TECHNICAL /TECHNOLOGICAL EDUCATION AND SOCIALIZATION

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ABSTRACT

One of the problems for us today in the developing countries is how to satisfy our basic needs and continuously tackle the tasks involved in securing the essentials of modern life in a changing and technological world. In order to survive, man must share some of the sentiments, traditions and values of the group in which he finds himself. If a human body could be taken away at birth from the mother and raised in a complete isolation, such an individual would lack the essential attributes of a human being. It is the fact of living together that makes man truly human, for man is by nature a social animal. Thus, man must live and grow up among his fellow men in a given group: family, school, village, town, state, nation or generation. The task of making an individual fit in and play his part in modern society is the concern of technical education and socialization. It is the purpose of this paper to examine the role of technical/technological education and socialization. It seeks to define technological education and socialization and to study the relationship between them. It describes the codes involved in the socialization of technology education.

Keywords: language codes, socialization, technology education

INTRODUCTION

Technological education defies any single, sharp and all – embracing definition because of its many facets. The concept could refer to the work done in technical schools or polytechnics and all specialized institutions of learning. It could refer to specialized study in polytechnics or colleges of technology and even universities regarding the preparation of technical, vocational or technological education services. Sometimes it is said that someone is studying ‘technology’ or “technical education”. Today, it is no longer the frontiers of science and technology which are at issue, but the frontiers of man. Broadly, technological education can be defined as all man’s activities which enable him to acquire a particular skill dealing with scientific, industrial, commercial or even traditional methods and their use so that he may become a productive human being or citizen.

Technological education can further be seen as the process of redefining the quality of practical experience to enable the individual to acquire knowledge and skills for direct application to the solution of the problems of society. It can further be accepted that technological education is a
process of harmonizing the individual with the environment in such a way as to enable him to develop his practical, mental and emotional abilities for the happiness and welfare of humanity. Again, it can be defined simply as the process of using available knowledge in a systematic way to problems in education and training; this process involves the development, application and evaluation of systems, techniques, and gadgets in the area of human education.

Technical and Vocational Education and Training are those aspects of the educational process involving, in addition to general education, the study of technologies and related sciences, and the acquisition of practical skills, attitudes, understanding and knowledge related to occupations in various sectors of economic and social life” (UNESCO and ILO, 2002).

Technology Education is an integrated, experience-based instructional program designed to prepare students to be knowledgeable about technology - its evolution, systems, technologies, utilization, and social and cultural significance. It results in the application of mathematics and science concepts to technological systems in areas such as, but not limited to: construction, manufacturing, communications, transportation, biotechnology, and power and energy. Students are challenged to discover, create, solve problems, and construct solutions by using a variety of tools, machines, computer systems, materials, processes and technological systems (Techlab, 2011).

According to Capriles (2010) technological education can be defined as the combination of types of knowledge indispensable to carrying out the necessary operations for transforming factors of production into products. Similarly, Beier and Kenz (2009) viewed it as all elements of knowledge, needed for the creation and operation of production and marketing facilities including both technical and business knowledge and ‘know how’ in management, business administration and marketing. Norman (2008) takes technological education to represent the sum of all knowledge, skills and method related to production, distribution and consumption of goods and services including their organization for the welfare and happiness of mankind.

A closer look at these definitions shows how technological education relates not only to the technical capability of the individual but also to the aggregate of all knowledge and expertise required for transforming inputs into outputs. This transformation involves rational organizational incorporation of scientific knowledge into a system of production which encompasses the technical, engineering, managerial, administrative, marketing and consumptive aspects of the whole economy (Ayuba, 2002).

A student of technological education can then be defined as one who studies a combination of the following skilled subject areas: Technical Drawing, Applied Mechanics, Food and Agricultural Technology, Materials technology, Automobile technology, Building Construction, Electrical or Electronic Technology, Metal Work Technology, and Woodwork. Others are Accounting, Book-keeping, Business Law, Commerce, Economics, Office Management, Shorthand, Typewriting, English language and Communication, Mathematics, General Studies,
Physics, Chemistry, Professional or Educational Studies, social welfare, education, environmental studies, sustainability and public health.

Socialization can be defined as the process by which individuals acquire the knowledge, skills and dispositions that enable them to participate as more or less effective members of groups and society. It is social learning, not only during the childhood, but throughout the life cycles that provide settings for behavior. That is why in (Whiting et al, 2006) it is said that from the moment of his birth, the culture into which a child is born shapes his experience and behavior throughout life. The study of socialization is necessary only to the extent that we believe that there is some usefulness in the idea that what happened to an individual when he was a child affects what he does as an adult. It includes what individuals learn, why they learn it, and how they learn it. It deals with the problem of how children, pupils or children are trained so that they will become adequate skilled members of the society to which they belong. Hussen et al., (2005) have recognized socialization as the whole process by which an individual, born with behavioral potentialities of an enormously wide range, is led to develop actual behavior which is confined with a much narrower range – the range of what is customary and acceptable for him according to the standards of his group. They see it as the process by which an individual becomes a member of his social group through acquisition of the group’s values, motives, and behaviors.

There is a fundamental question which all societies ask concerning socialization: How can the raw product of that society be transformed into workable human objects? Societies everywhere must mobilize their members as self-regulating participants in social encounters. Some of the ways of mobilizing the individual for this purpose are through rituals, initiation, imitation, demonstration or awareness. The individual is taught to have feelings, pride, honor, discipline, patriotism, dignity, and a certain amount of determination to succeed. These are some of the elements of behavior which must be built into the person if practical use is to be made of him as an interactant. The process of socialization therefore gives rise to feelings, pride, honor, discipline, patriotism, dignity, education and industry. It is a process that cannot be separated from the demands of social and cultural situations.

My thesis in this paper is that the present systems of education of most developing countries are geared towards producing consumers whereas it should be producer-oriented. There is an urgent need for us today to socialize the teaching and study of science, technology and vocational and technical education at all levels of our educational systems. Such a socialization of science, technological, vocational and technical education will help hasten technological growth and lead the crusade against graduate unemployment for a new social and economic order. The acceptance of the future graduate of a developing country will depend on his relevance and contribution to society through the application of his latent knowledge of the creation of the new indigenous values and gadgets, and the evolution of innovative ideas. In order for the individual to be a competent interactant who participates fully in the activities of his society, the society helps him to acquire two fundamental codes: language codes and value codes.
Language Codes

All children acquire fundamental learning codes in their family and schools during the period ascribed to socialization. The language code gives the child the categories for structuring and communicating experiences. The value code defines for him the quality of being useful or desirable. In a way, language becomes a thinking process; the value determines what in his experience, he will accept or reject. Therefore, central to the socialization process is the acquisition and use of language. It is the language that provides the link between the child and the human primary group. As a community of gestures, any language can be regarded as a community of symbols, meanings and utterances. The use of language calls out for speaker and listener. The conversation has two sides: one spoken and one internalized in terms of thought.

According to Ezike (2006) “the students of science and technology in our polytechnics must not only study the invasion of technology and machines and their manipulation and control but also learn their own identity, the identity of the ‘self’ as the point of intersection in a network of social relationships, traditions and culture hidden in our work or art”. Since English language is our only means of communication with the outside world and even within the heterogeneous tribes in some of our countries, especially in the African context today, we must settle down to study the use and practice of the language so that anyone who has come from some other part of the English-speaking world can understand us without difficulty. Given that it is the medium of instruction in schools and polytechnics in most of our countries, it represents for us a thinking process. It is, therefore, the centre of education and learning in a modern world. Language is more than a random collection of words; it has logic and form imposed upon it by society. This logic is the logic of grammatical usage. The manipulation of symbols according to grammatical conventions makes possible the elaboration of complex relationships between things, actions, and attitudes otherwise impossible. The student of technological education must settle down to study again this medium of instruction in the tertiary level. To ignore this, is to pursue shadow. In the words of Luria (2004, p. 15) “language enables the child to form concepts, to draw conclusions from accepted assumptions, to master logical connections, to cognize laws, far surpassing the boundaries of direct, personal experience”.

Language is behavior in business and education. Luria’s investigations above into the way in which speech assumes the role of regulator of behavior suggest that it falls into a number of stages. In the first stage, which concerns us here, the speech of the child is insufficiently developed for it to regulate the child’s motor reactions. Similarly, sometimes, the speech of the adult in the medium of instruction is insufficiently developed to regulate his cognitive, affective and psychomotor activities at the tertiary levels of education. This situation is unfortunate and calls for change. Although language is a thinking process, the precise connection between language and thought is still a matter of absorbing experiment and speculation by psychologists, philosophers and language scholars. But we are well aware of how our ability to “think things out” depends on our command of language. When the power to communicate in the medium of
instruction is lacking, the process of remaking or transforming the quality of experience to enable the individual to partake in the interests and ideas current in the social group is reduced significantly. As we in the developing countries of the world come to embrace modern education, science and technology, the sharpening of our logical communicative tool becomes a matter of great practical importance.

These considerations make it mandatory for us to intensify the study and teaching of English language and communication at the tertiary levels of education. Besides, language joins the individual with the group and links him with education. As a conversation of gesture the language of instruction mediates and produces the socialization process. As people in higher education acquire the practice and use of English, the skill of taking the technological and educational attitude of the others increases and more complex interactional exchanges result. Equally important is the concept of value in the socialization process.

**Social Value Codes**

Technical/technological education and socialization are both deliberate processes, carried out by particular agents and based upon well-defined norms. But who are these agents and what are the norms? Agents of technical/technological education and socialization are adults and the society. They include the family, peer-groups, students, teachers, governments and other experienced and knowledgeable members of the society.

It is during the infancy and through the parental care of the child that the system of behavior is developed. It is obvious from experience and researches that different patterns of child-rearing will lead to differences in adult personality. Education, science, technology, language, economics, social and political organizations play very important roles in determining the behavior of child-rearing agents. According to researchers in child-rearing, child behavior is an index of child personality, while adult behavior, his beliefs and values are indices of his personality. Whiting et al, (2006) gave a description of the systems of value and behavior. These are succorance, nurturance, self-reliance, achievement, responsibility, obedience, dominance, sociability, and aggression. Whiting and his co-authors defined succorance as asking others for help, nurturance as giving help or emotional support, self-reliance, as doing things oneself; achievement, as striving to meet internal standards of excellence, responsibility, as performing one’s expected role, duties, obedience, as attempting to meet the demands of others, dominance, as attempting to change other’s behavior, sociability, as making friendly approaches to other people, aggression as hurting others.

As the infant develops into childhood he starts moving into the wider world of his society. He socializes with his playmates. This contact gives him part of the social requirements of the members. The relationship develops into boys and girls in the primary school. Later they form age groups and associations in secondary schools. These age groups and associations have great influence on the character of the young person. Different initiations take place. It is during some
of these initiations that the young person is acculturated. He is further educated in the educational policies of his society. It is at the secondary level that the young person decides to pursue either a university education or a vocational and technical education. To decide to pursue vocational and technical or technological education is to re-enforce the belief that the basis of a liberating education must be productive work either within the small community, on the farm, in business or in industry. But conviction about the correctness of his belief does not necessary lead to successful practice, and the pedagogical problems connected with the provision through the technological studies of a truly liberalizing education are formidable.

It is probably helpful at this stage to mention our double process of socialization: the socialization of the individual in the society and the socialization of the individual in the polytechnic. There are discontinuities between what we do in some of our homes and what our students do at Polytechnic. The Polytechnic, for instance, requires an achievement ethic, with consequent high valuation of the future, deferred gratification, and a symbolic commitment to success. The polytechnic assumes that every student has had an opportunity to acquire beliefs that anyone can get on the top, and that if he works very hard, he too can reach the tops. The future, not the present, is what matters particularly. The young person must, therefore, use the present to prepare for the future. Time waits for no body and must not be wasted. Time is valuable. The saying that “Time is money” is particularly true at the polytechnic. It is expected that the student will be able to defer immediate pleasure for greater pleasure through symbolic commitment to hard work and success. He will study now in order to become a technical teacher, an engineer, an accountant, a secretary, a businessman, a hotel supervisor, or a technologist in future. These are not only the values of the polytechnic; they are also the values of families in which many of the students are socialized before coming to the polytechnic.

At the end of the scale, other children or pupils have experienced a survival rather than an achievement ethic with consequent high valuation on the present rather than deferred gratification. Where these children live hardly anyone gets to the top. Time is not potentially valuable if there is not going to be anything to do with time. Familiar questions from the basic structure of concern here: How is time to be used? Why should we not enjoy the present? And what does an appeal to symbolic success mean where success can be measured realistically only by survival? These children or students in contrast face severe discontinuities when they come to school. These discontinuities sometimes have profound effect on their behavior toward school and the school’s behavior toward them. All these tend to emphasize the inculcation of attitudes which make it possible for future scientists and technologists to pursue, adapt and apply the theoretical principles they have learned to industrial, commercial and educational activity. The other focus of interest in all these will be the role of tertiary education in the socialization of technological education.
The Role of Tertiary Education in the Socialization of Technological Education

The Polytechnics and any other tertiary institutions have a challenging role to play in the socialization of technological education in the development of a country. The tertiary institutions must indicate the obstacles to the development of a sound theory capable of guiding training for industry, agriculture, commerce, pedagogy and factory. First, the traditional concepts of a dichotomy between education and training are no longer appropriate. Secondly, the old form of apprenticeship is now inadequate. This is because it involved the retention of long periods of training, far in excess of time needed to learn the appropriate skills. Again, it gave rise to abuses. Apprentices became a source of cheap labor. In the developing countries like ours, many of the apprentices were taken on without any form of verbal or written agreement about their training. Thirdly, the traditional conflicts between employers and employees as well as between the industrial and educational Interests are gradually vanishing, though they still remain powerful as illusions. Even in an era of technological advancement, the necessary role of governments of majority developing countries in the formulation and implementation of policy for technical/technological education has not been sufficiently recognized in these countries. A situation in which these institutions are starved of funds is totally unacceptable. Insufficient funds affect teaching, research, planning and infrastructural facilities in these institutions.

The polytechnics, colleges of technology and universities of technology must be properly funded to enable them play a vital role in the development of their countries. Technological education must be seen as one of the most, if not the most, important areas of profitable and productive investments. The economic value of technological education must be sufficiently recognized, and government spending on this form of education can be justified on national grounds. No longer is training for industry, commerce, research, or education thought to benefit only employers. It benefits all.

Educational policies of these developing countries should be aimed at producing people who could use their hands and brains with equal dexterity. Most developing countries had over the years produced a class of people from their universities who looked at education as a preparation for a clean job commonly referred to as a “white collar job”. It is becoming clear that even if education is necessary to progress, it is not by itself sufficient. It is becoming increasingly clear that mere literacy or academic knowledge was no longer a guarantee for a good job. The present graduate unemployment in these countries is a case in point. Policies of education in these countries should be made in such a way as to convince the youths that not all students were suited for a purely academic type of grammar school education and that it was not necessarily the best preparation for future employment or for building technology- oriented nations. Today the level of practical and theoretical knowledge needed to meet the demand of technology- oriented nations is far higher than before and it is rising rapidly. This is why polytechnics in these countries must be properly equipped to enable them to take their rightful place in the educational process of their countries. There is no doubt that at top level, industry, commerce, factory, and
education need intelligent men and women with a polytechnic training equal to or going beyond that provided in a university program. Whether the universities provide the appropriate environment and courses of study suitable for the various categories of engineers and technologists is an open question, but there is no doubt that the polytechnics and the colleges of technology should be competing successfully with the traditional professions for the most highly gifted scientists and technologists.

The colonial educational system of some of these countries did not equip their pupils or graduates with life outside the classroom. This is why industrialists and employers of labor of these countries frequently criticize harshly what is provided in institutions of higher learning, saying that much of the content is irrelevant to the work being done in industry, commerce and factory and that the attitudes of university men do not result in efficient work. Where knowledge for its sake is still held in high esteem in universities, fundamental research is regarded as more important than applied research. Doubtless when the universities fail to accommodate themselves to demand for a more practical way of training technologists, attempts have been made by some of these governments to set up within a framework of tertiary educations such as State/Federal/National Polytechnics/National Technological Institutes and Universities of Technology to meet this demand.

In the words of Ibrahim (2004), “Polytechnics are not established just as another set of institutions of higher learning; they are not only centres of learning and research but also institutions for technological invention and development”. Polytechnics are unique institutions of higher learning where technological knowledge and skills are acquired for direct application to solution of the problems of the society.

Ezike (2006) has pointed out that the skills needed here are not merely skills of the hand or even of brain but also social. Technological education is not only one which emphasizes direct application of knowledge but equally a process of enabling cultural transmission and social change to take place harmoniously. This is because there are habits and techniques which are supported by attitudes, traditions and models of feeling. Western technology is the outcome of the functioning of that particular society. Our acquisition of technology must take care of the functioning of our own kind of society aimed at achieving a better life for our people.

But what is better life? How can we define better life for our people? Shall better life be modeled on the antiseptic, efficient, dynamic, moneyed and phrenetic cultural pattern of the technological west? Or shall it be the contemplative, leisurely, mystical, class – structured and traditional society of the developing third world area where we come from? These are nagging questions which must be tackled and resolved by the tertiary institutions of our developing countries particularly the technological institutions. Academics, Planners and administrators in higher education institutions in higher education institutions in developing countries must give to technological education in their countries a more practical – applied emphasis in agriculture, sciences, technology, engineering, education and commerce. Similarly, they owe it as a duty to
their countries to provide courses and indicate attitudes which are relevant to work in industry, agriculture, commerce and other arms of their national productive economic sector. Under such circumstance, industries and commercial houses might well have to undertake to provide them with more funds for such relevant training schemes.

For instance, a vocal leader of a rural population may want for his people motor cars, refrigerators, television sets, bicycles and higher purchasing power that come with the machine and modern technology. But the same leader may be reluctant to relinquish his village system, the status of his women, his hordes of servants, his religious observances and his political vested interest. He does not realize that modern technology brings with it a set of educational, moral and ethical commitments and socialization from which the invention sprang. Whether Polytechnics of these countries set up new patterns of education, or follow the traditional University system is challenging. But the question is whether these technological institutions can create in a new future indigenous technology without disrupting adversely their traditional and social environments. They can do this if, they inculcate the right attitudes: discipline, habits, self-control, time-consciousness, drives, industry, patriotism and ‘technicality’ in their products. These attitudes of a developed mind are a prerequisite to the building of a technology – oriented nation.

A closer look at the colonial educational system which some of these countries have been operating since their independence shows that it has little to do with productivity. Areas covered include: European History, English Language, Geography, Latin, Religious Knowledge, Government, Economics, Chemistry, Biology, Mathematics, Physics etc. Mohammed (2009) has made a very valid assessment of the situation. Says he, “Majority of the developing countries are facing an educational crisis which stems from a number of causes: Their educational systems are geared towards producing consumers, not producers and undue emphasis has been placed on lawyers, classics, historians and public administrators which are irrelevant to the socio-economic advancement of developing countries. Their national productive economic sectors are already unable to absorb the number of graduates in these disciplines who are produced by the university systems.

In Nigeria for example, 2009 alone, about 1500 lawyers were called to the bar at the Nigerian Law School, while majority of the states in the country do not have enough science and technology teachers with which to successfully run the new system of education”. In the same vein and as I can also see it in Cameroon, by the end of 2012, more than 1000 young people will be graduating from Cameroon Universities with degrees in history, literature, English language, French and anthropology respectively, while Cameroon do not have enough vocational and technical education teachers to run the more than 200 vocational and technical education/technological public institutions in the country”. These observations are valid in varying degrees. I suppose what Mohammed means by “educational crisis is that our educational system is aimed at producing job seekers instead of “job makers”. This situation has resulted in
an alarming graduate unemployment. As far as our educational system is concerned, what Mohammed says is a confession of failure. For what is the use of all that mass knowledge obtained from our tertiary institutions when it does not lead to productivity and problem-solving? Our tertiary institutions must, therefore, make structural adjustments in the faculties or schools to lay greater emphasis on technological education, and so reflect the aim of technology-oriented countries.

We may now turn our environments in which the socialization of technological education is carried out. In making efforts to socialize technological education, most of these country’s technical education Boards/ Directorates have diversified their technical schools curricular to include the following areas of study: Textile technology, Dress Making, Cosmetology, Catering Craft Practice, Footwear Manufacture, Fancy Leather, Commercial Studies, Auto-Electrical Work, Electrical Installation and Maintenance, Instrumentation, Refrigeration and Air-conditioning, Radio and Electronic Servicing, Computer Technology, Brick and Concrete Work, Painting and Decorating, Carpentry and Joinery, Furniture Making, Machine Woodworking, Mechanical Engineering Craft, Foundry Craft, Welding and Fabrication, Plumbing and Pipe Fitting, Agricultural Equipment, Vehicle Body Building, Light Vehicle Body Repair, Motor Vehicle Mechanic Work, Technical Drawing, English Language and Communication, Mathematics, Integrating Science, Social Studies, Business Management and Life Skills. These curricular goals are expected to advance the scope of learning in technical schools, arm the pupils with more practical skills. All that is required is to encourage potential authors of these countries to write textbooks with indigenous flavor in the above disciplines to facilitate teaching and learning in vocational and technical schools.

At the level of national development, scientific and technical/technological demands require that the science curriculum at entry level of education should be adapted to emphasize practical application as local needs dictate. As far as possible the totality of the population of these countries must be given the practical stimulation to redirect individual attitude to the context of the philosophy behind the establishment of these technological institutions.

At present, the bulk of candidates admitted into polytechnics come from non-technical schools. Those who qualify for admission come from the few technical schools. By implication, the polytechnics of these countries are presently catering for a small proportion of the masses. Doubtless the productivity of polytechnics in terms of qualified manpower of technological nature is bound to be negligible compared with the rationale of establishing these unique institutions.

Polytechnics and other technological institutions of these countries should establish as a matter of urgency a school of vocational and technical education. These schools should expand their department to hasten the production of teachers of vocational and technical education. These schools should not only initiate the Vocational and Technical Teachers’ Certificate programs but also Bachelor of Technical and Vocational, Master of Technical and Vocational and also Doctor
of Philosophy Programs. All that is needed is a proper mandate and powers from the various Governments to embark on such dynamic educational programs aimed at the socialization of technological education. The more the teachers are produced in this special area of education and training, the more there will be such qualified teachers in our vocational and technical colleges to socialize the teaching of science and technology.

CONCLUSION

In summary, technical/technology education and socialization have been presented as deliberate process by means of which society can turn its young people into productive human beings. Socialization is an instrument of conformity while technical/technological education implies conformity, productivity and social change. Technical/technological education will not only make an individual knowledgeable and productive but also equip him to function, create and modify his society with a view to making it more habitable.

Effective national education systems can equip members of a society to examine constantly their environment against the background of their development and well-being. If, from their observations, the existing language codes, value codes and general pattern of life militate against national development, such static codes or values can be replaced with more positive ones. Once a new pattern of education and life has been evolved, the process of socialization then popularizes it. The language codes acts as the facilitator in the process of education; it is the centre of any kind of education. The value codes points to the meaning, worth or desirability of the kind of education to be propagated in the society.

Technology is a science of industrial arts which serves as a fulcrum of advancement. According to Omorika (2005) “science is very important but, by itself, can contribute very little to the development of a nation”. If science must contribute to economic development, other complimentary inputs must exist: high level technical skills, strong money incentives, flexible and responsive technological institutions and organizational structures for mobilizing resources. Only then, can a scientific community be of great economic consequence. A technological breakthrough in a country depends on the ability of the country’s technological institutions and far-sighted leadership to create and co-ordinate the manifold infrastructural supports necessary to promote the development of industrial science and technology.

Faced with this situation, technological education is a combination of equipment and knowledge; it is knowledge that leads to the creation of new equipment and the acquisition of further knowledge. Doubtless knowledge is the central factor in technological education. But since knowledge is inherent in human beings, development of technological ability means socializing the great mass of our young people with technological education and improving the level of knowledge of those who already posses the skill. He who says physical development says also orientation of the minds of the people towards science and technology. Development in physical terms only will mean nonsense young persons are left in their raw, undeveloped state. In order to
help a young person pursue a technological education in future, effective socialization of science and technology at all levels of education must be propagated.

Technological education is more than training in specific skills: it must be a way of developing the all-round abilities of the individual, inculcating desirable attitudes to productive life and establishing worthy social and political ideals. The need to extend general education so that managers, technologists and technicians share the same basic knowledge, skills and attitudes must be pursued vigorously, especially in fast developing countries where democratic pressures make collaboration and co-operation an essential pre-requisite of economic productive success. Yet institutions and the governments, too, have to face the problems created by tradition and poor incentives. I regard technological education and socialization as very important matters. I do not regard money spent on them as money thrown away. I regard such expenditure as worthy investment from which our people, especially generations yet unborn, might gain invaluable and incalculable benefits.

Great industrial societies are the outcome of unbreakable link between industry and research. Applied research must be encouraged and pursued in the higher education institutions of our developing countries in order to strengthen and expand their industrial and technological base. It is difficult, therefore, to avoid the conclusion that the germs of the education of the future are to be found in the factory and industry system. This will be an education which will combine productive labor with instruction and physical culture, not only as a means of increasing production, but as the only way of producing fully developed human beings in a modern and technological era. Such education can only be achieved through effective socialization of technical/technological education at all levels for development and self-reliance.

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