C H A P T E R I

INTRODUCTION

One of the major challenges to education, today, is the rapidity with which schools must adapt to changing social conditions. Our society is facing challenging transformations. Educational change though still tends to lag behind, it is generally admitted that there is heightened concern for educational change. Steady endeavours are being made by educationists to improve our educational system by introducing many new ideas, new programmes, new methods and techniques which are called 'Educational Innovations'. A good amount of fund, energy and time is devoted to the development of innovations and planning, sophisticated execution of the change process in keeping with the dynamics of a rapidly adjusting society. While the rapidly changing society with increasing needs is placing greater and greater demands upon our educational system, it is but natural that innovative programmes emanate from both the State governments and the Centre.

Education is changing rapidly because of technological development and consequent sociological compulsions. This phenomenon is universal. It will be helpful to analyse in brief, the broad sociological transformations or emerging changes which call for a new educational approach.

Firstly, the steady population increase has brought with it a multitude of problems. The increased demand for more teachers, more classrooms, more equipments, more books, and supplies has taxed the resources of most communities. The explosion of population continues as one of the great unresolved issues.

As the policy of our democratic nation is to provide suitable educational facilities to each and every individual, the school curriculum and its pattern of organisation must change considerably to accommodate the masses of students demanding to be educated. Unique ways of meeting the problem of increased enrolment must be tried out. It will not prove an effective answer to continue adding pupils to already over loaded classes in our community. Newer practices should be evolved to tackle the increasing population problem of the school.

Secondly, technological development and improved means of transportation have increased the mobility of the population.

The constant shifting of population creates many burdens for school systems, particularly in places which provide opportunities for better job and 'good life'. Important for schools is the shift from a rural to an urban population which is related to modernization, industrialization and mobility of people. It often brings underprevileged and culturally deprived rural pupils to urban schools creating a problem of increasing complexity and urgency to the larger cities. As the sociological composition of communities changes, schools must adapt their educational programmes accordingly.

Thirdly, there are the details of the curriculum and proper instruction. Expansion involves a new orientation for teachers for most disciplines, especially those related to science, mathematics and technical subjects. Apart from this, the educational institutions are confronted with another kind of problem, viz. expansion of knowledge in all the disciplines - specially mathematics, sciences and technology. The implication of the increase in knowledge for teachers are staggering. Choice must be made as to what content and what ways of approach to it, will be most beneficial in preparing citizens in a changing society.

Fourthly, the steady increase in knowledge and the process of industrialization have highlighted the need for

specialisation. Highly specialized skill is demanded by the society for which special training is required. As the educational institutions are parts of the changing society, continuous change for the 'better' is essential. Today's classrooms cannot be like yesterday's and tomorrow's classrooms cannot be the same as today's. With explosion of knowledge and the increased rate of obsolescence of knowledge, we cannot afford to have a groove or mould to pour the coming generation in, following the same pattern of yesteryears. With changes in the knowledge, the techniques have also changed giving more emphasis to the learning by keeping in mind the impermanency of the knowledge of today. The techniques have to be necessarily in terms of keeping up the pace with which the changes occur.

Fifthly, in the world of today, the most dramatic area of change relates to the concept and knowledge of space. Continuing explorations of space and experiments in communication are affecting industries, professional practices and just plain people in all walks of their life. Not quite so spectacular, partly because they are less obvious and not within the reach of the common people, are the changes that automation and the electronic developments are bringing to business, industry and the various occupations. The use of computer in many fields has speeded up the rate of change

by many years. The time is not far away when the computer will not only control the space flight but will be controlling the whole economic life of a country. Computer would control production, manufacturing of specific items, distribution and consumption. The implication of the services of such devices hold a tremendous potential for improved instructional techniques in classrooms as well. The whole field of cybernatics forecasts a great change in every one's life in the near future.

Coming down, specifically to our own country, explosion of population, expansion and consequential changes in knowledge, rapid development of industrial sectors, shift from rural to urban areas and mobility of population due to improved communication system, are forcing rapid changes in educational institutions. As ours is a developing country the rate of change has to be still faster. We need to adjust to the changes that are occuring in our own country which ultimately should keep pace with the rapidly changing modern world. After independence, we have concentrated all our efforts to make our society a better one. For this purpose we increased schooling facilities as education is one of the tools for betterment. To bring about reforms in the schools

in desired directions several institutes and departments came into being, such as the National Council of Educational Research and Training (N.C.E.R.T.), the National Council of Secondary Education (N.C.S.E.) etc. Extension Departments were organised in all the States. Several commissions and Committees, such as, University Education Commission, 1949, Mudaliar Commission, 1952-'53, Education Commission, 1964-66 were appointed to evaluate the existing educational programmes and to recommend desirable improvements. Training programmes for administrators and school teachers were organised and are being organised to prepare them for adapting new practices. But the rate of adoption of innovations in Indian education is very slow. If our society is to survive, the rate of change should be accelerated. That is why the field of 'Diffusion of Innovations' is demanding greater and greater attention by the educators.

In our national reconstruction and development the first and foremost programme is the development of human resources through more and more education. A democratic and socialistic country as ours has to emphasise mass education and equalisation of opportunities. That is why Indian Constitution has directed for free and compulsory education of good quality to all the children in the age group 6 - 14 years. This is the prime factor which is putting pressure of

enrolment in schools. To add to this pressure, there is the increasing social awareness in the country for more education. These two factors together have increased the pressure upon schools and the enrolment in the educational institutions is increasing at a very fast rate leading to an unmanagable size of the class. We are, also, striving for reducing the wastage, as a consequence of which there will be further increase in numbers in schools adding more to the size of the class. To handle such increasing size of the class we need to have new methods, innovations and innovative teachers.

As education is becoming compulsory and universal, the school is becoming more heterogeneous not only in regard to the home and social background of the children but also in their mental make up and personality dispositions. The need to deal with such heterogeneous group, again, calls for an innovative teacher.

One more problem is cropping up which needs immediate attention i.e. problem of student unrest. This is mainly a reflection of the dissatisfaction created among students due to lack of harmony between social changes out side and our present education system. The social changes are not reflected in today's classroom teaching. We are still continuing with those age old methods and curriculum. Most

of the teachers follow the old pattern and are reluctant to change. Lack of innovative teachers and their refusal to change are responsible for this problem to a certain extent. At this juncture, before things become rather serious we need to evolve innovative strategies and put our education system on right lines.

The educational planners are striving harder to find out factors that facilitate or hinder the introduction of new educational practices into our schools. Though the key figure for bringing about change in our school is the principal, a knowledge of the personal factors of teachers in the school is also worthy of attention as they are the executors of new plans made by authorities. A knowledge about the process of educational change, the diffusion process, will certainly help to bridge the gap between what is done and what should be done in any institution. Inadequate knowledge about the process of diffusion and change is a major obstacle to bringing about improvement.

What the innovations should be like ? How should they be communicated ? What qualities in the administrators and in the teachers should be developed for successful implementation of innovations ? These are some of the questions about which the educational world is concerned. Still very few studies in India have been conducted to answer these questions.

The major issue is to study the process of educational change as it is developing and as it should develop in our country. Very few studies have been reported in this area though a significant number of studies have been completed in the area of agriculture and rural sociology in India. The diffusion process, adoption of educational innovations, categories of adopters, factors affecting adoption are some of the problems requiring thinking and sustained studies. A clear understanding of these concepts as applied to education is important.

DIFFUSION PROCESS

In dictionaries the word diffusion is defined as 'spreading', 'extension', 'distribution', 'dispersion', 'a process of equalization of physical states'. Thus the 'diffusion process' commonly denotes 'spreading in all directions'. This term has been widely used by social scientists in social researches to describe the process of spread of an innovation from its source to its users. The process by which a new idea from its source of origin to its ultimate user in a social system gets diffused, has attracted the attention of many social scientists and a number of research studies have been completed in different traditions such as rural sociology, education, industry, etc. which give comprehensive

guide-lines about the 'diffusion process'.

The most comprehensive definition of the diffusion process as given by Rogers (1962,p.13)is 'The diffusion process is the spread of a new idea from its source of invention or creation to its ultimate users or adopters'. So it is a process by which an innovation spreads. Bhola (1967) also gives a similar definition. According to him,

> ...diffusion is the process involving information consumption, social interaction and behavioural change, through which an innovation is incorporated into a configuration, tending toward a socio-psychologically stable and integrated relationship with the cognitive-affective - motor structure of that configuration. (Bhola, 1967, p.49)

The above definition clarifies that diffusion is a process related to adoption of an innovation in the entire system and the essence of the diffusion process is human-interaction.

However, the diffusion process cannot be taken as a synonym for the communication. According to Leagans,

> ...Communication is the process by which two or more people exchange ideas, facts, feelings or impressions in ways that each gains a common understanding of the meaning, intent and use of messages...Communication then is a conscious attempt to share information, ideas, attitudes and the like with others. (Leagans, 1961,p.364)

Winifield (1957) defines it as the movement of knowledge to people in such ways that they act on that knowledge to achieve some useful results. Hovland et al. (1963) have given

an operational definition of communication with reference to psychological studies of opinion change, 'as the process by which an individual (the communicator) transmits stimuli (usually verbal) to modify the behaviour of other individuals (the audience)'. According to Dube (1960, pp.128-129), 'Communication is a two-way process; it involves giving as well as receiving information and direction'. All definitions emphasise that transmission of knowledge from one who knows about the innovation to the one who does not know about it, is communication. But the term diffusion is broader and more inclusive than communication. In fact, communication is one of the elements of the diffusion process. A careful scrutiny of the definitions of the diffusion process reveals that there are four crucial elements or ingredients of the diffusion process. They are, the innovation, its communication from one individual to another, in a social system, over time. Katz (1961) also identified these four elements as essentials of diffusion study. According to him, the first step in diffusion is the tracing of an innovation, second, over time, third, through specific channels of communication i.e. media of communication and lastly within a social structure.

Innovation : An innovation is an idea or a thing perceived as new by the individual concerned. Perception of newness is more important rather than the real novelty of the idea.

Communication : Communication is the essence of the diffusion process. Interaction between individuals is essential for the diffusion of an innovation. Of course, the social relationship of the communicator with the communicatee decides the interaction pattern and its results. In interaction essentially there are two poles - one who knows about the innovation and the other who does not know. The two poles can be just two individuals, an individual and a group or two groups.

Social System : Social system is collection of individuals who are functionally differentiated and engaged in collective problem solving behaviour. The collection of individuals may form formal or informal units and the individuals of this unit are linked up with each other for a particular purpose and co-operate with each other to solve the problems that arise in connection with that particular common goal.

Over Time : Diffusion of innovation takes place over a time period. A person learns from another and becomes aware of the innovation. After becoming aware of the innovation till its adoption i.e. taking the final decision to make use of the innovation he passes through several stages for which he takes time.

Diffusion process does not end when the adopting unit becomes aware of the innovation. The definition for the diffusion process given by Bhola (1967) emphasises the

incorporation of the innovation, into the configuration or social system. The process does not complete as soon as the innovation reaches the user. To complete the diffusion process, adoption and internalization of the innovation are essential. The process of diffusion is quite closely related to the adoption process. More awareness about the innovation does not guarantee the diffusion of the innovation. After becoming aware of the innovation, the person may become interested in it, evaluate it, try it and ultimately adopt it or reject it. Once the innovation is rejected it blocks the further spread of the idea. Adoption and institutionalisation of the innovation brings further scope for interaction which is the basis of the diffusion process.

Diffusion may be seen analytically as going - through the stages aiming at (i) disseminating information,(ii) maximizing interaction, (iii) facilitating behavioural change and action, and (iv) providing support and service for integration.

There is a clearcut difference between the diffusion process and the adoption process. The adoption process is the mental process of an individual through which he passes after first hearing of the innovation till final use of it. Adoption process is more similar to the thinking and decision making process. Diffusion is a process which is related to the adoption

of an innovation in the entire system. It is floating of an innovation from its source of origin to its adopters.

ADOPTION PROCESS

In recent past many studies have been conducted in rural sociology and education which have attempted to study the process related to the adoption of innovation and they have come out with different models of adoption process.

Researches on adoption of innovations have shown that adoption of a new idea or practice is not a snap or sudden decision but a mental process on the part of the individual. Studies in the field of adoption have concluded that it is not an impulsive act but it is a combination of series of acts or events. These events take place over a period and follow a particular arrangement. Adoption is not momentary decision. Rogers (1962,p.76) says, ' The adoption process is the mental process through which an individual passes from first hearing about an innovation to final adoption.' The adoption of an innovation by an individual in any field is a complex behaviour and the individual passes through distinct stages. All the researches on the adoption process have strengthened its sequential nature though they give different models of the process. The adoption process is a type of decision making because it requires a decision by the individual concerned. But it is a complex process because

several interrelated decisions must be made during the adoption process.

Probably it was Dewey (1910) who first analysed reflective thinking. His concept has been extensively used in case of decision making and problem solving in the field of education and psychology. More recently the concept has been used in rural sociology. As the concept is being used in many disciplines and widely studied, new nomenclatures for different stages have come into being. All the researches in different disciplines agree on the sequential nature of adoption but they do not agree on the number of stages. They have come out with models having different number of stages.

Ryan and Gross (1943) were perhaps the first to find out that adoption of a new idea consists of stages. They concluded that adoption of hybrid seed corn passes through four stages : (i) awareness, (ii) conviction, (iii) trial and (iv) acceptance. Pedersen (1951) in his study of cultural differences in adoption of farm practices found that a sequence of events leads to adoption. He used acceptance and adoption as interchangeable expressions without defining either of these.

It was Wilkening (1952b), however, who for the first time reported that adoption involves decision and that it is a process composed of stages or steps. In his opinion the

adoption of an innovation is :

> ... a process composed of learning, deciding and action over a period of time. The adoption of a specific practice is not the result of a single decision to act but of a series of actions and thought decisions. (in Singh and Pareek, 1968,p.90.)

Wilkening (1953) used four stages in the adoption process - awareness, obtaining information, conviction and trial, and adoption. Wilkening (1956) later on suggested only three stages - awareness, decision making and action. He found the three-stage model more efficient for studying the role of the change agent in communicating technological change. He was interested in studying the effectiveness of three types of information - learning about the change, information about help in deciding whether to try out the change and instructions about how to put the change into effect.

Wilson and Gallup (1955) came out with six steps - attention, interest, desire, conviction, action and satisfaction.

The sub-committee for the Diffusion of Farm Practices, North Central Rural Sociological Committee (1955), on the basis of literature then available suggested a five stage model in farm practice adoption - awareness, interest, evaluation, trial and adoption. The empirical validity of the model has been established by Beal, Rogers, Bohclen and Copp., Still and Brown and Sharma. Beal et al. (1957) interviewed

148 farmers of Central Iowa town and validated the stages - awareness, information, application, trial and adoption. Copp et al. (1958) also arrived at five-stage model of adoption i.e. awareness, interest, acceptance, trial and adoption and thus validated the concept of adoption process. Supporting the stage concept Copp and others state -

> It is quite natural that adoption for a technological innovation in agriculture should be regarded as a process. Adoption is an activity of the farmer taking place over a period of time. From first awareness to regular use, there must be a transformation in the orientation and behaviour of the farm operator. Adoption of a farm practice is a bundle of related events flowing through time, not an instantaneous metamorphosis. (Copp and others, 1958, pp.146-147)

Emery and Oeser (1958) viewed adoption of farm practice as a 'Consequence of Communication'. In their investigation of the adoption of new farm ideas among 36 farmers of Australia they used three stages - information, decision and action.

Coughenour (1960) followed a similar approach like Emery and Oeser and viewed adoption as a function of dynamic inter-relationship of independent elements expressed in terms of variables.

Rahim (1961) in a study of adoption in an East Pakistan village used four stages - awareness, information, trial and adoption.

Bose and Dasgupta (1962) have comeout with five stages of adoption - awareness, interest, trial, evaluation and adoption. Dube (1964) also supports these stages.

Rogers (1962) suggested five stages - awareness, interest, evaluation, trial and adoption. Pareek (1962) reviewing Roger's suggested that 'need' be added as the first stage. He also suggested a change in the nomenclature from 'evaluation' to 'deliberation.' Singh and Pareek (1968) in their studies of sequential adoption developed a paradigm and in their critical analysis have suggested seven steps in the adoption process - need, awareness, interest, deliberation, trial, evaluation and adoption. They have emphasised the importance of the first step in adoption process which is 'need.' Most of the researches of adoption process in the past have neglected this important stage. Most of the researchers assumed that the individual often becomes aware of an innovation by accident. The awareness stage just comes by chance randomly and it is non-purposive. However, Hassinger (1959) criticized the assumption of non-purposiveness of the awareness stage and he emphasised that the awareness must be initiated by the individual. In fact, Hassinger has used the concept which was brought into focus by Lewin (1947). Lewin, analysing the process of change in

the individual and group performance arrives at three phases :

1. Unfreezing - development of a need for change.
2. Moving - changing towards a new goal.
3. Freezing - making group life relatively secure against change at the new level.

Hassinger is also of the opinion that information about the new ideas often does not create awareness. Even though the individual may be exposed to information, he may not become aware of the innovation unless he has a problem or need which the innovation promises to solve. The same view has been emphasised by Singh and Pareek. They studied three agricultural practices intensively in a village near Delhi. They interviewed 94 farmer families and formulated a paradigm of seven stages.

It is important to note that the conclusion of the adoption process is either adoption or rejection of the idea. An innovation may be adopted at the end and used continuously or rejected or discontinued at a later date. But for the diffusion process to continue, integration or internalization of the ideas is very important.

Past researches have concluded that the variation among the persons lies in the understanding and adoption of new

innovations due to the individual variations in their personal characteristics such as age, education, social status, personality make up, attitude and values. Due to these individual differences, researchers have arrived at the concept of adopter categories.

ADOPTER CATEGORIES

Researches done on the diffusion process and adoption process show that all the individuals do not adopt an innovation at the same time. This is the main basis for studying innovativeness. It has been found by all the researchers, whether in the field of education, rural sociology or any other, that individuals adopt an innovation along a time continuum. On the basis of the time dimension involved in relation to adoption of improved practices the members of a social system are classified into five categories. The classification is based on the basis of innovativeness of the individuals. Unfortunately the terms used for different categories are not yet standardized and the researchers have used variety of terms. Gross (1942) used letters of alphabet (A,B,C and D) to denote the four categories of adopters that he came across.The North Central Regional Rural Sociology Sub-Committee (1955) categorises the adopters in four groups according to their innovativeness viz. 'innovators', 'community adoption leaders', 'local adoption leaders' and 'late adopters'. This classification incorporates time sequence

with the function performed.

The classification of adopter categories is done mainly on the basis of innovativeness of an individual i.e. depending upon the degree to which he is early or late in adopting the innovation compared to others in his social system. Chaparro (1955) used judge's rating to have adopter categories. But the most commonly used method for having adopter categories is to classify them on the basis of the relative time at which they adopt an innovation or innovations. As the adoption of an innovation tends to conform to the normal curve it is possible to classify the adopters on the basis of standard units. Rogers used the standard unit to classify individuals as innovators, early adopters, early majority, late majority and laggards. The area lying to the left of the mean year of adoption minus two standard deviation unit includes 2.5 per cent of individuals who are 'innovators'. This means that innovators adopt an idea earlier than 97.5 per cent of the members of that social system. Next comes 'early adopters' category. The members in this category are 13.5 per cent of the cases and lie between $\bar{x} - 6$ and $\bar{x} - 26$. Thirty four per cent of cases belong to 'early majority' category. They lie between the mean and mean minus one standard deviation i.e. mean year of adoption and point of inflection. Point of inflection is the point at which adoption ceases to increase at an increasing

rate and begins to increase at a decreasing rate. Between the mean and the other inflection point at right hand side where adoption begins to decrease at a decreasing rate, lie other 34 per cent of the adopters who belong to 'late majority' category. The last 16 per cent to the right of the inflection point are labelled as 'laggards'. However, these five categories are not completely exhaustive. An innovation is never completely adopted in a social system as new members come in.

Innovators are more venturesome and like to tryout new ideas. They are much more cosmopolite as far as social relationship is concerned. They adopt soon after they hear about an innovation. Early adopters on the other hand are more localite. An early adoptor is more an integrated part of his own system and respected by his peers. Early majority adopt the innovation just before the average member of the system but they are seldom accepted leaders. Late majority adopt the idea soon after the average members of the group. They receive motivation for adopting the idea from their peers. Laggards are the last one to adopt an innovation. They are most localite in their nature. They are most conformist to tradition and are not easily convinced of the utility of an innovation. There is a long time gap between their time of awareness of an innovation and its adoption. Both these

adoption of stages and adopter categories in a way are related to the change agents who are more important as diffusing agents of new ideas and practices. That is why 'it is sometimes assumed that understanding the change-agent role in any program for social change means the ability to apply techniques of change or to speak glibly of the strategy of change' (in Rogers, 1962, p.254).

CHANGE-AGENT

Rogers says, 'A change agent is a professional person who attempts to influence adoption decisions in a direction that he feels is desirable.' (Rogers, 1962, p.254). Though a change agent's efforts are mainly directed for the adoption of innovation he may also work to slow the diffusion and prevent the adoption of certain innovation.

Past studies reveal that various information sources and communication channels perform different functions in the adoption of innovations. At different stages of adoption to different adopter categories, change agents play an important role. Rogers (1962) derives two generalisations from past researches about change agents.

1. Commercial change agents are more important at the trial stage than at any other stage in the adoption process. This generalisation has been supported by the works of Ryan and Gross (1943), Beal and Rogers

(1957), Copp and others (1958). This is the most critical stage in the adoption of new ideas because continued use or rejection mainly depends on this stage. Success of the adopting unit at this stage ensures the full use of the innovation.

2. Commercial change agents are more important for earlier adopters than for the later adopters at the trial stage. This is again supported by the findings of Beal and Rogers (1957 b) and Ryan and Gross (1943).

There is no dispute over the fact that modern society is changing at a tremendous rate -/at an unprecendented speed. Achievement of world in scientific knowledge as well as in other fields is overwhelming. But for the application of systematic and appropriate knowledge to human affairs for the purpose of creating intelligent action and change, focus on planned change is required. A planned approach to social change has become an urgent necessity specially in a developing country like ours, if our country has to cope with the changing needs of the society and the world. This necessity advocates efforts for a planned change in education which is again an instrument for social change. Longback it was realised that the entire basis of our educational system must be revolutionised. The education must not only keep pace with the great changes which have taken place in our society but it must direct the change in the desired direction for further betterment of the human race.

There has certainly been some effect of this realisation on our educational system though still it is lagging behind. Still increased clarity in our conceptualization is required which will lead to more intelligent control of the change process in education. There is no need to assume that education can be unplanned, automatic and arbitrary. Change has become a permanent and integral part of modern society. If education is to become a part of the movement and momentum of social change, then more knowledge is needed regarding the effective ways and means of instituting changes and innovations in the school system.

Maximum number of studies in the areas of innovations and change are reported from the field of agriculture. Most of the researchers in different traditions have dealt with the diffusion of hybrid seeds, characteristics of adopter categories, rate of adoption, characteristics of innovations, role of change agent.

THE AREA FOR THE PRESENT STUDY

Not many studies have been undertaken in the area of diffusion of innovations in education. The present study is concerned with some of the problems related to diffusion of an innovation in schools. The specific problem, the rationale underlying it and the variables are discussed in CHAPTER III.