ENHANCING SCHOOLS – INDUSTRIES PARTNERSHIP IN SCIENCE EDUCATION: IMPLICATIONS FOR NIGERIAN SECONDARY SCHOOLS

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Abstract

The rate at which scientific knowledge explode and the pace at which technology is rapidly changing demands much more than school science to catch up with industrial processes. The present parallel nature of school science and industries does increase the wide gap between modern day reality and out of date school science. To bridge the gap between school science and industries, cooperation between the two as partners must be developed and given the sanctity of curriculum approval. The benefits of this partnership are enormous: students acquire industrial skills, develop work habit, instill positive attitude in students towards industries etc. However, the paper discussed the model of school – industries relationship, need for curriculum reform for Nigerian science education, hindrances to schools – industries partnership. However, to harmonise science education as practiced in Nigerian secondary schools with industrial process, some recommendations were made.

Keywords: Schools – industries partnership, Science Education, Nigeria

Introduction

Science has become such an indispensable knowledge in the 21st century that any country wishing progress in human and economic spheres must not relegate science and technology to the background (Abdulahi, 2002). Furthermore, the amount of scientific knowledge and the application of such knowledge determine the economic prosperity of that country. Hence, the world today is being driven by science and technology. Harping on the issue of science and technology, Brown (1999) earlier posited that we must persuade the best and brightest of our students to help them shape their future. He contended that playing a part

in their acquisition of scientific knowledge and technology will engage them fully with the practice.

However, the rate at which scientific knowledge explode and the pace at which technology is rapidly changing, demands much more than school science to catch up with industrial processes. The present parallel nature of science and industries does increase the gap between modern day reality and out of date school science. To bridge the gap between school science and industries, cooperation between the two as partners in progress should be developed and given the sanctity of curriculum approval.

In his practical experiences between the science school and industries, Bello (2002) reiterated how relating lesson content to actual practices in the industries helped his science students imbibe properly the concept of water purification. He further demonstrated this concept by introducing the students to Water Board Laboratory, General Hospital Laboratory and the Textile Oil Mil (Vegetable). He noticed the enthusiasm and relevancy in students from what was taught in the classroom and the actual industrial experience. With these exposures, science becomes practical and lively. With this experience, given the right conducive atmosphere schools and industries linkage could develop into a strong and solid partnership. The case of Slovenian experiment on schools and industries cooperation in a small village called Kirka (Glazer, 1999) does amplify the prospect of such cooperation in wider economic terms.

Model of school – Industry Partnership

Here, we examine through the principle of modeling the relationships between students, society, schools, industries and teachers as pivots in the teaching – learning process.

Invariably, society encompasses schools, students and industries each trying to enhance societal economic prosperity. In essence, each segment overlapped the societal sphere as indicated below.

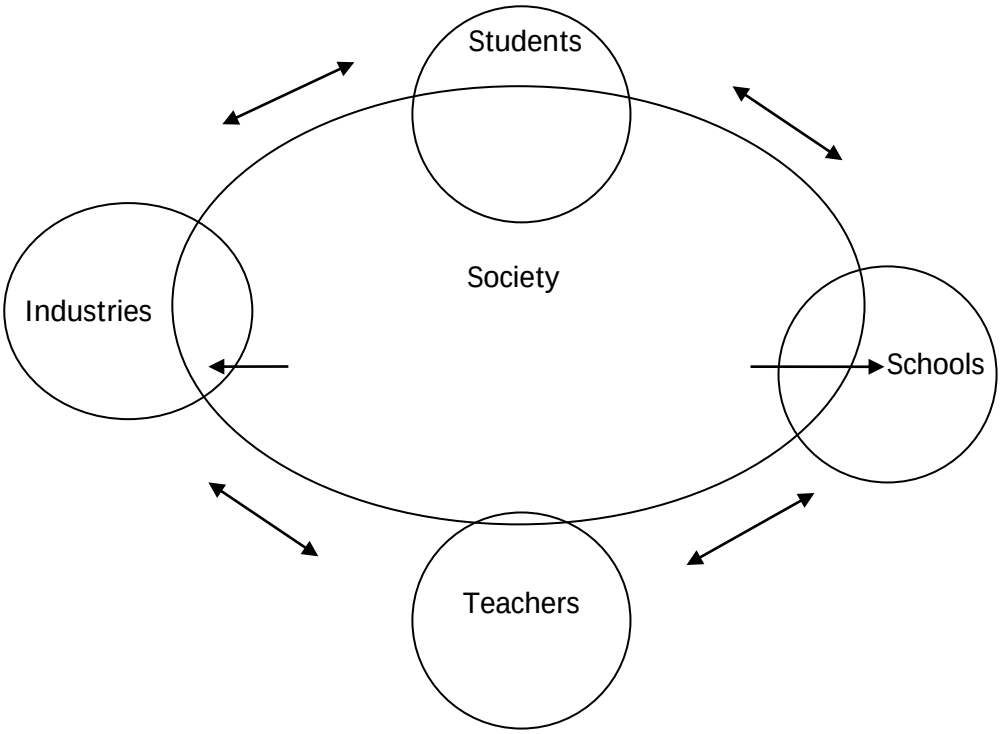

Fig. 1: Model of School – Industry Partnership

Furthermore, students and industries support each other in knowledge acquisition, research and development. After graduation students end up in one of the industries as staff. Teachers and industries support each other. Teachers need awareness of the latest development in industries whereas to industries, teachers are the trainers of their future workforce. Schools are run by teachers, so both schools and teachers are indispensable to one another. Students' fields of activities are schools. School prepare the students for learning societal needs and aspirations.

Science teachers are catalysts that will facilitate the desired cooperation between schools and industries. How conversant they are with the needs of the students and industries will make such cooperation result oriented. Teachers should explore science curriculum, pick out areas of interest to schools and industries and proceed to plan the kind of cooperation beneficial to students and the chosen industry. Invariably, the present science curriculum in the Nigerian secondary school may be silent on such cooperation, yet as we live in a high-tech world driven by modern science, it is imperative to accord recognition in the science curriculum the need to incorporate such linkage as part of the students' training programme. Teachers are used to stating aims and objectives of a lesson. Similarly science teachers should have a clearly defined aims and objectives of such cooperation. Without such a definition, much time and effort will be wasted (Thomas, 1982).

Need for curriculum reform

Since there is a yawning gap between modern science as practiced in Nigerian secondary schools, it is imperative that a systematic science education curriculum reform be initiated by government and educational policy makers. This will merge school science with industrial processings. When science teachers students and industrial scientists work in harmony, a synergy is raised which contributes towards economic growth of the country.

However, the curriculum should gear towards learning principles related to industrial, processes and not mere collection of facts to be memorized and regurgitated for examination purposes (Banu, 1975; Ahmed, 1981; Onwu, 1981 and Ikoku, 1982). It is suggested that 60% of the total learning situation should be devoted to students' practical projects and school – industry partnership, while 40% goes to theoretical lessons including guided students practical. In essence, this provides enough time for students to think individually and collectively towards tackling problems which require scientific approach.

In order to harmonize science education as practiced in Nigerian secondary schools with industrial process, the following details are recommended:

(i) There should be provision for schools for exchange visits with industries in the vicinity.

(ii) Charts and other learning materials affecting a particular industry should be provided to schools for learning purpose.

(iii) Incorporating basic principles related to the industrial process in the curriculum.

(iv) There should be provision of science teachers to spend some weeks in the industries relevant to their field of specialization during vacation in order to broaden their knowledge and industrial experience.

(v) There should be provision for industries to reserve 1 – 2% of their workforce to students on training. This is to acquaint them with the necessary experience and the scientific principles being applied.

(vi) Science teachers, students and industries could advance suggestion on students' projects. These projects could be locally based.

(vii) Industries should provide up-to-date knowledge on the composition and proceedings involved in making their product, industrial secret not withstanding because no country wishing to develop economically will insulate its educational institutions from industries.

(viii) Finally, the new curriculum should define and specify the nature of cooperation between schools and industries taking into consideration the proximity between schools and industries, the industries available and the optional nature of such relationship.

Hindrances to schools – industries partnership

(i) Teachers may not live up to expectation either due to poor pre-requisite training or lack of interest. The innovation, planning and initiative of teachers would have to count more towards the success of school – industry cooperation.

(ii) There is low-level of industrialization in Nigeria. Most schools are situated in rural areas where there is almost zero industry. The population of students in cities could overwhelm the few available industries and this could create logistic problems.

(iii) Frequent power failure and outages reduces the capacity to function and sometimes leads to closure and staff lay off.

(iv) Some schools will find it difficult to commit scare resource towards promoting school science and industries cooperation. Many of our secondary schools could not boast of adequate functional science laboratory.

(v) Teachers concern themselves about examination syllabus; and they are rated according to the number of credits scored by students in the examinations. Hence, these science teachers are interested in the traditional teaching and learning which prepare students for examination.

(vi) Some industries are overtly suspicious of people other than their staff. The tendency is to restrict such cooperation to simple visitation no better than sight seeing.

Conclusion

A careful perusal of the views enunciated above depicts the fact that science and technology are the pivots of today's world economy. Experience has shown that rapid economic growth and development in countries are achievable through industrialization. Hence, the need for schools – industries partnership in Nigerian secondary school system cannot be over-emphasized. For Nigeria to possess a sound technological base, schools – industries partnership is a sine qua non. This will encourage positive attitudes towards career in industries by future scientists and technologists.

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