	23.67	6.4
9	95	Gossiping	24.33	6.4
10	110	Remaining idle	25	6.3
11	99	Modeling	25.67	6.3
12	124	Writing Letters	26.33	6.3
13	113	Smoking	27	6.2
14	112	Shopping	27.67	6.2
15	93	Fortune Telling	28.33	6.1

List 6.13 : Final List of the Best-liked Activities Interest

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
1	147	Teaching Children	0.17	9.8
2	148	Teaching Adult	0.5	9.6
3	140	Organizing Play	0.83	9.4
4	172	To sell ticket for your school show	1.17	9.2
5	131	Giving 'fist aid'	1.5	9.1
6	129	Decorating your room with flowers	1.83	8.9
7	187	To be placed making arrangement for	2.17	8.8

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
		school sports or concerts		
8	157	To study the air rules of the world	2.5	8.7
9	155	To draw attractive designs for cover pages of books or magazines	2.83	8.7
10	175	To make attractive design and posters for advertising	3.17	8.6
11	145	Raising money for charity	3.5	8.5
12	187	To know how sound is record on gramophone record	3.83	8.4
13	132	Handling horse	4.17	8.3
14	174	To draw cartoons or humorous sketches of persons or animals	4.5	8.3
15	127	Contributing to charities	4.83	8.2
16	161	To become an officer in ship	5.17	8.1
17	135	Living in a city	5.5	8.1
18	193	Take part in debates	5.83	8.1
19	142	Raising flowers and vegetables	6.17	8.0
20	151	To belong to army, navy or air force when there is no war	6.5	8.0
21	179	To write articles for school paper or a local news paper	6.83	7.9
22	160	To organize a club or society and plan some work for every for every one	7.17	7.8
23	158	To make models airplanes, ship, motor car etc.	7.5	7.8
24	168	To drive a railway engine	7.83	7.8

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
25	182	To see an operation being performed by a surgeon	8.17	7.7
26	207	To visit sick persons in hospital	8.5	7.7
27	130	Entertaining others	8.83	7.7
28	138	Meeting and directing people	9.17	7.6
29	208	Writing personal letters	9.5	7.6
30	167	To make and write stories of your own	9.83	7.6

List 6.14 : Final List of the Least-liked Activities Interest

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
1	165	To make leather goods bags etc.	18.17	6.8
2	153	To put small parts together as in a clock, radio, lock sewing machine etc.	18.5	6.8
3	150	To draw plans for public buildings house or grounds	18.83	6.8
4	126	Bargaining	19.17	6.7
5	192	To know all about coal, iron and other metals and their manufacture	19.5	6.7
6	166	To keep a systematic account of money spent and received.	19.83	6.7
7	186	To experience with chemicals combining different materials to see the effect	20.17	6.6
8	169	To enquire about the price of articles in the market	20.5	6.6
9	144	Regulars hours for works	20.83	6.6

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
10	203	To know the details on atom bomb or hydrogen bomb	21.17	6.6
11	190	To rewrite sentences until they express just want to say	21.5	6.6
12	181	To make a radio-set at home	21.83	6.6
13	176	To answer telephone calls, give the information or massages to others	22.17	6.5
14	170	To do fine engraving or carving work on wood mental etc.	22.5	6.5
15	152	To repair motor cars or others machines	22.83	6.5
16	204	To help others to settle their quarrels word by word	23.17	6.4
17	191	To estimate the value of building, motor cars, plots of land etc.	23.5	6.4
18	185	To make articles of wood like table, chairs, boxes etc.	23.83	6.4
19	128	Drilling solders	24.17	6.4
20	205	To knit socks, vests etc.	24.5	6.4
21	137	Methodical work	24.83	6.4
22	159	To make rope, laces etc. or small machine	25.17	6.4
23	188	To feed, water and take care of cows, bullocks and horses	25.5	6.3
24	202	To know how soap and oil, cream etc. are manufactured	25.83	6.3

Sl. No.	Item No.	Activities Interest	Percentage Score	Position
25	183	To go on doing the some thing mechanically for a long time	26.17	6.3
26	143	Repairing clocks	26.5	6.3
27	136	Looking at a field, windows	26.83	6.2
28	198	To know how mental desires or mental troubles are caused	27.17	6.2
29	194	To use saw, hammer, nails etc. to repair articles	27.5	6.2
30	133	Interviewing prospectus in selling	27.83	6.2

List 6.15: Final List of the Best-Liked Vocational Interest

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	280	Railway	0.17	9.8
2	283	School, Teacher	0.5	9.6
3	275	Professor	0.83	9.4
4	218	Bank Manager	1.17	9.2
5	229	Doctor	1.5	9.1
6	236	Engineer	1.83	9.0
7	281	Scientist	2.17	8.8
8	265	Pilot	2.5	8.8
9	214	Air Force	2.83	8.7
10	250	Journalist	3.17	8.6
11	238	Fashion Designer	3.5	8.5
12	245	IAS Officer	3.83	8.4
13	246	IPS Officer	4.17	8.3

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
14	291	WBSC	4.5	8.3
15	249	Judge	4.83	8.2
16	224	CBI/CID	5.17	8.1
17	282	Singer	5.5	8.1
18	225	Cartoonist	5.83	8.1
19	263	Navy	6.17	8.0
20	276	Police	6.5	8.0
21	248	Income Tax Officer	6.83	7.9
22	258	Music Director	7.17	7.8
23	242	Geological Survey	7.5	7.8
24	218	Business Farm Manager	7.83	7.8
25	273	Private Tutor	8.17	7.7
26	268	Primary School Teacher	8.5	7.7
27	267	Player	8.83	7.7
28	210	Artist	9.17	7.6
29	256	Lawyer	9.5	7.6
30	212	Army Officer	9.83	7.6

List 6.16 : Final List of the Least-Liked Vocational Interest

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
1	257	Musician	18.08	6.8
2	239	Film Actor	19.17	6.7
3	279	Radio-Actor	19.5	6.7
4	240	Food-Supply	19.83	6.7
5	251	Jewelry	20.17	6.6

Sl. No.	Item No.	Academic Subject	Percentage Score	Position
6	230	DVC	20.5	6.6
7	259	Model	20.83	6.6
8	266	Poet	21.17	6.6
9	254	Librarian	21.5	6.6
10	222	Business Man	21.83	6.5
11	261	Medical Representative	22.17	6.5
12	290	Veterinary-Surgeon	22.5	6.5
13	232	Dairy Technology	22.83	6.5
14	270	Publisher	23.17	6.4
15	231	Durgapur Steel Plant	23.5	6.4
16	278	Port – Trust	23.83	6.4
17	288	Tours and Travel Manager	24.17	6.4
18	234	Draft Man	24.5	6.4
19	294	Whole Dealer	24.83	6.4
20	252	Jewelry Designer	25.17	6.3
21	287	Telephone Operator	25.5	6.3
22	260	Medical Transcriptor	25.83	6.3
23	221	Broker	26.17	6.3
24	255	Leather Worker	26.5	6.3
25	274	Painter	26.83	6.2
26	241	Farmer	27.17	6.2
27	293	Wood Carver	27.5	6.2
28	284	Sales Man	27.83	6.2
29	233	Dairy Man	28.17	6.1
30	235	Driver	28.5	6.1

6.11 Relevance of the Study for improving Teaching Learning

In each of the fields – Academic, Non-academic, Activities and Vocational interests, the investigator had selected the best-liked items as well as the least-liked items. More over by using the checklists the administrator of a particular school could find the interests and disinterest of their students. Hence the curriculum of the higher secondary education planned in a more scientific basic. So that the needs and interests of the students could be met with. The higher secondary school should not be a single track institution. They should cater for the needs and interests of the students. The same could be set for the recreational programmes to be planned by the higher secondary schools. Thus the questionnaire could be quite relevant and useful for the administrator of the higher secondary schools would be capable of planning the curriculum more judiciously.

The questionnaire could also be used for selection of students for particular academic subjects, vocational courses and recreational activities. This is because it is an expended fact that students interested in a particular subject or areas or vocation or recreation is quite natural, so they strive for them.

Actually multiple interest demands vast of activities students but the time compelled us to limit ourselves to evaluate a limited filled in multiple interests. We are trying to correlate non-academic activities and academic activities with multiple interests short type of test is applied.

Teaching-learning system specially included in our research for measuring relationship between teaching-learning system and multiple interest. Our suggestion is that these activities could be included in our teaching-learning system properly. But we are limited in mentioning all theories of teaching and learning rather to mention some of them which are specially significant.

6.12 Conclusion

It is apparent from the present study that the students possess diversified academic interest in different degrees. The academic interest is essential for the growth of academic career of the students. Actually interest in academic affairs motivated students read more and devote more time in studies. Learning does not become a burden to them interest in curricular activities concern them hence they read joyfully for the pursued of future education. The more the interest, the more will be learning.

Moreover, non-academic interests also play an important role in the field of academic affairs. The leisure time activities are based on non-academic activities. If the students devote their leisure time activities to these non-academic activities they get inspiration or academic activities, hence the non-academic activities influence to a great extent the academic activities of the students. One is the counter part of the other.

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APPENDICES

APPENDIX – I

TEACHING-LEARNING SYSTEM

References from different websites :

1. Teaching / Learning Method :

By a combination of visiting lectures, team teaching, individual presentation from both staff and students a collaborative learning pedagogy will be used.

www.id.swub.edu.au/honours.iho400/html/teach.htm

2. UMUC-Verizon Virtual Resource Site ....Module 1 : Teaching/.....

Teaching / Learning Activates..... Note : Links to institution – specific teaching/learning activities in the pages below open now browser windows...

www.umuc.edu/virtualteaching / module1 / strategies.html

3. OBGYN.Net The KTE Method for Teaching-learning Operative...

...The KTE Method for Teaching-Learning Operative Procedures by Fabio Fiorino, MD, OBGYN.net Editorial Advisor Developed in 1990 and published as in references 1...

www.obgyn.net/displayppt.asp?page/English/pubs/features/presentation-ns/fiorino1/fiorino1-ss

4. Catalyst Teaching: Address Diverse Learning Styles

... Language Learning Center – LLC assists UW faculty and TAs in the teaching, learning, and researching of languages and cultures.

Catalyst.washington.edu/method/learningstyles.htmlcached/

5. Teaching Methods / Subject Area Resources Links

.... Hot Links Academic learning Time Educational Psychology Interactive Academic Learning Time A Systems Model of the Teaching/ Learning Process Effective Teaching.....

www.mhhe.com/socscience/education/methods/resources.htmlcached

6. Teaching Resource Centre, University of Virginia

The Teaching Resources Centre (TRC), established in 1990, offers a number of services and resource materials designed to enhance the teaching abilities of... trc.
Virginia/cached /

7. Case Method Teaching-National Centre for Case Study Teaching in...

... Other Case Method Articles .... Case Studies : The Scientific poster as a Teaching tool by ... Case-stimulated Learning within Endocrine Physiology Lectures : An Approach...
Ublilb.buffalo.edu/libraries/projects/cases/teaching/teaching.tem

8. The Morgan-Potsdam Model for teaching / learning mathematics

The Morgan-Potsdam Model is the name give to a method of the teaching of mathematics developed by Dr. Clarence F. Stephens at Morgans State University and ....
www.math.buffal.edu/mad/special/morgnpostdam model.html

9. Teaching-Learning Centre : Learning Matters

Grube, Kari W. The Gurbe Method : The Art of Teaching and Learning Useful. Information by Designing and Plying a Simulation Game...Courses.
Durhamtech.edu/tlc/www/html/Resource/Volume_1/Gregory mcleod. htm

10. Teaching & Learning Method

TEACHING AND LEARNING METHOD. The emphasis is necessarily on LEARNING. In an intensive one year MBA programme there is a lot of ground.

www.2.wmin.ac.uk/muradj/MBAM30Teaching&LearningMethod.html

11. HEFCE : Learning & Teaching

We also fund several special initiatives to support learning and teaching. Our funding method funds similar activities at similar rates, and ensures that any...

www.hefce.ac.uk/learning/

12. UCD-Centre for Teaching and Learning-Good Practice in Student ...

... Choice of Assessment Method ... The assessment supports learning and does not undermine it; there ... the expected outcomes of the programme, the teaching methods, and ...

13. Oersibak Vest Systems

Offer a research based learning method for both children and adults.

www.spellingzone.com/cached | Australia > B2B Education Software > Spelling

14. Student Learning and the Myers-Briggs Type indicator

... We illustrate the ATA approach using discovery learning in teaching the central ... Using the discovery method, students hopefully will discover the reasons...www.gsu.edu/-dscghv/wwwmbti.html

15. Using digital resources for teaching, learning and research in ...

Using Digital resources in Teaching, Learning and Research in the Visual Arts ... A helical-scan recording method initially developed to record CD-quality sounds...

www.vads.ands.ac.uk/guides/using_guide/glossary.html

16. The Aesthetic Realism of Eli Siegel As Teaching Method

There is no more important news than the fact that in classrooms where teachers use the Aesthetic Realism Teaching Method, learning succeeds and students ....

There is no more important news than the fact that in classrooms where teachers use the Aesthetic Realism Teaching Method, learning succeeds and students ....

www.aestheticrealism.org/Educationlink.htm

17. Association for Promotion of Creative Learning, Patna : METHOD

... As unknown I limitless, there is no end to their curiosity. 2. Teaching Learning Method. 2.1. Develop the natural learning process...

www.creativelearningpatna.org/method.php.

18. Callan Method of Learning / Teaching / Teaching English

UK Learning Forums > Callan Method of Learning / Teaching English ... Callan Method of Learning/Teaching English (RE : Callan Method of Learning/Teaching English)

www.uk-learning.net/t6008/I.html

19. Learning & Teaching

Learning & Teaching within The Gwyddonic Order ...

www.gwyddoniad.org/teaching.html

20. The Penn State Teacher II

... LOWE; Commonly Asked Questions about Teaching with the Lecture Method; Learning from Lectures : Can It be Done ? – Jill Jeneen Fisher ...

www.psu.edu / celt / PST / pst.shtml

APPENDIX – II

INTEREST INVENTORY

No.	Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
1.	Agriculture	L	I	D
2.	Anthropology	L	I	D
3.	Astronomy	L	I	D
4.	Automobile Engineering	L	I	D
5.	Architect Engineering	L	I	D
6.	Accountancy	L	I	D
7.	Art & Craft	L	I	D
8.	Astrology	L	I	D
9.	Archaeology	L	I	D
10.	Anatomy	L	I	D
11.	B. C. A.	L	I	D
12.	Book Keeping	L	I	D
13.	Biology	L	I	D
14.	Botany	L	I	D
15.	Bio-Technology	L	I	D
16.	B. Pharma	L	I	D
17.	Business Management	L	I	D
18.	Commerce	L	I	D
19.	Chemistry	L	I	D
20.	Comparative Literature	L	I	D
21.	Comparative Engineering	L	I	D
22.	Clay Modeling	L	I	D
23.	Clinical Psychology	L	I	D
24.	Doctor	L	I	D

No.	Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
25.	Dairy Technology	L	I	D
26.	English	L	I	D
27.	Education	L	I	D
28.	Economics	L	I	D
29.	Ecology	L	I	D
30.	Electronic Engineering	L	I	D
31.	Foreign Engineering	L	I	D
32.	Fishery	L	I	D
33.	Food technology	L	I	D
34.	Fashion Designing	L	I	D
35.	Geology	L	I	D
36.	Geography, Geo-Physics	L	I	D
37.	Game Designing	L	I	D
38.	Hindi	L	I	D
39.	Horticulture	L	I	D
40.	History	L	I	D
41.	Home Science	L	I	D
42.	Hotel Management	L	I	D
43.	Indian Language	L	I	D
44.	Information Technology	L	I	D
45.	Insurance & Risk Management	L	I	D
46.	Interior Designing	L	I	D
47.	Journalism	L	I	D
48.	Linguistic	L	I	D
49.	Logic	L	I	D
50.	Library Science	L	I	D

No.	Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
51.	Leather Technology	L	I	D
52.	Mathematics	L	I	D
53.	Music	L	I	D
54.	M. B. A.	L	I	D
55.	Metal work	L	I	D
56.	Micro Biology	L	I	D
57.	Marine Engineering	L	I	D
58.	Mechanical Engineering	L	I	D
59.	M. B. B. S.	L	I	D
60.	Nautical Science	L	I	D
61.	Oceanology	L	I	D
62.	Optometry	L	I	D
63.	Physics	L	I	D
64.	Psychology	L	I	D
65.	Philosophy	L	I	D
66.	Painting	L	I	D
67.	Plastic Technology	L	I	D
68.	Political Science	L	I	D
69.	Polytechnique Engineering	L	I	D
70.	Radiology	L	I	D
71.	Sociology	L	I	D
72.	Statistic	L	I	D
73.	Sanskrit	L	I	D
74.	Civil Engineering	L	I	D
75.	Software Engineering	L	I	D
76.	Textile Designing	L	I	D

No.	Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
77.	Veterinary Science	L	I	D
78.	Work Education	L	I	D
79.	Wood Craft	L	I	D
80.	Zoology	L	I	D

If you have any other interest other than our check list, please mention it in the following space.

1.

2.

3.

4.

5.

No.	Non-Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
81.	Acting	L	I	D
82.	Boating	L	I	D
83.	Chat ling	L	I	D
84.	Collecting leaves	L	I	D
85.	Clay Modeling	L	I	D
86.	Contacting Friends	L	I	D
87.	Collecting Stamp	L	I	D
88.	Collecting Foreign Currency	L	I	D
89.	Dancing	L	I	D
90.	Excursions	L	I	D
91.	Fishing	L	I	D
92.	Fortune Telling	L	I	D
93.	Gardening	L	I	D
94.	Gossiping	L	I	D
95.	Internet surfing	L	I	D
96.	Jocose	L	I	D
97.	Listening to F. M. radio	L	I	D
98.	Modeling	L	I	D
99.	Making Soft toys	L	I	D
100.	Observing Nature	L	I	D
101.	Painting	L	I	D
102.	Playing games	L	I	D
103.	Playing Computer Games	L	I	D
104.	Poetry	L	I	D
105.	Photography	L	I	D
106.	Reading Newspaper	L	I	D

No.	Non-Academic Subjects	Linking (L)	Indifferent (I)	Disliking (D)
107.	Reading Novel	L	I	D
108.	Riding	L	I	D
109.	Remaining idle	L	I	D
110.	Singing	L	I	D
111.	Shopping	L	I	D
112.	Smoking	L	I	D
113.	Solving Puzzles	L	I	D
114.	Sending S. M. S.	L	I	D
115.	Taking long walks	L	I	D
116.	Taking part in quiz	L	I	D
117.	Taking part in competition	L	I	D
118.	Taking part in debate	L	I	D
119.	Visiting place	L	I	D
120.	Visiting Zoos	L	I	D
121.	Watching Cinema	L	I	D
122.	Watching T. V.	L	I	D
123.	Writing letters	L	I	D

If you have any other interest other than our check list, please mention it in the following space.

1.

2.

3.

4.

5.

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
124.	Arguing with Friends	L	I	D
125.	Bargaining	L	I	D
126.	Contributing to charities	L	I	D
127.	Drilling soldiers	L	I	D
128.	Decorating your room with flowers	L	I	D
129.	Entertaining others	L	I	D
130.	Giving "First Aid"	L	I	D
131.	Handling horses	L	I	D
132.	Interviewing prospectus in selling	L	I	D
133.	Interviewing men for a job	L	I	D
134.	Living in a city	L	I	D
135.	Looking at a shop windows	L	I	D
136.	Methodical works	L	I	D
137.	Meeting and directing people	L	I	D
138.	Making a speech	L	I	D
139.	Organizing a play	L	I	D
140.	Operating machinery	L	I	D
141.	Raising flowers and vegetables	L	I	D
142.	Repairing a clock	L	I	D
143.	Regular hours for work	L	I	D
144.	Raising money for charity	L	I	D
145.	Saving money	L	I	D
146.	Teaching children	L	I	D
147.	Teaching adult	L	I	D
148.	Taking responsibility	L	I	D

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
149.	To draw plans for public building, houses or gardens	L	I	D
150.	To belong to army, navy or air force when there is no war.	L	I	D
151.	To repair motor cars or other machines	L	I	D
152.	To put small parts together as in a clock, radio, lock sewing machines etc.	L	I	D
153.	To know how telegraph & wireless messages are conveyed.	L	I	D
154.	To draw attractive designs for cover pages of books or magazines	L	I	D
155.	To know how a film produced	L	I	D
156.	To study The air routes of The World.	L	I	D
157.	To make models of air phones, ships, motor cars, etc.	L	I	D
158.	To make ropes, laces, etc. or small	L	I	D
159.	To organize a club or society and plan some work for every work for every one.	L	I	D
160.	To become on officer on ship.	L	I	D
161.	To keep your books, papers, pencils, etc. in their proper places.	L	I	D

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
162.	To know how the mind of the criminal works.	L	I	D
163.	To plan how to work to manage people, to run a firm success fully.	L	I	D
164.	To make leather goods bags etc.	L	I	D
165.	To keep a systematic account of money spent and received.	L	I	D
166.	To make and write stories of your own.	L	I	D
167.	To drive a railway engine.	L	I	D
168.	To inquire about the price of articles in the market.	L	I	D
169.	To do fine engraving work on wood, metal etc.	L	I	D
170.	To rise chickens, ducks and other fowl and eggs to sell them.	L	I	D
171.	To sell tickets for a lottery or four your school show.	L	I	D
172.	To know how the human mind works.	L	I	D
173.	To draw cartoons or humorous sketches of persons or animals.	L	I	D
174.	To make attractive designs and posters for advertising.	L	I	D
175.	To answer telephone calls, give the information or messages to other.	L	I	D

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
176.	To prepare varnish, paint or polish at home.	L	I	D
177.	To discuss with friends how all persons can live in health and happiness	L	I	D
178.	To write articles for school paper or a local newspaper.	L	I	D
179.	To lead on outdoor life of adventure and physical work.	L	I	D
180.	To make a radio-set at home.	L	I	D
181.	To see an operation being performed by a surgeon.	L	I	D
182.	To go on doing the same thing mechanically for long time.	L	I	D
183.	To be placed in charge of making arrangements for school sports or concerts.	L	I	D
184.	To make articles of wood like tables, chairs, boxes, etc.	L	I	D
185.	To experiment with chemicals can pining different materials to see the effect.	L	I	D
186.	To know how sound is recorded on gramophone record.	L	I	D
187.	To feed, water and take care of cows, bullocks and horses.	L	I	D

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
188.	To look closely at big buildings and appreciate the architecture.	L	I	D
189.	To rewrite sentences until they express just what you want to say.	L	I	D
190.	To estimate the value of buildings, motor cars, plots of land, etc.	L	I	D
191.	To know all about coal, iron and other metals and their manufacture.	L	I	D
192.	To part in debates.	L	I	D
193.	To use saw, hammer, nails, etc. to repair articles.	L	I	D
194.	To read the lives of great men of the past and present.	L	I	D
195.	To follow political events and current topics in newspapers etc.	L	I	D
196.	To visit the homes of needy people and help them.	L	I	D
197.	To know how mental desires or mental troubles are caused.	L	I	D
198.	To type out your letters the surface of the earth.	L	I	D
199.	To know what is inside the surface of the earth.	L	I	D
200.	To protect the life and prosperity of others.	L	I	D

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
201.	To know how soap and oil, cream etc. are manufactured.	L	I	D
202.	To know the details of an atom or hydrogen bomb.	L	I	D
203.	To help others to settle their quarrels word by word.	L	I	D
204.	To knit socks, vests etc.	L	I	D
205.	To write a drama or an essay on the subject of your choice.	L	I	D
206.	To visit sick persons in hospital	L	I	D
207.	Waiting personal letters.	L	I	D

If you have any other interest other than our check list, please mention it in the following space.

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No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
208.	Administrative Officer	L	I	D
209.	Ambassador			
210.	Artist			
211.	Actor			
212.	Army Officer			
213.	Athletic Director			
214.	Air Force			
215.	Agriculture			
216.	Bank Service			
217.	Bank Manager			
218.	Business Firm Manager			
219.	Building contractor			
220.	Blacksmith			
221.	Beautician			
222.	Broker			
223.	Businessman			
224.	Cartoonist			
225.	Chef			
226.	Clerk			
227.	Custom			
228.	Doctor			
229.	D. V. C.			
230.	Durgapur Steel Plant			
231.	Dairy Technology			
232.	Dairy man			
233.	Draft man			

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
234.	Driver			
235.	Engineer			
236.	Education Director			
237.	Fashion Designer			
238.	Film Actor			
239.	Food supply			
240.	Farmer			
241.	Geological Survey			
242.	Homeopath Doctor			
243.	I. F. C.			
244.	I. A. S.			
245.	I. P. S.			
246.	Interior Director			
247.	Interpreter			
248.	Income Tax			
249.	Judge			
250.	Journalist			
251.	Jewelry			
252.	Jewelry Designer			
253.	Lecturer			
254.	Librarian			
255.	Leather Worker			
256.	Lawyer			
257.	Musician			
258.	Music Director			
259.	Model			

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
260.	Medical Trascriptor			
261.	Medical Representative			
262.	Novelist			
263.	Navey			
264.	O. N. G. C.			
265.	Pilot			
266.	Poet			
267.	Player			
268.	Primary School Teacher			
269.	Poulter			
270.	Publisher			
271.	Physiotheapist			
272.	Pathologist			
273.	Private Tutor			
274.	Painter			
275.	Professor			
276.	Police			
277.	Postal Service			
278.	Port Trust			
279.	Radio-Actor			
280.	Scientist			
281.	Singer			
282.	Sculpture			
283.	School Teacher			
284.	Sales Man			
285.	Translator			

No.	Activities	Linking (L)	Indifferent (I)	Disliking (D)
286.	Textile Designer			
287.	Telephone Operator			
288.	Tours and Travel Manager			
289.	T. V. Actor			
290.	Veterinary Surgeon			
291.	W. B. C. S.			
292.	Writer			
293.	Wood Curver			
294.	Whole Dealer			

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