CONTENTS

EDITORIAL

The thirteenth issue of the Annual Journal of Technical and Vocational Education has come up with its ISSN number which was a felt need since long and this of course gives status to this journal of international importance. In this issue, apart from contributors from India, we have got contributors from Canada, Nigeria and Taiwan.

The contribution of Canadian Community colleges through Canada India Institutional Cooperation project to thirteen selected Polytechnis of three states of Southern part of India is a remarkable phenomena of these years. Prof. Saxton in his paper on faculty accountability has narrated his experience in Canada on this account. With his experience in India he has attempted to explain the importance of faculty accountability in Indian context and how it can be implemented. Related to this Dr. Narayana Rao has come up with his vision of an ideal polytechnic. He has analysed the various dimensions in the functioning of a polytechnic and identified a set of attributes. Several guidelines appropriate for a polytechnic to become an ideal institution are also part of his paper.

Effective Management and Evaluation are important areas for an ideal polytechnic along with other components. Shri. Varghese and others in their study on training needs in educational management have identified sixteen major areas of training, indicated by the principals and Heads of Department from all Southern status of India. Mrs. Bedi in her study has described the existing system of student evaluation in the Northern states of India. She has identified the drawbacks in the system of student evaluation and has proposed interventions for improving the system of evaluation.

Community Polytechnic scheme in India has been contributing significantly in raising the standard of living of rural people through spreading technical vocational education. In his article Dr. Srinivasan has discussed the impact of community polytechnic scheme and he has made several suggestions for more effective functioning of the scheme.

This journal has always appreciated the contributions of academics of Nigeria. Mrs. Afugbuom for the issue presented her research experience of women participation in technology education in Nigeria. The study has implications in the Development of Technician Education for women in developing countries. Mrs. Ochuba has initiated the analysis of technical-vocational education for professional development and employment in the Nigerian context. Likewise Prof. Odunukwe in his article has described his analytical view on funding technical education in the depressed economy.

We get a different type of contribution from our colleagues from Taiwan. Prof. Chen Jung and Chin Lung in their study aimed at finding out the skill content for plastic injection mold worker and the skill which is suitable to be taught at various levels in technical education.

They have come up with several suggestions which are important to curriculum framers and technical vocational teachers.

In the present issue an abstract of the research study on evaluation of continuing education cells in polytechnic in Southern India conducted by Dr. Thanikachalam has also been included to enrich the journal with more empirical findings.

While appreciating the efforts of the contributors to this journal for the present issue, the editors appeal to the larger readership to come forward to publish their ideas, experiences, research work and practicing schemes for the benefit of the rest of the readers. Proposals are welcome to restructure our Editorial Board which we are planning to do before publication of next issue.

The last date for receipt of contributions to the next issue No. 14 is 31 May 1997.

— EDITOR

THE VISION OF AN IDEAL POLYTECHNIC

M. NARAYANA RAO

ABSTRACT

In the present article an attempt has been made to visualise the picture of an ideal polytechnic. The author by analyzing the various dimensions involved in the functioning of a polytechnic, identified a set of attributes. He has compared the conditions presently existing in a typical polytechnic with the desired characteristics of an ideal polytechnic. Several guidelines which were found appropriate for a polytechnic to become an ideal institution are also suggested.

Introduction

The attributes of an Ideal Polytechnic are presented in the first section of this paper. It is followed by a comparative analysis of the conditions presently existing in a typical polytechnic. The third and last part of this paper highlights certain guidelines which will be useful for Polytechnics in achieving the status of an "ideal" polytechnic.

Attributes of an ideal Polytechnic

The attributes of an "Ideal Polytechnic" are presented under the following six sub-heads.

1. Management and Policy

2. Relationships and Linkages with External Agencies.

3. Programmes and Services

4. Students

5. Staff

6. Physical Facilities.

1. Management and Policy

Autonomy and Mission

The Policy support provided by the Government and the style followed for managing the Polytechnic are critical for its effective functioning. Research findings indicate a positive correlation between the "Degree of Autonomy" (Academic, Administrative and Financial autonomy) available to an institution and the "Quantum and quality of its achievements".

An ideal polytechnic will be guided not only by its MANDATE – i.e. what it must do as directed by the legitimate higher authorities, but also by a Mission Statement. Mission refers to what the organisation wishes to do and become within and beyond its Mandate.

The Mission statement indicates organisational purpose, the general services it will provide to respond to the needs of its stakeholders and the core values. A sample Mission Statment developed by a team of Principals of Polytechnics and Educational administrators associated with the Canada India Institutional Cooperation Project is given below:

MISSION STATEMENT

THE POLYTECHNIC PROVIDES HIGH QUALITY, EQUITABLE, AND ACCESSIBLE TRAINING AND EDUCATION TO CONTRIBUTE TO THE ECONOMIC AND SOCIAL DEVELOPMENT OF THE SOCIETY.

SPECIFICALLY, IT SERVES THE HUMAN RESOURCE NEEDS OF INDUSTRY, BUSINESS AND THE SOCIETY THROUGH DYNAMIC POST – SECONDARY, CONTINUING AND NON-FORMAL EDUCATION AND TRAINING PROGRAMMES THAT RESPOND TO RAPID TECHNOLOGICAL AND SOCIAL CHANGE.

THE POLYTECHNIC STRIVES TO ACHIEVE THIS MISSION WITH A DEDICATED AND COMPETENT STAFF IN AN APPROPRIATE LEARNING ENVIRONMENT.

Organisational Structures

(1) Governing Body

The ideal polytechnic will have a governing body consisting of representatives of its stakeholders i.e., representatives from Business, Industry, Community and Staff.

(2) Strategic Planning Group

This group will act as a "Think tank" and plan strategic directions for the total development of the institute.

(3) Programme Advisory Committees

There will be one programme Advisory Committee for each of the long term programmes offered by the polytechnic.

Policies

An ideal polytechnic will have well formulated policies regarding.

- Staff Recruitment

- Performance Appraisal

- Staff Development

- Selection and Admission of Students

- Programme Development, Implementation and Evaluation

- Student Service

- Purchase of Equipment, and Other Instructional Resources

- Maintenance of Buildings, Equipment and Other Services

- Financial Management including Resource Generation and its Utilisation.

2. Relationships and Linkages with External Agencies

Linkages with external agencies are essential for the effective functioning of a

polytechnic. The linkages could be used for forming partnerships, strategic alliances and networks and for sharing of resources.

Linkages with Industries and Business

These linkages will facilitate the following:

1. Development of need based curricula and programmes

2. Development of appropriate learning resources

3. Training of Staff and Students

4. Placement of Students.

Linkages with Community

This could be established by offering need based programmes and services to the people in the neighborhood area. Community Polytechnic Scheme sponsored by Government of India is a very useful mode for this type of linkage.

Linkages with Professional bodies

An ideal polytechnic will have active linkages with organisations like TTTI, ISTE, Institution of Engineers, Confederation of Indian Industries (CII) and AICTE.

3. Programmes and Services

A variety of Programmes and services will be offered by an Ideal Polytechnic. An illustrative list is given below.

1. Long term programmes leading to the award of Dipoloma, Post Diploma and Associate Degree.

2. Need based Continuing and Non Formal Education and Training to employed persons and unemployed youth.

3. Consultancy services.

4. Testing services.

5. Equipment Repair and Maintenance services.

As the Ideal Polytechnic will have the necessary academic autonomy it can

- Develop curricula which are tailor-made to suit the specific needs of community/sectors of industry.

- Deliver the programmes through a variety of modes and at work place/Industry.

- Use a variety of Instructional materials, media and learning resources.

- Adopt a variety of student-centred instructional methods.

- Follow a criterion referenced system for evaluation of students' performance instead of the conventional norm referenced evaluation.

4. Students

- Adoption of Multi Point Entry and Credit system will enable the Ideal Polytechnic to provide flexibility to students with different entry standards.

3

- Special incentives will be offered to increase the enrolment of women and to promote gender balance.

- Guidance and counselling services will be offered to promote the Social, Emotional and Career development of students.

- "Learning to Learn" skills and Personality development programmes will be offered to students.

- Sports, N.S.S., N.C.C. activities will be organised to facilitate the all round development of students.

- Data pertaining to employment of past students will be maintained through Student Follow up services.

- An alumni association will be actively functioning.

5. Staff

The ideal polytechnic will

- Have full complement of Sanctioned staff, besides a number of staff on contract for offering Continuing Education Programmes.

- Have competent and motivated staff who will be willing to try innovative practices.

- Use a Valid and Reliable Performance Appraisal system

- Have a need based system for the training and professional development of all categories of Staff – Principal, Teachers, Supporting Staff (Technical, Administrative and General)

- Involve the staff in the planning and development of the Polytechnic.

6. Physical Facilities

The Physical facilities like Buildings, Classrooms, Furniture, Equipment, Workshop Machineries, Library Resources, Teaching Aids, Computer facilities, Hostels and Transport facilities in an ideal Polytechnic will match the norms specified by the AICTE.

It will have a well developed Management Information System which will be upto date. So it will be able to quickly respond to requests of specific data (by State or Central Governments or other agencies.)

Comparison of a Typical Existing Polytechnic with an Ideal Polytechnic

The conditions presently existing in a typical polytechnic are compared with the desired characteristics of an Ideal Polytechnic in Table-1.

Guidelines for Polytechnics to Achieve Idealness

A typical polytechnic has to create appropriate organisational structures, systems and procedures and linkages for achieving idealness. An illustrative list of guidelines are given below:

1. A strategic Planning Group
   This group will conduct SWOT Analysis periodically and update/revise the thrust areas and strategies.

TABLE-1: COMPARISON OF A TYPICAL EXISTING POLYTECHNIC WITH AN IDEAL POLYTECHNIC.

	ASPECT COMPARED	TYPICAL POLYTECHNIC	IDEAL POLYTECHNIC
1.	Management Style	Authoritarian	Decentralised
2.	Policies	Ambiguous	Clear and understood by all
3.	Autonomy	No autonomy (Govt. controlled)	Will have Academic, Administrative and Financial autonomy
4.	Linkages with Business, Industry and Community	Weak	Strong
5a.	Curriculum development and Curriculum revision..	Follows a Delayed Response Mechanism	Follows a Quick response mechanism
5b.	Nature of the curriculum	Subject Based	Competency and Need based
5c.	Curriculum Focus	High Knowledge orientation	High skill Orientation
6.	Continuing Education Programme	Ranges from Nil to very few	Very large number and variety of programmes.
7.	Consultancy and Testing services	Few	Significant
8.	Enrolment of Women Students	Low	High
9.	Student services	Very few	Large No. and Variety of services
10.	Follow up of Past students.	Not systematic	Systematic
11.	Alumni Association	Not functioning/very passive	Active
12.	Vacant staff positions	About 30%	All vacancies filled in + 10% training reserve
13.	Performance Appraisal.	Not systematic	Systematic
14.	Staff development programmes	Very few	Need based programmes for all categories of staff.
15.	Physical facilities	Inadequate and poorly maintained	As per the norms prescribed and well maintained
16.	Sensitivity to issues of Enviornmental Development	Low	High
17.	Management of Information system	Cannot respond quickly to information requests	Can respond very quickly

2. Industry – Institute Interaction Centre along with Programme Advisory Committees.

3. Community Polytechnic Scheme

4. Curriculum Development Cell
   To formulate need based and competency based curricula.

5. Learning Resources Utilisation Centre

6. Continuing Education Centre

7. Performance Appraisal System for staff

8. Planned Staff Development activities

9. Women in Development activities
   For the development of women students, women staff and Women in the community.

10. Environment Develpment activities

11. Equipment Repair and Maintenance Cell.

12. Linkages with Professional bodies like TTTI, ISTE, AICTE, Institution of Engineers.

13. Generation of revenue by utilising the existing resources.

14. Utilisation of the revenue generated for the development of the Polytechnic.

15. Adoption of Multipoint Entry and Credit system.

16. Guidance and Counselling Services for students.

17. Well laid out Policies.

In short the programmes offered by the Ideal Polytechnic will be need based and Skill oriented rather than knowledge loaded.

Conclusion

An attempt has been made in this paper to raise a number of issues which require careful consideration and formulation of specific courses of action by Central Government (AICTE and MHRD) State Government, Regional Organisations like TTTI and individual Polytechnics. It is hoped that many polytechnics will take the initiatives necessary to become ideal institutions.

FACULTY ACCOUNTABILITY, A CANADIAN PERSPECTIVE

BARRIE J. SAXTON

ABSTRACT

The need for teachers to receive feedback from learners and the Head of the Department is important. The author also feels student assessment of teachers is a controversial issue in Indian Context. The author tells this process is useful in ensuring professional accountability which is emphasised in the present paper.

Introduction:

The teaching profession at any level is one which can be full of rewards and satisfaction for those who practice it conscientiously. What can be more rewarding than to be visited by a former student who tells you what a profound influence you had on him or her during the courses s/he took with you. On the other hand, teaching is a profession which can easily be abused by the less scrupulous individual. It is also a profession which has received much criticism in North America because of falling standards over the past twenty years. In some American states, legislation has been passed requiring mandatory "re-certification" tests every five years for teachers. I'm not sure what good it has done except perhaps to keep the taxpayers off the politicans backs. Nevertheless, like other citizens who are being paid to do a job, faculty members should be accountable for what they do. For those people who are involved in University research and publication the result of their work will speak for them. This paper is more concerned with faculty who are essentially teaching students at the post-secondary level.

The process I am about to describe is one which should be non-threatening to the teacher. It involves the teacher in receiving feedback from significant others, namely students and the department head. It also involves the teacher in discussing the feedback and using it as a platform for professional growth and development with institutional support. If properly administered, this method can be an ongoing vehicle for faculty to work with their immediate supervisor in order to plan their professional development and to maintain their currency and relevance in their subject area.

The system requires commitment on the part of the institution and its administration. It involves four major phases and takes about one academic year to complete the cycle. It is a process which I and many of my colleagues at Humber College, Toronto, Canada have practiced successfully for many years.

Phase 1: Student Evaluation of the Teacher.

The notion of students evaluating teachers may be a somewhat controversial issue in the Indian context. Not so in North America. In Canada for example, even though college and university faculty have very strong unions the tradition of students evaluating faculty has been an accepted practice for more than twenty five years. After all, students are the clients and they are paying tuition fees for their education they should have a right to express an opinion on what they are paying for. It is worthy to note that the Mehrotra Committee recommended that students be allowed to evaluate teachers in Indian colleges and universities.

"The Mehrotra Committee recommended that a reliable and credible system of evaluation of teacher performance by students should be worked out carefully and meticulously and no less important, enforced gradually and effectively."[1]

Of course it is not likely that a first year student will be able to offer a lot of criticism on course content. Although it may be useful for the college teacher to know that the local high school Physics curriculum might start to overlap with first year Polytechnic courses. Students can offer a lot of useful feedback in other areas with regard to the teaching/learning process.

In general the questionnaire should cover such areas as the following:

* The Course

    * The learning outcomes were clearly stated

* The required text books were used appropriately

* Handouts given in the course are useful for my learning

* The amount of material covered in the course is enough

* The computer software used in the course is useful

The Professor

* The professor is knowledgeable in the subject area

* The professor is prepared for class

* The way the professor teaches helps me learn

* The professor gives me feedback to help me improve weak areas

* The professor shows concern for my progress

* The professor enjoys teaching the subject

* The professor explains ideas clearly

* The professor uses words I can understand

* The professor is an approachable person

This is not a definitive list and many more questions should be asked.

The answers can be multiple choice, for example SA = strongly agee, A = agree D = disagee, SD = strongly disagree.

Questionnaires should be anonymous and should be administered by a class monitor. The monitor should seal the questionnaires in an envelope and hand it to the H.O.D. for a

computer scan. The teacher should be absent from the classroom whilst students are completing the questionnaires. A summary of the responses to the questions should go to the H.O.D. and the original questionnaires to the teacher. Providing there are no glaring problems which require immediate attention, this evaluation will be discussed later at a meeting between Head of Department and teacher.

Phase 2: Class Visit by the Head of Department:

The teaching learning process is a very serious one and is the major reason for the existence of most institutes of learning, notwithstanding the research and development component of some Universities. It necessarily follows then that pedagogical expertise is a critical skill for the faculty and an area for observation and assessment by the H.O.D. As a manager in a so-called "service organisation", the H.O.D. has a responsibility to ensure that the "quality" of the service is of a high standard. The face-to-face interaction between teacher and student can only be observed by the H.O.D. going into the classroom to monitor the process.

Every teacher, no matter how much seniority and experience they have should receive at least one class visit each academic year by their H.O.D. In the case of new teachers, they should be observed teaching at least twice a year during their first two years. If there appear to be any problems then more frequent visits, counselling and support will be necessary. The visit can be by appointment with the mutual consent of the teacher or it could be spontaneous at the initiation of the H.O.D. During my many years as an academic administrator I have tried both techniques and

have never had a complaint from a teacher. I have also been pleasantly surprised how well prepared many teachers are, even when they were not expecting me to visit their class. The following are some of the areas which the H.O.D. should be observing and making notes on during the class visit:

Subject/content

* Teacher's knowledge of subject

* Teacher's adhered to lesson plan

* Teacher's adhered to the course outline

Instructional Delivery Skills

* The lesson objective was clearly stated

* The teacher related this class to previous classes

* Examples were used to clarify abstracts

* Teacher presented alternate views

* Teacher used appropriate A/V or other support materials

* Major points were summarized

* Material presented was up-to-date.

* Material was presented in an organized manner

Class Environment

* The teacher displayed enthusiasm for teaching

* Teacher captured the student interest

- Student participation was encouraged

- Teacher answered questions posed by students

- Teacher stimulated constructive ideas

- Teacher showed respect for students

The H.O.D. can use this type of check list to standardize the process for class visits with all of his or her teachers. As well, the H.O.D. can use a grading system for each point and mark it, fair, average, good, excellent etc.

Following the class visit a written report should be prepared by the H.O.D. S/He should then interview the faculty member and provide some feedback regarding what was observed during the class visit. As well, a written report should be provided to the teacher and a copy placed in his or her personal file. This report will also be used later as part of the annual assessment of the teachers total performance.

On the whole, once they have overcome the initial "stage fright", most teachers enjoy having the H.O.D. visit their class. Teachers have said to me, "At least you show an interest in what I am doing". It is a form of recognition which can only act as a motivator for most people. They also enjoy the feedback and reinforcement of the positive aspects of the post-visit comments. In the case of new teachers they are usually "thirsting" for information and tips on how they can improve their instructional skills and welcome the suggestions from an experienced educator on how to be a better teacher.

Phase 3 The Annual Performance Review by the HOD:

Any good interview begins long before the two parties sit down face to face. An annual review of a teacher's performance certainly requires some serious thought and preparation. First, the time and date should be mutually established. The location should be private and the time frame should be at least an hour and preferably open ended. There is nothing more frustrating for either party than to have to break off a serious discussion because of having to rush away to another appointment. The teacher should be invited to bring along his or her self appraisal on the previous year's performance along with any supporting documents. The teacher should also be prepared to discuss what steps she/he has taken during the past year to develop him or herself professionally.

The H.O.D. should be well prepared for the interview if it is to be thorough and effective. The kind of information and documents to be reviewed prior to the meeting are as follows. First, the student feedback summary report should be carefully analyzed to identify the teacher's strengths and weaknesses from the perspective of the students. Secondly, the H.O.D's class visit report should be reviewed to refresh the memory of the HOD regarding his or her observations and suggestions.

A third note which the H.O.D. should make for discussion during the interview is a list of comments regarding the teacher's extra-curricula activities. That would include such things as the teacher's volunteer involvement in Polytechnic committees, student societies, sporting activities and student counselling. In other words is this teacher motivated and interested in doing more

than just the minimum performance. Does this teacher demonstrate any leadership skills by taking initiatives to organize a field trip or helping students to find a job or making contacts with local industry.

Armed with all this information, the HOD is now ready to commence the interview. Remember always that the goal of this interview is to assist the teacher to improve their level of performance. Remember always that an interview involves two way communication. The H.O.D. should comment on those things which are tangible and the dialogue should focus on how to capitalize and build on the teacher's strengths and how to help him or her to strengthen areas of weakness.

Phase 4 The Professional Development Programme for the Teacher:

As the interview progresses it should become apparent from the discussion and input from both parties where the teacher may need some help to improve his or her level of performance. It may be in the area of pedagogical skills. The students may be bored because the teacher is using only the lecture technique for teaching. So a programme of developing skills in alternative instructional techniques may be appropriate for the teacher to embark upon. It may be that the teacher identifies a new development in their subject area which is now being used in industries which employ graduates. Then, a short course or on-the-job training programme should be arranged to bring the teacher's skills up to the leading edge. A major concern in technical education is the rapid change on the shop floor which might overtake the teacher's current knowledge. Faculty "renewal" to keep them current and relevant with industry needs is critical to the credibility of both the teacher and the institution.

So, the final part of the interview should be a mutual agreement on a professional development programme for the teacher to pursue during the next twelve months. Two or three specific goals should be stated and the achievement of these goals will be a subject of discussion at the subsequent year end performance appraisal.

Conclusion:

As the reader can see this process is one which ensures professional accountability by faculty for their teaching performance. More important though is the fact that it helps the faculty member to grow professionally. If followed on a ongoing basis the procedure is iterative and should take the teacher from strength to strength. So the ultimate end result is a win-win situation. The faculty is a winner because he or she is a competent well respected teacher. The students are winners because they receive excellent instruction from a well qualified educator. The institution is a winner because it is producing well qualified graduates whose training is both current and relevant.

REFERENCE

Singh, Amrik. The Rastogi Committee's Task. The Hindu. October 14, 1996.

THE ANALYSIS OF PLASTIC INJECTION MOLD SKILL CONTENT IN TECHNICAL AND VOCATIONAL EDUCATION IN TAIWAN

TIEN CHEN-JUNG & TANG CHIN LUNG

ABSTRACT

The study aimed at finding out the skill content for plastic injection mold worker, and the skill which is suitable to be taught in senior vocational high school, junior and senior technical college by investigation. Document analysis, on-the-job investigation, Delphi technique, and questionnaire investigation were employed in the study. The consequence of the analysis from the three levels of plastic injection mold design, maintenance and manufacturing which should be possessed by the workers has great worthy to the development of the curriculum, purchasing the equipment and the plan of human resource for plastic injection mold worker.

Introduction

Plastic Injection Mold (abbreviated PIM) is an important producing tool and its precision will expect the quality of the production. Mold industry also impels the development of its related industries. Because of skill concentrated instead of the labour in the industry in Taiwan, all productions should be automatically. And the prerequisite of automation is to develop the tooling, such as jigs, fixtures, press die, PIM...etc. If Taiwan intents to cast off the dependence from other countries, developing the market and increasing the competitiveness, should start from mold industry and stipulate it as a strategical industry (Taiwan institution for economic research, 1993).

Over the past 40 years, the efforts in vocational education has great contribution to the development of economics in Taiwan.

However, the environment is changing with the improvement of technology. Thus, the training of skill, the supply and demand for human resource should be developed by the vocational education conforming with the needs of the industry. The purpose of the education is to train the qualified technicians. Therefore, what is taught in school should conform with the industry, basing on its feature, and do the market investigation and trade analysis (Lee and Wang, 1989). In other words, only perfect plan could train qualified personnel and develop its function.

Analyzing present situation, the first three problems for plastic mold makers are the recruit of the personnel, the training of the technicians and the shortage of design personnel (Research institute of machinery industry Taiwan, 1993). Thus, it is an important task to do an effective analysis and

research of the skill content and the industry and enterprise could train the manpower in PIM manufacturing.

For understanding the skill needs to the workers and finding the systematic curriculum of PIM, the study has following purposes:

1. synthesizing the skill content of PIM industry.

2. exploring the suitable PIM skill content which is taught in technical schools.

Research Design

Research Method

PIM skill content was gathered by document analysis, on-the-job investigation, Delphi technique and expert panel discussion in the study of the suitable PIM skill teaching content was analyzed by questionnaire.

Research Scope and Limitation

1. The first purpose of this study.

There are four levels of technical field: Research and Development (R and D), design, maintenance and manufacturing (King, 1966). In Taiwan, the PIM skill training and courses mainly emphasized in design, maintenance and manufacturing. So, the skill content of this research covers mainly in the skill level of design, maintenance and manufacturing.

The operator who basically learned how to make component parts of mold and assemble the mold on the job, or operate the plastic injection machine are referred to on-the-job training in the companies. They are not covered in this study.

2. The second purpose of this study.

There are only few schools that have the PIM programme in Taiwan and all of them are covered in this study. They are; a) the mold department in senior technical high school b) the mold industry department in two-year or five-year junior colleges c) the machinery and chemistry related departments in institute of technologies.

The training centres are not included in the regular education in Taiwan, and they are not covered in this study.

The Development of Tool

Two kind of tools were used in this study, they are skill checklist and questionnaire which have tested content validity by a panel of experts. It is described as follows:

I. Content of the Skill Checklist

The "Skill Checklist Draft" is comprised of plastic mold training courses from different sources, such as:

1. Standardized plastic mold courses for vocational technical high schools and two-year and five-year junior colleges by the Ministry of Education (Ministry of Education, 1986)

2. The skill and on-the-job training course to plastic mold makers by Vocational and Job training centre (Vocation Training Bureau and Council of Labour Affair by Executive Yuan, 1987).

3. Canada apprenticeship plastic mold training courses (Ministry of skill development, 1991).

4. U.S.A., Texas industrial technical courses (Texas higher education coordinating board, 1988).

5. The training courses to mold makers in Germany vocational school (Der Kultus Minister des Landes Nordrhein-Westfalen., 1989).

6. The mold courses of East Japan plastic molding industrial association (East Japan molding industrial association, 1990).

After reviewing all the technical courses listed above, they were summarized into six categories and used as the basis for developing skill checklist. They are:

1. Design·skill 2. Maintenance skill 3. Manufacturing skill 4. Computer assistant application. 5. Quality control 6. Product design and molding skill.

Technician should use equipment tools, materials by declarative knowledge and procedural knowledge to finish the production (Hong, J.C. 1992:1994:1995). Therefore all these items in six categories were presented to the plastic mold companies, after on-the-job investigation, the skill checklists were set up through the two runs of panel discussion.

II. Questionnaire of Suitable Skill

The questionnaire of the needs of the suitable skill content to PIM worker was developed on the basis of skill items that acquired from checklist.

Research Subjects

The main selected purposeful subjects to run Delphi technique for skill checklist are design and manufacturing engineers in seventeen companies of 384 members in "Taiwan Molding Association" from 1993 to 1994, including subject selective condition such as: choosing from sixteen different product categories; having set up a company for more than five years; having capital money for more than eight hundred million dollars and having more than twenty employees. Beside these subjects, seven purposeful subjects are chosen from the members that mentioned above and presented them as experts for the panel discussion.

The research subjects to questionnaire includes two groups, which are school teachers and technicians in plastic mold industries. The total subjects are 153. The questionnaires were sent by mail, and it had 82 return after 3 times follow up by phone. The total return is 58.99%. The two group of subjects are recounted as follows:

(1) The first group (school teachers):

There are seven senior vocational schools and one junior technical college which has tooling or molding department in Taiwan. All of them are taken to be the objects, and each of them has two questionnaires.

(2) The second group (technicians in plastic mold industry):

There are 384 members from sixty companies who have the same requirements as mentioned above, (in "Taiwan molding association" from 1993 to 1994, are chosen in this study) and each of them selected two technicians as the objects. Besides, adding 17

panel experts, the questionnaires in the second group are 137.

Statistical Analysis

Quartile deviation was used for the skill checklists in Delphi technique. If the score goes beyond the third quartiles, the skill should be selected. On the contrary, if the score doesn't go beyond the third quartiles, the expert should explain the reasons for what they thought and why they insisted in their opinion.

The Frequency, Chi-square and Fisher's exact probability test were used for the different opinions between schools and companies in·suitable·skill content.

CONCLUSION

The Result

According to the design research, the skill content of each level is acquired, and the skill content is used as the basis of suitable teaching content for each level of schools. The main result is represented as follow:

1. The skill items for PIM workers in each level are:

(1)Through panel discussion the skill items are defined, and the relation map of the skill items is shown as figure 1.

a) There are 11 job items and 58 skill items in design level.

b) There are 7 job items and 43 skill items in maintenance level.

c) There are 13 job items and 171 skill items in manufacture level.

(2) The main skill content of PIM design level is structuring design, which is processed by computer.

(3) The utilizing of the software in PIM are focused on the analyzing of the plastic productions, but the design of plastic production is always done in the development and research centre in Taiwan. Thus, the frequency of the utilizing of the software in design level is becoming lower.

(4) The maintenance skill is emphasized on changing and separating parts, and mold maintenance. So, the skill in machining could be neglected or reduced to maintenance worker.
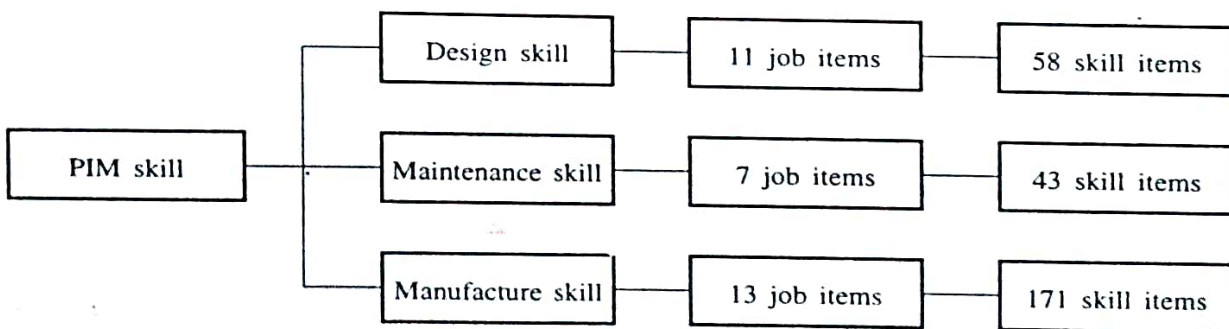
Fig. 1 The Relation Map of Skill Items

(5) The manufacturing skill in PIM is almost the same as the skill of the machine shop. Only the worker has the concept in mold structure and the worker can manufacture the PIM.

(6) Although the parts to PIM already has been standardized in TAIWAN, and the machining shop can support the manufacture in molding parts, the PIM manufacturing worker should have the basic skill in machining and assembling.

(7) The curriculum of personal safety and machinery maintenance should be covered in order to keep the safety when machining and assembling.

2. The suitable teaching skill content to each level in technical schools is discussed as follow:

(1) The content of skill items which are unsuitable to school teaching are 9 items of design skill, 12 items of maintenance skill and 34 items of manufacturing skill (as table 1) and its unsuitable factors focuses on the lack of equipment and the needing of experience. The opinions to the suitable teaching skill from the two groups are listed in table 2.

Table 1. The Frequency Of Unsuitable Teaching Content

Level	Design	Maintenance	Manufacture
Frequency	9	12	34

Table 2. The Reasons And The Percentage Of Unsuitable Teaching Content

Level / Reason	Design	Maintaining	Manufacture	Unsuitable content
Lacking of Equipment	11.2%	16.8%	48.4%	1. Heat Treatment 2. Surfacing 3. Hot Runner 4. Temperature Control 5. Plastic Production 6. Post Machining for Plastic Production 7. Optical Measurement
Lacking of Instruction Material	12%	6.8%	8.8%	1. Quality Control 2. Special PIM
Skill Level is too High	6%	2.5%	3.1%	
Experience Needed	68.1%	71.9%	33.7%	1. Heat Treatment 2. Surfacing

Level Reason	Design	Maintaining	Manufacture	Unsuitable content
				3. Installing and Adjustment in Hot Runner
				4. Temperature Balancing
				5. Trouble Shooting
				6. Assembling in Gear Set
				7. Adjusting in Injection Machine
Lacking of Instructor	2.7%	2%	6%	8. Slider Setting
Main Unsuitable Items in Level	Focus on: 1. Trouble Shooting	Focus on: 1. Slider Setting 2. Adjusting Clamping pressure	Focus on: 1. Post Machining for Plastic Production	
Different Opinions to the Skill Items Between two Groups	None	None	1. Surfacing 2. Assembly and 3. Adjusting in Hot Runner 4. Screw Temperature Control 5. Trouble Shooting 6. Gear Set 7. Slider Setting and Control	

(2) The PIM skills which is suitable for the teaching in school are changing along with different skill levels. The information from the questionnaire of this study is explained as following:

a) The percentage of suitable teaching skill items in each level are shown in figure 2.

i) The percentage of suitable teaching skill item is 82% of manufacturing in senior technical school, 15% of manufacturing in technical junior college, 3% of manufacturing in technical institute.

ii) The percentage of suitable teaching skill item is 75% of maintenance in senior technical school, 20% of maintenance in technical junior college, 5% of maintenance in technical institute.

iii) The percentage of suitable teaching skill item is 23% of design in senior technical

School Levels		Technical Institute		Junior College		Senior Technical School
Skill Level	Design	24%		53%		23%
	Maintenance	5%	20%	75%		
	Manufacture	3%	15%	82%		

Fig. 2. The Percentage of Suitable Teaching Skill Items

school, 53% of design in technical junior college, 24% of design in technical institute.

Discussion

Here are the consequences analyzed in this study:

1. The lack of equipments and the need of experience are the two main reasons which are not suitable for school teaching in each level skill in Taiwan. The possible factors are:

(1) In design skill level:

The apply and calculation of hot-runner and trouble shooting in design skill are not suitable to teaching content. The possible reasons are the capability in selling the plastic products in the domestic and overseas markets is becoming weaker, the opportunity of producing a large amount of plastic products and the use of hot-runner in mold industry are relatively less. Consequently therefore, there is lack of experience.

(2) In maintenance skill level:

The maintenance skill of the plastic mold is not suitable for the curriculum of the adjusting the plastic injection machine, mold assembling on the injection machine or adjusting the hot runner controller. Because

the equipment standard required in college excludes the plastic injection machine and the time of lecture is few in senior vocational school, because the curriculum is arranged in second semester of the last year.

(3) In the manufacture skill level:

The manufacturing skill of the plastic mold is not suitable for the curriculum of a) the adjusting the plastic injection machine, b) adjusting the hot runner controller, c) heat treatment, d) engraving and e) post machining for plastic products. This is because the kinds of equipment are professional machines for special aim and is expensive.

2. The prior sequence of PIM skill curriculum arrangement to the each level of schools is as follows:

(1) In design skill level:

According to the majority of investigation, design skills are suitable for the teaching in junior college in first priority, second priority is taught in technological institute. It's not suitable for the teaching in senior vocational school. So it's proper to arrange the curriculum in prior consideration in junior college.

(2)In maintenance and manufacture skill level:

It is suitable for the teaching in senior vocational school first, second in junior college. It's not suitable for the teaching in technical institute. So, it's proper to take senior vocational school in prior consideration when arranging the curriculum.

(3) According to the majority of investigation, the skill of testing and computer data dealing are suitable for the teaching in junior college, and in senior vocational school. It's not suitable for the teaching in technological institute.

3. Here are the benefits in this study:

(1) After listing the content of each level of skills by study, it will offer great help to the planning of plastic mold skill curriculum in Taiwan.

(2) The skill content which is needed by each level skill in this study will get the consistency horizontally and vertically. Moreover, it could avoid the redundancy of teaching in skill levels.

(3) By the skill content in this study could develop the PIM skill teaching materials systematically and practically. Besides, by analyzing the needed equipment from skills in this study could also offer the reference to invest the teaching facilities.

SUGGESTIONS:

Here are the suggestions after the investigation:

1. Although the school cannot cultivate all-round students, the students need to learn the basic concept and skill in school.

2. The overlapping teaching of different levels should be considered with planning the curriculum.

3. The investigation of the skill on plastic production should be eliminated from PIM skill.

4. In training of the PIM maintenance skill, pay more attention to the theory of electricity.

5. The relation between PIM skill and cylindric grinding skill is less, it would be considered to reduce the teaching hours in cylindric grinding.

6. The skills of welding are suggested to be processed by professional factories in PIM field, and the teachers could just teach the basic welding skill.

7. The post processing or machining on plastic products are suggested to teach by visiting in factory. It's not necessary to teach in school.

REFERENCES:

1. Der Kultus Minister des Landes Nordrhein–Westfalen. (1989) Ver laeufiger Lehrplan die Berufsschule Werkzeug mechaniker. [The Training Plan for Mold Maker] Neuordernung der Industriellen Metallberufe.
2. East Japan Molding Industrial Association. (1990). Practice for plastics injection Japan: Tokyo.

3. Hong, J.C. (1992; 1994). The study of knowledge acquisition on industrial occupation. Taipei, Taiwan R.O.C. (NSC 82-0111-S-003-054)

4. Hong, J.C. (1995). The study of knowledge analysis on industrial occupation, Taipei, Taiwan ROC (NSC 84-2511-S-021 Th).

5. King, H. (1966). The contribution of technical education, in Pan Indian Ocean on technical education and training conference report, Perth 1986, p21-p29.

6. Lee, D.W. and Wang, C.M. (1989). The theory and practice of the development of the curriculum in technical education. Shie-Yan Book, Taiwan Taipei R.O.C.

7. Ministry of education R.O.C. (1986). The standard of curriculums and educational facilities for technical high school in Taiwan. Taipei, Taiwan R.O.C.

8. Ministry of skills development, communications and marketing branch. (1991). Mould maker apprenticeship training standards. Canada: Toronto.

9. Research Institute of Machinery Industry Taiwan. (1993). The analysis of production and distribution for plastic injection machine in Japan, 145-148. Taipei, Taiwan. R.O.C.

10. Taiwan Institution for Economic Research. (1993). Mold and tooling industry machinery year book 1993. p223-p237. Chain-Hwa Book, Taipei Taiwan R.O.C.

11. Texas Higher Education Coordinating Board. (1988). Curriculums in industrial technology. Plastics technology, Industrial maintenance, Computer numerical control. Teacher's manuals and student learning guides. EL Paso Community Coll., Tex. Austin.

12. Vocational Training Bureau and Council of Labor Affair by Executive Yuan, (1987). On the job training course. Taiwan, Taipei.

WOMEN PARTICIPATION IN TECHNOLOGY EDUCATION IN NIGERIA: A STUDY OF THE SOCIO-CULTURAL IMPEDIMENTS

U.J. AFUGBUOM

ABSTRACT

Technology Education is a vital instrument for technological development in Nigeria since it encourages the acquisition of technological skills.

The low enrolment of women in Technology Education in Nigeria and world over has been attributed to the society and its culture.

This study aimed at identifying the socio-cultural impediments to effective participation of women in Technology Education.

Introduction

Technology Education is a comprehensive action-based education programme concerned with technical means, their evolution, utilization and significance with industry, its organization, personnel, systems, techniques, resources and products, and their social and cultural impact (Eyibe, 1994). According to the National policy on Education (1977) it should lead to the acquisition of practical and applied skills as well as basic scientific knowledge. The essence of Technology Education therefore, is to produce trained manpower who should be self-reliant and self-sustained. Since the world today is a technological village and many operations depend heavily on science and technology, the women who are the backbone of rural development in Nigeria (Afugbuom, 1994) should be active participants.

In Nigeria, Technology Education is usually acquired in the Universities, colleges of technology, colleges of Education (technical), Institutes of computer and management studies, Institutes of catering and hotel management, schools of fashion and designing, craft-centres, technical colleges, secondary and commercial schools.

A critical look at the enrolment and performance of students in these institutions will highlight a low rate of women participation in Technology Education. Efforts have been made by both the Government and the Nigerian Association of Women in Science, Technology and Mathematics to award scholarships and organize workshops for girls to motivate them to study science and technology courses and programmes.

Euler-Ajayi (1989) and Onyejemeze (1991) a research findings depict low

21

enrolment of women in science and technology courses and programmes despite these efforts. Could the low enrolment of women in Technology Education be attributed to the society and its culture?

Objectives:

This study aims at identifying the socio-cultural factors that impede the effective participation of women in Technology Education and makes recommendations based on the findings of this study for the enhancement of women participation in Technology Education.

Research Question:

What are the social-cultural impediments to the effective participation of women in Technology Education?

Methodology

Fifty students of Federal Polytechnic, Oko were randomly selected and used for the study.

A 10 – item questionnaire validated by some lecturers in the school was administered on the students selected.

Rank-order was used to answer the research question.

Findings:

An analysis of the data collected on the research question show that:

- Multiple responsibilities of women ranks first as the major impediment.

- Non-availability of financial resources to women ranks second.

- Prejudices of discrimination against women ranks third.

- Few women in science and technology to serve as models ranks fourth.

- Family pressures on the women ranks fifth.

- The life-style of the people eg. Nomads, Fishermen in riverine areas ranks sixth.

- Family upbringing of women ranks seventh.

- Inability of most women to read and write ranks eight.

- Poor technical ability of women folk ranks ninth, while

- Women see science and technology as a "man's field" ranks tenth.

Recommendations

Serious changes in science and technology resulting from changes in knowledge, discoveries and experience of individuals (Afugbuom, 1995) calls for serious emphasis on planning, implementation and supervision of Technology Education. The women make up more than 50% of the total population and work force, and constitute the backbone of rural development in Nigeria, therefore their education in Technology should be of primary concern to the Government and the general public.

Table I
Rank Order of Socio-Cultural Impediments to Effective Participation of Women in Technology Education.

	Question Item	Rank Order
1.	Multiple roles of women	1
2.	Women run against prejudices of discrimination which will take time to break down.	3
3.	There a few women in science and technology-based disciplines to serve as models.	4
4.	Poor technical ability of women	9
5.	Family Pressures.	5
6.	Inability of Women to read and write.	8
7.	Non-availability of financial resources to women.	2
8.	Women see Technology Education as "man's field".	10
9.	Family upbringing.	7
10.	Unsettled lifestyle of some groups in the country.	6

1. Women education should be encouraged at all costs. More Women Education Centres should be established, properly equipped and managed by experts on Women Education. These centres should organize conferences, seminars and workshops on regular basis for the proper acquisition of technological skills that will make our women self-reliant and self-sustained.

2. The Federal and State Government should increase their budgetary allocations to Technology Education so that the provision of infrastructure and resource materials will help to make the programme more practical and achievement-oriented.

3. Multinational organizations, finance houses and industries should be compelled by Government to make both financial and non-financial donations to technological institutions to enhance effective teaching and learning of Technology. The non-financial donations come in the form of technology equipment and infrastructure to the schools concerned.

4. Scholarships should be awarded to girls to encourage them to take up Technology Education Courses and programmes. Women who acquired any form of Technology Education should be gainfully employed to encourage others.

5. Schools of Technology should have day-care centres, guidance and counselling units attached to them so that some of the family pressures which hinder the acquisition of Technology Education can be minimized.

6. Some of the laws of Federal Republic of Nigeria specifically and other

countries of the world which discriminate against women should be repealed so that the women are given equal opportunities with their menfolk.

7. A universal Technology Education for women is advocated to stem the tide of illiteracy.

8. Experts on Women Education should be encouraged and sponsored to publish books on Technology Education for women.

9. There should be a total change of attitude by the menfolk towards the women here in Nigeria and other parts of the world from subdividing the women and encourage them to aspire to greater heights.

Conclusion

Technology Education for women seems to be a solution to the present economic predicaments in Nigeria because of the multiplier effect it will have on the general population. Technology Education is step towards creating employment opportunities for the people through the acquisition of technological skills. The Nigerian Directorate of Employment Programmes for women, the school-to-land programme and the open apprenticeship scheme have produced women who are self-employed and self reliant. Greater efforts should be made towards achieving greater objectives. Technology Education courses and programmes should be adequately funded if the Nigerian Government places her priority right. Supplemental sources of revenue should be tapped so that there is a multi-organisational approach to the funding of Technology Education in Nigeria (Afuguom, 1994).

Technology Education should be co-operatively planned, implemented and supervised so that the concrete objectives of Technology Education as contained in the National Policy on Education (1977) is achieved.

REFERENCES

1. Afugbuom U.J. (1994) vocational agricultural education: the key to womens effectiveness in agriculture in Nigeria. Journal of Technical and Vocational Education. Madras 11.

2. Afugbuom U.J. (1994) Financing vocational technical education in Nigeria: Locating supplemental sources of revenue. A paper presented at the conference on "Social and Economic Implications of Vocational/Technical Education for Technological Development in Nigeria held at Umunze 20-23 April."

3. Afugbuom U.J. (1995) A study on students perception of in-service sandwich technical education programmes management in tertiary institutions in Nigeria. Journal of Technical and Vocational Education. Madras.

4. Federal Government of Nigeria (1977) National Policy on Education. Lagos: Government Press.

5. Onyejemezi in Ebo, B. (1992) Socio-cultural barriers to effective participation of women in technical development. A paper presented at the TEWAN Conference at Federal College of Education (Technical) Umunze. 15–18th May

TRAINING NEEDS IN EDUCATIONAL MANAGEMENT AMONG POLYTECHNIC PRINCIPALS AND HEADS OF DEPARTMENTS IN THE SOUTHERN STATES OF INDIA.

BIJU VARGHESE, P. ARUN KUMAR & B. MUKHOPADHYAY

ABSTRACT

Training in educational management through open learning system may be considered as a pragmatic and effective approach with a view to meet the pressing demand from some educational institutions in general and technical institutions in specific. In the present study an attempt has been made to assess the training needs of Principals and HODs in the area of educational management with a view to develop a comprehensive modular open learning programme for them. The findings indicated the priority area of training in educational management. The result may be useful for other organisations who are also engaged in conducting management development programmes for principals and HODs, in identifying training courses.

Management as an area of knowledge is well established among higher education disciplines, though Educational Management as a part of the broader discipline "Management" has enough scope to grow. The term Educational Management is generally used to include all forms of Education and Training for managers of educational institutions. Educational Management is different from "Management Education" that is provided in modern business schools, is that, the former thinks of services as an important goal and the latter considers profit making as its motive. The decisions that are being made about the content of Educational Management is shaped by conceptions of managerial work and of the changes that are affecting it as well as by views about the knowledge and skills that managers need.

In educational institution management in general is a common activity, with some differences between the job of managers at different levels. In India, administrative role in educational institutions is not carried by professionals with management background. The roles are taken by faculty mostly on the basis of seniority. Systematic avenues are yet to be initiated to train educational managers and administrators in India by developing various modes. Though initial attempts are made in the area of management training and development by National Institute of Educational Planning and Administration, Department of Education, SNDT Women's University. But they are mostly confined to management of education system in general, and compared to vast needs of a country like India they are insufficient. Training Principals

and HODs who are otherwise busy with academic and administrative work, through the contact mode would have been expensive and can reach only a few within a short time frame.

Alternatively, training in educational management through open learning system may be considered as a pragmatic and effective approach with a view to meet the pressing demand from educational institutions in general and technical institutions in specific. To develop any such open learning approach through modules, a need assessment has to be made from individuals in the clientele group, like principals, Heads of Departments and other prospective senior faculty who would be holding managerial positions in an institute. In the present study an attempt has been made to assess the training needs of principals and HODs in the area of educational management with a view to develop a comprehensive modular open learning programme for them.

Need assessment is an information gathering and analysis process which results in the identification of the needs of individuals, groups, institutions, communities and societies. The most widely used definition of need for needs assessment is that of a discrepancy. This suggests that needs are areas in which actual status is less than targeted status (Kaufman 1972). Targeted status has come to encompass ideals, norms, preferences, expectations and perceptions of what ought to be.

Because educational needs are based to a large extent on the values of the institution or society in which they are to be determined, procedures are expected to be incorporated into the process of need assessment to ensure that these values are represented. A preparation activity for these assessments is

the identification of those who will be involved in or affected by the study and the procurement of their commitment to participate.

Suarez (1981) observed that educational needs have been analysed for centuries but formalised assessment of educational needs were not conducted on a wider basis untill the middle of the twentieth century. When particular areas of educational needs are considered. needs assessment in few of the areas are yet to be conducted on widespread basis. One such area is training needs of principals and HODs where rarely any systematic needs assessment have been conducted in India.

Burgoyne and Stuart (1976) on their attempt to find out the knowledge and skills that a manager requires analysed the training needs. They identified ten hypothetical qualities of an effective manager. This study is considered as one of the most comprehensive attempt. Thus a need assessment and analysis can be conducted on the same line for principals and HODs who are the managers in educational system, and inservice courses on the basis of the need analysis can be developed. In the sub area of polytechnic education system, a management training programme series called "Distance learning for supervisors" was developed on the basis of analysis of training requirements of supervisors. The entire programme is being conducted at Bristol polytechnic, U.K.

In a different attempt Mukhopadhyay and Somasundaram (1993) conducted the need assessment of training for working technician who are the product of Polytechnic Education System in India. The study was conducted in 16 industries situated in Madras and Bangalore by inter-viewing working managers and technicians.

On the basis of the analysis of training requirements of principals working in five year technical schools in Cairo, a Management Development programme was initiated (Humphreys and Oxtoby 1995). The entire programme was conducted under the auspices of British Council.

METHOD

Sample

Purposive sampling technique was used in the present study. Forty two Polytechnics from four Southern states namely Karnataka (Number of Polytechnics, N.P. = 10), Tamil Nadu (N.P. = 10), Andhra Pradesh (N.P. = 12), and Kerala (N.P. = 10) were identified and each principal of the polytechnic was sent a bunch of 8 survey questionaire with a request to circulate among the HODs and faculty undertaking administrative responsibilities.

A total of 135 responses were received from Principals and HODs of the four southern states of which 59 from Karnataka, 47 from Tamil Nadu, 26 from Andhra Pradesh, and only three from Kerala.

Tool:

The tool used for data collection is based on the one developed by Burgoyne and Stuart (1976). They had listed down 10 qualities of an effective manager. The authors have developed further on the above qualities and added a few more based on our experiences in the field. The survey questionaire covered the following subareas of training.

1. Leadership

2. Decision Making

3. Group Behaviour

4. Motivation

5. Conflict Management

6. Values, Attitudes and Job Satisfaction

7. Stress Management

8. Perspective and Strategic Planning

9. Project Control

10. Total Quality Management

11. Organisational Change and Development

12. Career Development

13. Performance Appraisal and Development System

14. Transactional Analysis

15. State Rules Concerning Staff and Students

16. AICTE, Rules

17. Any other

The respondents were requested to give their order of priority after going through the above list. The seventeenth item gave them the freedom to express any other area not mentioned in the above list.

Procedure:

A bunch of survey questionnaire was sent to Principal of each sample polytechnic. He/She was requested to explain the need for responding to such survey to each faculty member responsible for administration. A special request was made to the principal of

each polytechnic to respond to the survey questionaire through careful analysis of the prevailing administrative and institutional climate vis a vis training needs of the HODs and senior faculty members. In some cases personal contacts were made to get the responses.

The responses thus obtained were categorised in order of preferences with respect to each management training area. For each area three preferences i.e., first preference, second preference and third preference given by each individual were considered for analysis and interpretation of results of the needs survey. Tables were prepared for statewise responses and combined responses of all the states together. Chi square was applied to see the difference of significance among major inter area preferences and highest response in the area of preferences. Thus major areas of training needs were found out along with their priority.

RESULTS AND DISCUSSIONS

The details of the preferences given by principals and HODs from all the states are presented in Table 1.

The maximum number of Principals and HODs preferred training in leadership (N = 40) as first priority. Thirty seven of the principals and HODs preferred training in decision making as first priority, 21 each in motivation and career development, 17 in total quality management and 14 in AICTE rules. Only one subject felt the need for training in transactional analysis. Moderately preferred areas were conflict management (N = 10), values attitude and job satisfaction (N = 10), state rules concerning staff and students (N=12). Similarly some of the principals and

HODs identified perspective and strategic planning (N = 9), organisational change and development (N = 8), and stress management (N = 7) as their first preference. Six principals and HODs in their priority of training needs identified training group behaviour as first preference and 4 principals and HODs identified training in project control, performance appraisal and development system as first preference.

Twenty three Principals and HODs identified training in leadership and decision making as their second preference. Moderate number of Principals and HODs in their second choice of training identified the areas like group behaviour (N = 15), motivation (N = 15), performance appraisal and development system (N = 14), State rules concerning staff and students (N = 14), conflict management (N = 13), Total quality management (N = 13), organisational change and development (N = 13), Values, attitudes and job satisfaction (N = 12), Stress management (N = 12), Project control (N = 11), Perspective and strategic planning (N = 10), and AICIE rules (N = 10). The least preferred areas of training in the second choice were career development (N = 8) and transactional analysis (N = 4).

Twenty Principals and HODs preferred training in motivation in their third choice. A sizeable number of principals and HODs in their third preference indicated the training areas like total quality management (N = 16), career development (N = 16), group behaviour (N = 14), values, attitudes and job satisfaction (N = 13), leadership (N = 12) and performance appraisal and development system (N = 10). Interestingly, 12 Principals and HODs in their preference of training indicated transactional analysis as their third preference.

TABLE 1

Priority of Training Needs as Identified by the Principals and HODs (N = 135) from all the Southern States.

AREAS	PREFERENCE		
	First	Second	Third
1. Leadership	40	23	12
2. Decision Making	37	23	15
3. Group Behaviour	6	15	14
4. Motivation	21	15	20
5. Conflict Management	10	13	6
6. Values, Attitudes and Job Satisfaction	10	12	13
7. Stress Management	7	12	9
8. Perspective and Strategic planning	9	10	7
9. Project Control	4	11	4
10. Total Quality Management	17	13	16
11. Organisational Change and Development	8	13	9
12. Career Development	21	8	16
13. Performance Appraisal and Development System	4	14	10
14. Transactional Analysis	1	4	12
15. State Rules Concerning Staff and Students	12	14	7
16. AICTE, Rules	14	10	5

17. Any other: Assertiveness (1), Industry Institute Interaction (1), Management Information system (1), Human relationships (2), Organisational Objectives (1), Communication Skills (2), Office Administration (1), Entrepreneur (2), Time Management (2), Accounts Management (2), Budget Planning (1).

Taking all the states together maximum number of Principals and HODs gave their first preference for training in leadership (Table 1). Forty Principals and HODs gave their first preference for training in leadership, 23 have given second preference and 12 have given third preference (Table 2). When equal preference hypothesis was applied the result came out to be significant.

TABLE 2

Frequency of Preference with Respect to Most Needed Training Area

	PREFERENCES		
	FIRST	SECOND	THIRD
fo	.40	23	12
fe	25	25	25

Chi square = 15.92 $df = 2$ $p < .01$

This further indicated that though principals and HODs had their order of preference for training with respect to a particular management area, their first preference may be considered as priority area while formulating and implementing any training programme. While taking into consideration the training areas of first preference (Table 3) considerably large number of Principals and HODs indicated training in leadership (N = 40), decision making (N = 37), motivation (N = 21). Even in their choice of first preference, the

difference is found to be significant. This further implied that it is better to organise training programmes in management according to the frequency of preferences.

TABLE 3

Major Areas of Training Needs Under First Preference

First Pre-ference	Leader-ship	Decision making	Motiva-tion	TQM	Career develop-ment
fo	40	37	21	17	21
fe	27.2	27.2	27.2	27.2	27.2

Chi square = 16.2   df = 4 $p < .01$

The need survey inventory covered sixteen areas. To get free responses one other column, namely "Any other" was put in the inventory. Some of the interesting areas which were otherwise not thought came out with varied frequencies. The compiled areas under "Any other" included training in Assertiveness, Industry Institute Interactions, Management Information System, Interpersonal relationship, communication skills, office administration, Entrepreneur Development, Time Management, Interpersonal relationship, Accounts Management and Budget planning. A few Principals have mentioned the areas like improving communication, organisational objectives and Human Relationships, under the column "Any other". These areas were already covered in the inventory.

TABLE 4

Priority Areas of Training Needs as identified by the Principals and NODs (N = 59) from the state of Karnataka.

AREAS	PREFERENCES		
	First	Second	Third
1. Leadership	24	15	6
2. Decision Making	24	9	6
3. Group Behaviour	4	8	6
4. Motivation	11	8	8
5. Conflict Management	4	10	4
6. Values, Attitudes and Job Satisfaction	5	6	10
7. Stress Management	3	7	5
8. Perspective and Strategic planning	8	6	2
9. Project Control	4	9	3
10. Total Quality Management	9	5	6
11. Organisational Change and Development	6	5	8
12. Career Development	13	4	8
13. Performance Appraisal and Development System	1	8	4
14. Transactional Analysis	1	4	7
15. State Rules Concerning Staff and Students	7	8	3
16. AICTE, Rules	11	4	4
17. Any other: Office Administration (1), Entrepreneur (2)			

The details of the preferences given by Principals and HODs for the state of Karnataka are presented in Table 4. So far as the maximum number of preferences are concerned, here the picture was slightly different from taking all the states together. The most preferred areas of training in management were two from karnataka state viz. leadership (N = 24) and decision making (N = 24). Thirteen principals and HODs preferred training in career development and 11 each in the areas of motivation and AICTE rules. All other areas of first preferences are below 10 in number. Thus the three major areas of training as emerged from the present survey from principals and HODs of Karnataka State were training in leadership, motivation and career development may be considered as priority areas of training.

Fifteen Principals and HODs preferred training in leadership as their second choice. Only 10 Principals and HODs in their second preference identified training in conflict management. Less than 10 principals and HODs in their second preference indicated other areas.

Ten Principals and HODs preferred training in values, attitudes and job satisfaction as their third choice of training. The number of principals and HODs were less than 10 with respect to other areas of training in their third preference.

Twenty four Principals and HODs gave their first preference for training in leadership and decision making areas but in case of second preference the frequency is higher in the area of leadership while compared with decision making (Table 4). Fifteen Principals and HODs gave their second preference in leadership areas compared to nine in the area of decision making. Six principals and HODs gave their preferences in both the areas.

TABLE 5
Frequency of Preferences with respect to Most Needed Training area in Karnataka State.

	FIRST	PREFERENCES SECOND	THIRD
fo	24	15	6
fe	15	15	15

Chi square = 10.8   df = 2   p < .01

When the equal preference hypothesis was applied to most needed training area i.e., leadership, the result came out to be significant (Table 5). This implied that though the principals and HODs had their order of preference for training with respect to a particular area of management, their first

preference may be considered as priority area while formulating and implementing any training programme. Only two areas were indicated under "Any other" from Karnataka state. These areas were training in office administration and entrepreneurship.

TABLE 6
Priority areas of Training Needs as Identified by the Principals and HODs (N = 47) from the state of Tamil Nadu.

	AREAS	PREFERENCE First	Second	Third
1.	Leadership	10	8	3
2.	Decision Making	9	10	8
3.	Group behaviour	2	3	5
4.	Motivation	5	4	10
5.	Conflict Management	4	3	1
6.	Values, Attitudes and Job Satisfaction	2	2	1
7.	Stress Management	4	5	2
8.	Perspective and Strategic planning	0	2	3
9.	Project Control	0	0	1
10.	Total Quality Management	8	6	5
11.	Organisational Change and Development	1	2	0
12.	Career Development	3	3	3
13.	Performance Appraisal and Development System	2	1	4
14.	Transactional Analysis	0	0	1
15.	State rules concerning staff and students	3	3	3
16.	AICTE, rules	2	5	0
17.	Any other: Office Accounts Management (2), Budget Planning (1)			

The details of the frequency of responses with respect to different training areas of management are presented in Table 6, for Tamil Nadu State.

Ten Principals and HODs in their first preference identified leadership as the most important area of training and then it was decision making where 9 Principals and HODs indicated it. Eight principals and HODs identified the area of total quality management whereas 5 Principals selected motivation. Frequency of responses in other areas were not very encouraging. While considering the training programme in educational management for the state of Tamil Nadu, the areas like leadership, decision making, total quality management and motivation may be considered on a priority basis.

In case of second preferences of response for Tamil Nadu state, the maximum number of Principals and HODs opted for the training in decision making (N = 10). In the order of frequency of responses, leadership (N = 8), total quality management (N = 6), AICTE rules (N = 5) and stress management (N = 5) were other areas.

Ten Principals and HODs in their third preference identified motivation as the priority area of training while 8 Principals and HODs identified the area of decision making. Five principals and HODs opted for group behaviour and total quality management.

The highest frequency of responses was in the area of leadership with respect to first preference. When equal preference hypothesis was applied to this area (Table 7), the result came out to be not significant. This implied

that preferences did not have much meaning with respect to priority of training. The training programme may be organised according to maximum number of frequency of responses.

TABLE 7
Frequency of Preferences with respect to Most Needed Training area in Tamil Nadu.

	PREFERENCES		
	FIRST	SECOND	THIRD
fo	10	8	3
fe	7	7	7

Chi square = 2.68   df = 2   p > .05

From the state of Tamil Nadu Principals and HODs indicated only two areas of management under "Any other" column. These areas were accounts management and budget planning.

The details of the frequency of responses along with preferences for Andhra Pradesh are presented in Table 8. A total of 26 Principals and HODs responded to the survey questionnaire.

Five Principals and HODs in their first preference identified motivation and career development as areas of training in educational management. Only 4 opted for training in leadership. Three principals and HODs wanted training in decision making and values, attitudes and job satisfaction. In comparison with other states, responses were comparatively less here. The responses in other areas of educational management were few only. Considering the small group of

subjects it may be suggested that training programme can be conducted in the areas of motivation, career development and leadership as relatively responses were higher here.

Six Principals and HODs in their second preference identified need for training in organisational change and development. Five Principals and HODs identified need for training in performance appraisal and development system while 4 in values, attitudes and job satisfaction.

TABLE 8
Priority Areas of Training Needs as Identified by Principals and HODs (N = 26) from the State of Andhra Pradesh.

	AREAS	PREFERENCE		
		First	Second	Third
1.	Leadership	4	0	3
2.	Decision Making	3	2	1
3.	Group Behaviour	0	3	3
4.	Motivation	5	3	2
5.	Conflict Management	2	0	1
6.	Values, Attitudes and Job Satisfaction	3	4	2
7.	Stress Management	0	0	2
8.	Perspective and Strategic planning	1	2	2
9.	Project Control	0	2	0
10.	Total Quality Management	0	2	4
11.	Organisational Change and Development	1	6	1
12.	Career Development	5	1	5
13.	Performance Appraisal and Development System	1	5	2
14.	Transactional Analysis	0	0	4
15.	State Rules Concerning Staff and Students	2	3	1
16.	AICTE, Rules	1	1	1
17.	Any other: Assertiveness (1), Industry Institute Interaction (1), Management Information System (1), Human relationships (1), Organisational Objectives (1), Communication skills (1).			

Five Principals and HODs in their third preference identified the need for training in career development. Four Principals and HODs indicated total quality management and transactional analysis as training areas.

When equal preference hypothesis was applied with respect to the area of motivation (Table 9) the result was not significant. It may be suggested that training programmes may be organised according to maximum number of frequency of responses.

TABLE 9

Frequency of Preferences with respect to Most Needed Training area in Andhra Pradesh.

	PREFERENCES		
	FIRST	SECOND	THIRD
fo	5	3	2
fe	3.33	3.33	3.33

Chi square = .626   df = 2   p > .05

Interestingly under the response of "Any other" certain important areas of management training were indicated by Principals and HODs of Andhra Pradesh. Those areas included training in assertiveness, industry institute interaction, management information system, human relationship and communication skills.

TABLE 10

AREAS	PREFERENCE		
	First	Second	Third
1. Leadership	2	0	0
2. Decision Making	1	2	0
3. Group Behaviour	0	1	0
4. Motivation	0	0	2
5. Total Quality Management	0	0	1
6. Any other: Time Management (2), Improving Communication (2), Interpersonal relationship (1).			

In the present survey the responses from Kerala were too small. Only three principals and HODs (Table 10) responded to the survey questionnaire. It is not feasible to suggest or infer anything on the basis of such poor responses. However, three areas, namely time management, communication and interpersonal relationship were suggested under "Any other" which appeared to be important.

IMPLICATIONS

Any training programme which is not need based is bound to have its own limitations and may not serve the clientele system. Training Principals and HODs who are otherwise busy with academic and administrative work, it is difficult to organise training programme on regular contact basis i.e., long term regular training programme which is also expensive and can reach a few within a short time frame. Therefore, training through an open learning system appears to be better and more effective. The present study lays the foundation of such open learning modular programme in which modules in the

educational management areas can be developed on the basis of the felt needs of Principals and HODs working in polytechnics and colleges.

The need assessment inventory developed in the present study was mainly based on the experiences of the authors. On the basis of the responses collected, it can be modified and developed further. The developed standardised version of the inventors can be used to appraise the management training needs of Principals and HODs.

The present study indicated the priority areas of training in Educational Management. The results of the present study may be useful for other organisations engaged in conducting management development programmes for Principals and HODs in identifying training courses.

REFERENCES

1. Burgoyne J.G, Stuart R (1976). The nature, use and acquisition of managerial skills and other attributes. Personnel Rev 5(4): 19-29.

2. Kaufman R.A (1972). Educational system planning, Prentice Hall, Englewood cliffs, New Jersey.

3. Humphreys, M and Oxtoby R (1995). Improving technical education in Egypt; Management development, international assistance and cultural values. Journal of vocational education and Training Vol 47, Num 3, 1995: 273-287.

4. Mukhopadhyay, B and Somasundaram, B (1993). A study of the need assessment of training for working technicians. Journal of technical and Vocational Education, Issue 10, 73-74.

5. Suarez T.M. (1981). Needs assessment. In:Lewy A, Devo.D (eds) 1981. Evaluation Roles in Education. Gordon and Breach, London.

6. Suarez T.M. (1985). Needs assessment. In: Torsten Husen and T. Neville Postlethwaite (eds). The International Encyclopedia of Education. Vol 6. Pergamon Press.

7. World Bank (1988), Education in Sub-Saharan Africa, Washington: World Bank.

ANALYSIS OF TECHNICAL VOCATIONAL EDUCATION FOR PROFESSIONAL DEVELOPMENT AND EMPLOYMENT

O.E. OCHUBA

ABSTRACT

The Federal Government of Nigeria introduced Vocational Technical Education as a basis for technological development. And then the set strategy to achieve the aim was the introduction of 6-3-3-4 system of education. Based on the research carried out. The Nigerian education system is yet to realise the aim as stated in the National Policy of Education. The only channel by which it can be achieved as pointed out in this paper is by employing the services of Vocational guidance counsellors.

Introduction:

The main aim of education is to apply the theoritical knowledge to practical use in order to solve the human environmental problems. To apply the solution successfully will lead to improved conditions of living, technological development and economic self reliance. The main field of education where the practical problems of man are addressed is the Vocational Technical Education.

Vocational Education is a generic concept which refers to all occupation related training. It encompasses the commercial, agricultural, and technical dimensions of education (Ehiametalor et al, 1989).

The Nigeria National Policy on Education stated the aims of Vocational Education as follows:-

1. to provide trained manpower in applied science, technology and commerce particularly at sub-professional grades;

2. to provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development;

3. to provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man;

4. to give an introduction to professional studies in engineering and other technologies;

5. to give training and impart the necessary skills leading to the production of craftmen, technicians and other skilled

personnel who will be enterprising and self-reliant; and

6. to enable our young men and women have an intelligent understanding of the increasing complexity of technology.

Based on the above stated aims, the Nigerian Government introduced the 6-3-3-4 system of education, the aim was to expose learners in the primary and junior secondary school levels to pre-vocational subjects so as to stimulate their interest in appreciation for manipulating skills, in addition to equipping them with rudimentary vocational knowledge.

The 6-3-3-4 system of education which means six (6) years in primary school, three years in junior secondary school, three years in senior secondary school and four years in the university cannot be said to be working because after ten years of its introduction, one still wonders if it is on the path to achieve the aims of vocational education as earlier stated.

From available literatures, there is evidence that the programme is not making the desired impact in schools. Uwadia (1992) said that there is a consistently low enrolment of students in the Technical Schools. This seems to show that students have little or no interest in vocational education. Eze (1992) in analysing the extent to which students would choose to study science and technology-related subjects, found out that introductory technology and science related subjects do not enjoy the acceptance of students. The observed increase in the rate of unemployment has also been attributed to the neglect of Vocational Technical Education.

Problems of Vocational Technical Education in Nigeria

The problems of technical education in Nigeria have been that of implementation and absence of strong evaluation strategy.

Another problem is inability to achieve appropriate status and prestige needed to perform proper and vital roles in a society which is increasingly becoming highly technical.

There is also the problem of merging general education with strategic occupational education to ensure maximum individual task competency.

Also, inability to accord Vocational Technical programmes suitable educational credits posses a problem.

Technical education is thought of as belonging to people who are not intelligent enough to do academic work.

Many Nigerians thought it is degrading to an intelligent man to work with his bare hands.

And also, people thought that the skills and habits which Vocational Education is meant to give could be acquired through mere apprenticeship.

The most important problem is how to ensure that Vocational Technical Education enables the learner to acquire the right competencies that are relevant and transferring to work in real life situations.

Career Services

There is need to expose the students to work experience and work study opportunities available. Professionals should be invited from different works of life to acquaint the students with required academic qualifications and job ethics in different fields.

The students should in addition be made to be aware of career opportunities available, subject combinations and courses that will help them to make choice. As listed by Devine and quoted by Ipaye (1983):

A - Technical/Practical Careers

    (i) Civil Engineering

    (ii) Electrical Engineering

    (iii) Telecommunications

    (iv) Mechanical Engineering

    (v) Motor Mechanic

    (vi) Mining

    (vii) Printing

    (viii) Railways

B - Career With People

    (i) Hotel and Catering

    (ii) Journalism

    (iii) Nursing

    (iv) Hair Dressing

C - Scientific Careers

    (i) Computers

    (ii) Dentistry

    (iii) Industrial Laboratory work

    (iv) Medical Laboratory work

D - Artistic Care

    (i) Art and Design

Problems of Unemployment

The high rate of unemployment among school leavers and university graduates has been attributed to lack of skills and competencies required in the field of work (Odo 1991). Ifedi (1982) in a reaction, agrees that one of the main causes of unemployment among schools leavers is lack of trained and employable skills. Many unemployed, according to Uzoagulu (1985), do not possess the necessary skills and competencies which the modern economy demands. This is why we are faced with the serious problem of shortage of competent · applicants and burdensome surpluses of unemployable manpower.

Uzoagulu further described unemployment as an economic menace and socially, a hydra-headed monster which casts ponderous responsibilities and implications upon government and the nation.

These show the need for manpower development in view to meeting the needs for employing skills among the masses of the Nigerian Citizens. Lack of employable skills is further worsened by the current trend in technology. Employable requirements according to Osuala (1985), are changing due to technological advancement.

However, proper Vocational Counsellors has been pointed out by this paper as a solution to this problem.

TABLE 1

Students' Enrolment in Junior Secondary School Vocational Education from 1988-93 in ten Secondary Schools. (A Survey Carried Out in Anambra State of Nigeria.)

Year	Schools									
	1	2	3	4	5	6	7	8	9	10
1988	147	284	152	200	176	230	320	315	190	178
1989	188	280	183	214	166	200	284	300	189	156
1990	199	232	170	184	167	205	310	320	191	180
1991	172	241	170	196	180	198	293	302	200	191
1992	170	252	150	200	183	186	300	281	184	176
1993	150	249	163	189	175	206	318	298	186	183

TABLE II

Students' Enrolment In Shorthand at the Senior Secondary Level From 1988-1993.

Year	Schools									
	1	2	3	4	5	6	7	8	9	10
1988	Zero	Zero	7	Zero	2	4	Zero	Zero	Zero	Zero
1989	Zero	Zero	9	Zero	1	Zero	Zero	3	Zero	Zero
1990	Zero	Zero	14	Zero	Zero	Zero	4	Zero	Zero	1
1991	Zero	Zero	Zero	Zero	Zero	Zero	Zero	1	Zero	Zero
1992	Zero	Zero	Zero	Zero	Zero	2	Zero	Zero	Zero	Zero
1993	Zero	Zero	Zero	Zero	Zero	Zero	Zero	Zero	Zero	Zero

TABLE III
Students' Enrolment In Typing at the Senior Secondary School Level from 1988-1993.

Year	Schools									
	1	2	3	4	5	6	7	8	9	10
1988	5	Zero	7	Zero	5	10	Zero	Zero	Zero	Zero
1989	5	Zero	9	Zero	3	Zero	Zero	12	Zero	Zero
1990	3	Zero	8	Zero	Zero	Zero	10	Zero	Zero	6
1991	5	Zero	Zero	Zero	Zero	Zero	Zero	10	Zero	Zero
1992	2	Zero	Zero	Zero	Zero	8	Zero	Zero	Zero	Zero
1993	Zero	15	Zero	Zero	Zero	Zero	Zero	Zero	Zero	Zero

Sources: (JSCE and SSCE Entry Schedule of the ten Post Primary Schools Used from 1988 to 1993.)

KEY

JSCE - Junior Secondary Certificate Examination
SSCE - Senior Secondary Certificate Examination
Years - 1988 to 1993 Academic School Years.

ROLE OF GUIDANCE COUNSELLORS

Vocational guidance and Counselling Services offer a package of services which could stimulate and direct student's interest in occupation related training with a view to achieving the aims of vocational education in Nigeria.

The counsellors analyses the individual and provide the useful occupational information.

Vocational guidance and counselling helps the individual to do a self-analysis to ascertain the type of person he is, how he differs from others, his needs, sources of satisfaction, his abilities and interests. Bojuwoye (1986) has specified the following type of information about the self need by the student making career choices:

1. the student's interest, the major types he has shown; the strength and stability of these interests;

2. the relationship of the individual's interests to his abilities and attitudes;

3. the extent to which the individual's interests are supported in the educational programme;

Issue '96

4. the student's aptitudes and abilities, his general ability to do the school work.

5. his special subject abilities, his reading abilities, and his working efficiency as related to his level of achievement;

6. the student's physical and emotional health level, and

7. his social and personal characteristics and background of family traditions, economic resources and personal contacts.

Vocational guidance counsellors agree that the knowledge of self will help the individual to identify his vocational interests and match them with his abilities. Knowledge of himself also enables the student to understand and appreciate individual differences observable in his environment. According to Bojuwoye (1986) he (the student) can see that people by nature are different and that these differences are to be respected and not condemned.

Therefore, self analysis would make an individual recognise that people can achieve heights not only by academic and high level of professional areas, but also in vocational or skill endeavours. The vocational guidance counsellor can apply its various self-assessment instruments to create self-awareness and help the students' interest in vocational courses and ultimately in skilled labour. Such occupational choice that is based on interest with abilities, would bring success, personal satisfaction and an effective and useful citizenship.

Vocational guidance and counselling also runs the service of providing occupational information for students. This involves the collection and dissemination of materials on occupation.

In other words, the school guidance counsellor is expected to explore the job market, locate, interprete, explain and store a wide range of occupational information with respect to job requirements, conditions of service, advancement pattern, existing and predicted supply and demand for workers and sources for further information. (Shertzer and Stone 1976).

With this type of guidance, the students will be exposed to the realities of the Nigerian labour market. The parents should also be acquainted with a clear picture of the vocational needs of the nation by means of an outreach guidance programme. The recommendations are based on the conviction that without an adequate information on the manpower needs of the country, students may succeed in qualifying for one kind of job in a nation with other sectors without adequate personnel. This is a situation of mass unemployment in a country.

Recommendations/Conclusion

Effective Vocational Technical Education cannot be achieved if the Government ignores the services of Vocational guidance counsellors. The post primary level is the preparatory level before students can proceed to higher levels of education. Okonkwo (1994). So, the services of Vocational guidance counsellors at this level cannot be overemphasizesd. There is need for students at this level to be exposed to the services of Vocational guidance counsellors. It is only when this is done that our youths who are technically inclined, will be pulled together

for an effective professional education for gainful employment after their educational careers.

REFERENCES

1. Adedibu, A.A. (1986). Unemployment: Issues, trends and implications for vocational guidance. In Ipaye, T. (Ed.), Educational and Vocational Guidance Ife, University of Ife Press.

2. Anameze, L.N. (1994). Achieving the aims of vocational technical education in nigeria: the role of guidance and counselling, Conference Paper.

3. Ehiametalor, E. (1989), Vocational education at the secondary school level. In Ehiametalor, E. Izuagie, M.A. and Olaitan, S.O. (Ed.), Implementation of National Policy on Education Theoretical and Empirical Analysis. Benin City, NERA Publications.

4. Eze, T.I. (1992). Introductory technology: An integrated area of study in Nigeria Education. Nigeria Vocational Journal.

5. Federal Ministry of Education (1989). National Policy on Education, Lagos. National Education Research and Development Council Press.

6. Ifedi, C. (1982). Manpower development, job opportunities. Business Times, May 24, P. 22.

7. Odor, C. (1991): The role of business education in the teaching of employability Skills in Nigeria In Mkpa. Ed. (1991). Contemporary Issues in Nigerian Education.

8. Okonkwo, W.N. (1994). An assessment of the junior secondary school business education curriculum and developing school, A Conference Paper.

9. Osuala, E.C. (1985). The development of business education with implication for meeting intermediate manpower needs of Nigeria. Vocational Educator, 5th Ed. UNN.

10. Uzoagulu, A. (1985). Vocational education: A means of mass employment in Vocational Educator, Nsukka.

11. Uwadiae, S.A. (1992). A survey of the expansion of vocational - technical education in Nigeria between 1978 and 1989. Nigerian Vocational Journal Vol.IV.

12. Uyanga, R.E. (1990). Career counselling and need disposition. Nigerian Journal of Technical Education.

STUDENT EVALUATION IN POLYTECHNICS IN INDIA

S.P. BEDI

ABSTRACT

Polytechnics in India offer diploma level programmes and produce technicians who occupy middle level positions in the industry. The objectives of the present study were to describe the existing system of student evaluation in the states of Haryana, Punjab, Chandigarh and Delhi, identify drawbacks in the system of student evaluation and to propose interventions for improving the system of evaluation.

Polytechnics in India offer diploma level programmes and produce technicians who occupy middle level positions in the industry. About twenty percent of these institutions also offer post diploma/advanced diploma programmes. The planning, promotion and control of technician education rests with the All India Council for Technical Education (AICTE) and the Bureau of Technical Education in the Ministry of Human Resource Development, Government of India. Each state has a Directorate of Technical Education which is responsible for planning, management and administration and funding of these institutions. The activities like curriculum development, testing and evaluation of students' competence, award of diploma etc. are looked after by respective State Boards of Technical Education.

The minimum qualifications for admission to polytechnics is 10 + as prescribed by AICTE. Most of these institutions offer generalized diploma courses in Civil, Mechanical, Electrical and Electronics engineering. The duration of these courses is three years. However, in polytechnics which offer sandwich programmes, the duration ranges from three and half years to four years. Semester pattern is being followed in most of engineering disciplines.

The quality of output from these institutions much depends upon the quality of teaching learning processes used and the ways students are evaluated. Any system of student evaluation should meet following purposes (Malhotra, 1986)

• monitor student progress

• provide feedback to students regarding their strengths and weaknesses and their comparative achievement

• provide feedback to teachers regarding effectiveness of their teaching methodology

- provide feedback to curriculum analysts for reviewing curricula

- provide feedback to administrators about implementation of curricula

- grade and certify students.

A few studeies conducted in this area by Study Group on Examination Reforms (1978), Malhotra et al 1989, 1990, and Harper and Harper (1990) revealed following drawbacks in the system of Education - Poor quality of question papers, more emphasis on memorization, lack of specific guidelines for carrying out internal assessment, variations in the components and weightages assigned to them in theory, theory-cum-practical and practical subjects. However, no intensive study has been undertaken in the northern region for analyzing the system of student evaluation both internal and external. Therefore need was felt to undertake study on determining the existing status of student evaluation in the region.

Objectives of the Study

The objectives of the present study are to:

- describe the existing system of student evaluation in the states of Haryana, Punjab, Chandigarh and Delhi

- identify drawbacks in the system of student evaluation and

- propose interventions for improving the system of evaluation.

Methodology

Survey design was used to collect information.

Sample:

The sample of the study consisted of a total of 112 teachers and 353 students from seven polytechnics from the said states. The number of polytechnics selected from the states alongwith the number of teachers and students from these polytechnics that constituted the sample of the study are given in Table I.

TABLE I
Statewise Number of Polytechnics, Teachers and Students.

Name of the State	Number of Polytechnics selected	Number of	
		Teachers	Students
Delhi	2	33	100
Punjab and Chandigarh	3	50	180
Haryana	2	29	73
Total	7	112	353

Tools:

Two questionnaires were developed for collecting information regarding different aspects of student evaluation. Items included in the questionnaires relate to internal assessment, end of term examinations, rules for promotion and certification. In addition an attitude scale was used to know the reactions of teachers and students about the different aspects and activities of students evaluation.

Collection of Data:

Questionnaires and an attitude scale were administered on teachers and students personally by the investigator.

Findings:

The data thus collected was summarized and analyzed. Board of Technical Education and Industrial Training, Punjab also conducted examinations of polytechnics in Chandigarh. Information pertaining to polytechnics in Chandigarh is discussed alongwith Punjab State.

System of Evaluation:

In the states included in the sample, the major components of system of student evaluation in vogue are continuous evaluation (internal assessment) and end term examinations. Written tests are conducted for theory subjects and theory portion of theory-cum-practical subjects and practical tests are conducted for evaluating student's performance in practical subjects and practical area in theory-cum-practical subjects.

Features of internal assessment and end term examinations as revealed through the information collected from the different states is discussed below:

Features of Internal Assessment:

- The major elements for awarding marks in internal assessment to students in theory subjects or theory portion of theory-cum-practical subjects are class tests, home assignments and class work.

- The weightages assigned to these elements varies from state to state. In the State of Delhi, a high percentage of teachers (90%) assign 80% weightage to class tests and 20% weightage to home assignments and class work. Rest of the teachers reported that they assign 100% weightage to class tests.

Eighty percent of the teachers in the sate of Haryana assign 40% weightage to class tests and 30% each to class work and home assignments. The Board of Technical Education officials agreed to the above information. However, rest of the teachers differed among themselves on the percentage of weightage assigned for these elements.

Forty two percent teachers in the state of Punjab and Chandigarh assign 70% weightage to class tests and 15% each to class work and home assignments. 28% of the teachers differed among themselves on the percentage of weightages assigned to these elements. Rest of the teachers differed even on the elements included for assigning internal assessment.

- The major elements included by teachers in the assessment of practicals are - laboratory note book, performance in laboratory, performance test and viva-voce. There are large variations with respect to the weightages assigned to these elements.

- For assessment of project work the elements of performance, drawing, model, viva-voce, project report, sincerity, attitude, initiative etc. are included in various combinations by the teachers in the states included in the sample.

- When the students of the three states/U.T. were asked about the elements of internal assessment and the weightages assigned to them, they differed considerably and had a great variation.

- Three class tests are conducted in each semester/year. Teachers generally announce class tests 7 to 10 days in advance.

  Essay type, short answer, sketch work and numerical problems are used for construction of class tests. Teachers use them in various combinations.

- There are variations as to the number of home assignments given by teachers in a semester/year in the three states.

  The modal value is one per month for the states of Punjab and Haryana as reported by teachers. Students of Punjab also gave the same information. On the contrary, students of Haryana stated that they were assigned three assignments per month.

  In the state of Delhi there are variations among teachers as regard to number of assignments given by them in both the systems - semester and annual. Similar variations are there in the responses from students.

- No inference can be drawn regarding feedback given to students except for the marks obtained, as the information received from teachers and students is not in agreement.

- There are wide variations in the perception of teachers and students regarding fairness/biasing in awarding

internal assessment, objectivity in assessing class work and objectivity of methods employed for assigning internal assessment.

- There exists a system of rationalization of internal assessment marks in the states of Punjab and Haryana. Teachers and students feel that rationalization procedure helps in reducing disparity in scores attained in different subjects while they differed on appropriateness of procedures followed for rationalization.

Features of End-Term Examinations:

- End term examinations are conducted for both theory and practical work.

- Polytechnic teachers, experts from higher institutions and from industry are involved by Boards of Technical Education in setting examination papers and for conducting practical examinations. However, the degree of involvement of above categories of persons differ from state to state.

- The components of evaluation of practical examination as reported by teachers and students are - laboratory notebook, performance test and viva-voce.

- Item bank facility for setting examination papers does not exist with Boards of Technical Education of these states.

- There is provision of re-evaluation of answer scripts in the state of Punjab. While in Haryana and Delhi only rechecking of answer scripts is allowed.

- There does not exist any system with Boards of Technical Education for providing feedback to teachers on analysis of results.

- For arriving at final marks, different weightages are given to marks obtained in different semesters in Punjab. While in the state of Haryana only final year marks (5th and 6th semester marks) are counted for awarding diploma.

Drawbacks in the Present System of Evaluation:

The present system of course work evaluation as well as end term examinations has failed to fulfill many of its essential purposes outlined above. The major weaknesses in the system are discussed below:

Drawbacks in Internal Assessment:

The information collected from teachers and students from the states of Punjab, Haryana and Delhi revealed following drawbacks in the internal assessment in vogue:

- Lack of specific guidelines for carrying out internal assessment.

- Variations among teachers in the components used and weightages assigned to them for evaluation of students performance in theory and practical work.

- Absence of component of personal capabilities like originality, initiative, team work etc. in the evaluation of students' performance in practical work.

- Use of limited number of techniques of assessment.

- Inadequate reporting about students performance in class tests which is restricted to announcement of marks.

- Subjectivity in assessment especially in assessing practical work.

- Copying in home assignments by students.

- Lack of content validity of test papers used for evaluating students in theory.

- Lack of information about assessment procedures to students.

- Lack of provisions for remedial instruction to students.

Above findings were also revealed in the status study of internal assessment conducted by Malhotra et al (1989).

In addition teachers tend to award minimum prescribed percentage of internal assessment to almost all students (because of threats, subjectivity). Teachers and students in general, are not satisfied with the present system of internal assessment.

Drawbacks in End Term Examinations:

The important testing tools in the end term examinations are the question papers in theory and practical. If these are properly designed they can bring out in the best manner the quantum of knowledge and skills acquired by the student in the subject and to apply the acquired skills in problem solving. The information gathered from the afore mentioned states reveal following weaknesses prevalent in paper setting and other aspects of end term examinations.

- Poor quality of question papers used for evaluating students performance in theory subjects.

These papers lay more emphasis on memorization at the expense of other more important abilities, cover the curriculum partially and encourage selective study by students (Malhotra et.al., 1990).

External choice, lack of balance in question papers and low percentage (40%) of marks required for passing end term examinations encourage students to skip portions of curriculum area.

- Inadequate guidelines to paper-setters.

- Lack of item bank facility at the State Boards of Technical Education.

- Subjectivity in marking answer sheets.

- Absence of report back mechanism for providing information about evaluation results to stake holders.

- Unequal weightages given to different semesters.

In Haryana final award in diploma is based only on performance in 5th and 6th semester examinations, where as in Punjab 25% marks of I and II semester examinations, 50% of each of III and IV semester examinations and 100% in each of the V and VI semester examination are added to arrive at the final marks in diploma. This effects seriousness of students towards studying rest of the subjects.

Interventions for Making System of Student Evaluation Objective:

Interventions for making system of student evaluation, continuous evaluation (internal assessment) and end term examinations more objective, are discussed below:

Interventions for Internal Assessment

The system of continuous evaluation should serve functions of formative evaluation. i.e. providing feed back to students to facilitate learning. In addition, it can be used for grading the students. Malhotra and Tulsi (1991) in the paper on Design of Internal Assessment have suggested a detailed scheme of carrying internal assessment by identifying components of assessment for theory and practical subjects, designing valid and reliable techniques and tools of evaluation and building up a report back mechanism that would provide information to all stake holders especially students for undertaking correcting measures to enhance their learning.

Interventions for End-term Examinations

The quality of end-term examinations used for summative evaluation can be improved upon by bringing changes in the various aspects of end term examinations namely - papers setting, techniques of assessment, marking and certification. The following suggested measures take into account the recommendations of the earlier studies by Malhotra et al (1990) and Bedi (1990).

Improving Quality of Question Papers

More valid question papers can be set by reframing guidelines for paper-setters. The following should form part of instructions to papers setters.

- Table of specifications indicating weightages for different ability levels and topics should be provided in the guidelines.

- The questions should cover the different ability levels depending upon the nature of the subject.

- External choice should not be given in the questions papers.

If at all it is to be given, frame questions in such a way that topics with higher weightage form a part in number of different questions from the different topics. But at the same time it should not violate the premise on sequencing questions from easy to difficult.

Using Openbook Examinations

Open book examinations should also be employed for subjects which are of applied nature. Questions set in these examinations should require application of concepts, principles, theories etc. for analyzing, synthesizing or evaluating information.

Establishing Item Banks

Establish item banks at the State Boards of Technical Education for constructing valid and reliable question papers.

Improving Scoring of Answersheets

For making scoring of answersheets more objective following measures are required:

- Provide examiners with detailed marking scheme to ensure inter-rater reliability.

- Scoring of answer sheets should be done at some central place and evaluate all answers to one question before going on to the next question.

Building Report Back Mechanism

Reporting of evaluation results to stake holders is essential to improve teaching learning processes, promote student learning, improve curriculum and promote research in the area of student evaluation. While designing the report back mechanism the issues - what feedback to be provided, how and when it is to be provided and what follow up action is to be desired, need consideration.

Assigning Equal Weightages to Different Semesters

All semesters should carry equal weightage towards grading and certification. Because all subjects included in the curriculum are equally important and contribute towards the development of requisite capabilities amongst the diploma holders.

The realization of said interventions for improving system of student evaluation would help in enhancing the quality and standards of technician education. This can be achieved only if the personnel (teachers, curriculum experts, researchers etc.) involved in implementing at various levels are trained.

REFERENCES

1. Bedi, S.P. (1991) Propositions for improved methods of students evaluation. Published in the Proceedings of the National Conference held at MACT, Bhopal (1990).

2. Harper, A.E., and Harper, E.S. (1990). Preparing objective examinations, New Delhi, Prentice Hall of India Pvt. Ltd.

3. Malhotra, M.M., Menon, P.N., Bedi, S.P. and Tulsi, P.K. (1989) Status of Internal Assessment of Students in the Polytechnics of Haryana, Chandigarh, TTTI.

4. Malhotra, M.M., Bedi, S.P., Tulsi, P.K. (1990). Content analysis of question papers set in the board examination of haryana polytechnics," Chandigarh, TTTI, (1991).

5. Malhotra, M.M.; and Tulsi, P.K. (1991) Design of internal assessment, Published in Proceedings of the National Conference held at MACT, Bhopal.

6. Recommendations based on Workshop on Examination Reforms for Delhi, TTTI, Chandigarh, 1992.

7. Study Group Meeting on Examination Reforms, 6-13 June, 1977 APEID, UNESCO, Regional Office for Education in India and Oceania, Bangkok.

FUNDING TECHNICAL EDUCATION IN A DEPRESSED ECONOMY: EFFECTS ON TECHNOLOGICAL DEVELOPMENT OF NIGERIA

G.E. ODUNUKWE

ABSTRACT

Nigeria, a third world country, is currently experiencing economic depression. This depression, no doubt, has adversely affected the funding of technical education. Technical education itself is the basis for technological development of any country. On this basis, this paper examined the economic factors that tend to militate adequate funding of technical education vis-a-vis their effects on technological development. Adequate and alternative sources of funding of technical education in Nigeria are recommended.

Introduction

The National Policy on Education (1981) approved the introduction of technical education into the educational curriculum in Nigeria. Recognising that technical education forms the basis of our technological development, the Federal Government of Nigeria substantially increased its expenditure in this area in the Third Development Plan period. For purposes of imparting the much desired technical education, different institutions offering technical education were established at both Federal and State levels. Such institutions include Technical colleges, Federal Colleges of Education (Technical), Polytechnics and Universities of Technology. In 1987 the Federal Government introduced the 6-3-3-4 system of education and included vocational subjects in the core curriculum of Junior Secondary Schools. The major objective of this is to acquaint the recipients with the basic practical and applied skills as well as enabling them become self-reliant and independent of white collar jobs that are not readily available.

The National Policy on Education (1981) has the following as the aims of technical education in Nigeria:

a. to provide trained manpower in applied sciences, technology and commerce particularly at sub-professional grades;

b. to provide the technical knowledge and vocational skills necessary for agricultural, industrial, commercial and economic development;

c. to provide people who can apply scientific knowledge to the improvement and solution of environmental problems for the use and convenience of man;

d. to give an introduction to professional students in engineering and other technologies;

e. to give training and impart necessary skills leading to the production of craftsman, technicians and other skilled personnel who will be enterprising and self-reliant, and

f. to enable our young men and women to have an intelligent understanding of the increasing complexity of technology.

This programme has a lot of prospects for both the individual and the nation as a production of appropriate workforce is to be assessed and accelerated development of the nation guaranteed. The zeal with which Nigeria wants to develop technologically made the Federal Government to establish many universities of technology, Federal Polytechnics, and Federal Colleges of Education (Technical). State Governments are not left out. Each State of the Federation has its own State Polytechnic and/or a university of technology, all stressing technical and technological education. Each of these institutions requires adequate equipment and workshops, skilled and qualified technical manpower who are knowledgeable, as well as adequate funding. This is capital intensive more especially for a third world country like Nigeria faced with a terrible economic recession. Nigeria's economic problem stems from planlessness. With the discovery of crude oil in the 60's, she abandoned agriculture and depended wholly on crude oil production as the only major source of revenue.

Today, many countries have become oil producers, thus leading to oil glut. This has led to fluctuations in the crude oil prices each year. Such fluctuations make the implementation of the national budget each year very difficult if not impossible, since the budget is based principally on current crude oil prices which are subject to fluctuation. For this reason, revenue allocations made each year to the education sector in general, and to technical education in particular is never realistic. Adequate funding of the numerous existing technical institutions is now a mirage. The net result is that most of these institutions now lack befitting workshops and necessary equipment as well as skilled manpower basically essential for technological takeoff.

In most Polytechnics and Universities of technology, faculties or schools of engineering are non-functional because they did not meet up accreditation standards specified by the National Board for Technical Education (NBTE), National Universities Commission (NUC), and National Commission for Colleges of Education (NCCE) as the case may be. This, definitely, is a major set back on our anxious march towards technological emancipation. However, Nigeria is not alone in this economic mess. Only countries, through foresight, that have diversified their economies are surviving, hence the great need for alternative sources of funding technical education in Nigeria.

History of Funding Technical Education in Nigeria

In 1945 The Commission for Higher Education made the first major attempt towards institutionalizing technical education in Nigeria by recommending the conversion of the premises of former Yaba Higher College into a technical institution (Fafunwa, 1974). In recognition of the role of technical education in technological development of the country, successive governments set up other machineries aimed at encouraging the move.

Notable among these steps was the setting up of a secondary and tertiary technical institutions. By 1992, about 5 Federal Universities of Technology, 50 Polytechnics and 150 Technical Colleges has been established in Nigeria (Olaitan, 1992).

The Nigerian government, within the limits of its lean resources, has made some revenue allocation to these institutions since the mid forties. In 1946, for instance, the Federal Government made available a grant of four hundred pounds for the establishment of handcraft centres, trade centres and technical institutions, (Fafunwa, 1974). In the second development plan (1970 - 1974). The Federal and State Governments had a total annual allocation of 12.3 million pounds for technical education projects, Iloh in Okolo (1994). In the fourth National Development Plan (1981-85). The Federal and State governments allocated 400.2 million Naira and 736.649 million Naira respectively for the provision of quality technical education (Biose, 1973). In the 1970's the Federal government entered into technical agreement with some foreign countries like France, Italy, Bulgaria, and Rumania for the short-term training of Nigerians to meet our middle-level manpower needs, Ministry of Education, (1978). Also in 1980's the Federal Government entered into another agreement with United States of America for the training of technical teachers under the Technical Teachers Training Programme (TTTP), Biose (1993).

Over the years, the Federal Government has made several budgetary allocations and also launched several schemes for the improvement of funding of the existing numerous technical institutions. In 1987, through the Ministry of Science and Technology, the Federal Government launched a 400 million Naira National Science and Technology Fund to which it donated 10 million Naira, (Kubeyinje, 1987, Okolo, 1994). The essence of this was to have an endowment fund to ensure regular and sustained funding of technological development. Between 1985 and 1991, under the Bureau for External Aids, the Federal Government of Nigeria trained 366 technical teachers in introductory technology in Britain, France, and Canada and provided 120 million US dollars World Bank credit facility for the Federal Universities as special grants for purchasing library books, journals, laboratory and workshop equipment, localized T.T.T.P. and established eight new technical colleges and more Federal Colleges of Education (Technical), Federal Ministry of Education, 1991).

From the discourse, the Government of Nigeria, within the constraints of the present harsh economic depression has made some contribution towards the funding of technical education. However, more is expected and government alone can no longer afford it. Other sources of funding to augment Federal Government effort has therefore become inevitable, hence the clarion call for alternative or supplementary sources of funding.

Factors Militating Against Effective Funding of Technical Education in Nigeria

These factors are numerous but there are some that easily come to mind. Economic depression which is global however, poses a great threat to this funding, and this has in turn given rise to inflation. The effective management of any organisation is accomplished through making realistic and balanced budget each fiscal year. Unfortunately, in the face of the current global inflationary trends, national financial budget

are usually rendered unrealistic, thus making the implementation of the already made monetary allocations to various sectors difficult. This is partly why allocations do not receive a boost.

The fluctuating value of the national currency (the Naira) is another factor dependent on the nation's economic depression. Most equipment for technical education are imported and the training of most technical teachers takes place overseas. Between the time the budgetary allocations are made and the actual time the allocated fund is released for buying of the equipment and training of technical teachers, the value of the Naira must have definitely fallen drastically. The net effect is that the allocation which may have been relatively manageable for the purposes will definitely no longer go a long way because the worth of the Naira in the world market will then be too low. The result then is that enough equipment will no longer be bought and overseas training of technical staff will also be negatively affected.

The economic crunch has also affected individual businessmen who would have been in a better position to make donations towards the upkeep of technical education. Some businesses and industries have closed down and their net income limited, thus preventing them from thinking in that direction.

Over-valuing of contracts for the construction and equipment of technical workshops is yet another major factor. Funds which would have been used for constructing and equipping many more such workshops are diverted to few individual pockets. The little that is left is then used for the project. This affects both the quantity and quality of the work executed.

Obvious Effects on Technological Development

Technology per se can be seen as the study, mastery and utilization of manufacturing methods and industrial arts, as well as systematic application of knowledge to critical tasks in industries. In this context, development can be seen as efficient supply of electricity, tele-communication, good water supply, health facilities, good transportation network and services necessary to improve the socio-economic life of the society (Okolo, 1994). Technical education can therefore be seen as sina qua non for technological development. It orientates the totality of man towards improved productivity. This, it does through arousing man's inquisitive tendency and induces in him more receptive attitude towards the problems in his immediate environment. The success of technical education to a large extent determines the level of technologies advancement of any nation. This implies that anything that adversely affects technical education definitely negates and slows down technological development.

Since economic depression affects adequate funding of technical education, it therefore negatively affects Nigeria's technological development. This is evidenced in inadequate construction and equipment of laboratories and workshops, inadequate manpower development, and non-availability of the required relevant textbooks. Lack of adequately equipped workshops implies lack of adequate practical training and preponderance of theoritical teaching and learning of technology. Lack of skilled and qualified teachers amounts to imparting poor quality of technological know-how. Finally, lack of relevant texts implies low content of

the knowledge imparted. This is a chain reaction.

If inadequate funding continues and technical teachers cannot be trained properly, the half-baked product will then turn out to be the next generation of technical teachers, and the vicious cycle will continue.

Possible Supplementary Sources of Funding

Despite the present economic recession, that appears global, industrial and commercial firms are still better-off since all their ventures are wholly profit-oriented. Such firms can aid technical institutions within their locality. This contribution would be done by way of annual subvention to Industrial Training Fund (ITF) to enable the body mount in-service training for unskilled employees in industrial and commercial firms, as well as sponsoring attachment programmes · for prospective employees. The already existing facilities of such firms could be used by technical schools in their locality for field trips and practical lessons.

2. Technical schools can generate funds internally in several ways. They can generate funds from their carpentry, electrical and mechanical departments by engaging in house building, electrical installations, furniture construction and automobile repairs during their practical lessons and contract jobs. Such practical lessons can also be used for repairs and maintenance for the school, thereby saving cost.

3. Technical schools should be encouraged to establish effective alumni associations. If well organised, members could sponsor the construction of classroom blocks, workshops, hostel

complexes and equipment of libraries (Bray, 1986).

4. Instead of proliferating technical institutions, wealthy churches can make subventions to already existing technical schools of their interest or those in their localities.

Recommendations

From the above discourse, it is a self-evident truth that the Federal Government has made some inroute in funding technical education in Nigeria within the limits of her lean resources. This should not have been otherwise as it is crystal clear that technical education is the bedrock for technological emancipation of any country. Nothing else can make this a reality than adequate and prudential funding of technical institutions. In the light of the above, the paper makes the following recommendations for improved funding of technical education in Nigeria.

1. The Federal and State Governments should stop proliferation of universities of technology, Polytechnics, and Colleges of Education (Technical). The existing ones are most inadequately funded, ill-equipped and ill-staffed, thereby producing half-baked technicians and technologists. This does not augur well for the technological advancement of a third world country currently tormented by economic recession. Attention should be paid to refurnishing the existing ones.

2. Commercial and industrial firms should increase their financial involvement in technical education. They can give grants or loans spaced over a long period and with marginal interest to

enable such institutions invest in technical education and pay back with ease.

3. Training of technical education staff, whether locally or overseas, should be made a long-term programme to be meaningful. Training such teachers just for about two to four years will not enable the trainees acquire the much needed technology for effective transfer to others.

4. Since no country is very willing to market its own technology, greater emphasis should not be on overseas training. It is capital intensive and does not achieve the desired purpose. Nigeria should continue to look inwards for the development of its own technology.

5. Technical institutions should commercialize their services and products to supplement external funding. Furniture, blocks, metal products produced by students can be sold to prospective buyers.

6. The Federal Government budget, upon which allocations to educational institutions revolve should be made to be realistic and not political each fiscal year, so that whatever allocation is made is real money and not a shadow of it.

Conclusion

It can be seen that the Federal Government of Nigeria has made some financial input in the funding of technical education, notably because the programme has a lot of prospects for both the individual and the nation. The best option for the country is to acquire the right type of technology best suited for the inhabitants. To achieve this the government should avoid proliferation of technological institutions especially at the tertiary level. Funding technical education is capital intensive. Since revenue allocations to education sector are based on national budgets which in turn depends directly on crude oil revenue, the Federal Government should diversify its economic base in the face of the present persistent oil glut. This definitely will widen the country's revenue base. Other supplementary sources of revenue are strongly recommended to augment the already stretched Government's lean resources.

REFERENCE

1. Biose, C.A. (1993). Financing vocational education: Alternative sources. A paper presented at the 8th Conference of the National Vocational Association at University of Uyo.

2. Bray, M. (1986). New resources for education: Community management and financing of schools in less developed countries. Pergamon Press, London.

3. Fafunwa, A.B. (1974). History of education in Nigeria. George Allen and Unwin; London.

4. Federal Ministry of Education, (1978). Overseas Training Cost Analysis. News Bulletin, Lagos.

5. Federal Ministry of Education, (1981). National Policy on Education(Revised), NERC Press, Yaba, Lagos.

6. Federal Ministry of Education (1981). Achievements Under Babangida's Administration (1985-1991), University of Lagos Press, Lagos.

7. Okolo, J.C. (1994). Financing technical education. A paper presented to 8th TSWAN Conference at Federal College of Education (Technical) Umunze, 23rd-26th May, 1994.

8. Olaitain, S.O. (1992). Domestication of the technical teachers training programme and its implications for sustainable economic development. University of Nigeria Press, Nsukka.

RURAL DEVELOPMENT THROUGH COMMUNITY POLYTECHNIC SCHEME

SRINIVASAN. R.

ABSTRACT

The role of polytechnics under Community Polytechnic Scheme (CPS) to raise the standard of living of ruralites together with other rural development programmes is stressed. Suggestions to make their functioning more effective have been offered.

In order to involve the technical education institutions too in its efforts at accelerating the pace of development of rural areas the Government of India had launched the Community Polytechnic Scheme (CPS). Under the direct central assistance this scheme was instituted in 1978-79. Identified polytechnics which have the potential to serve as change agents of rural society are permitted to implement the CPS. They get grants from the Ministry of Human Resource Development and undertake activities for the promotion of standards of living of ruralites in their neighbourhood.

These technical institutions besides producing technicians for middle level positions in industries act as nodal centers taking up a variety of activities utilising their expertise for community development. It is laudable that by their activities they have established a close link with community and other agencies involved in similar efforts.

THE GENESIS

The real concern of the Government to implement various schemes for the economic betterment of rural areas of the country needs no emphasis. The CPS is also a milestone in paving the way for a better future for the ruralites. Every one is aware of the Integrated Rural Development Programme (IRDP) also launched on 2 Oct. 1980 simultaneously throughout India and being adopted by the Government machinery itself through District Rural Development Agencies (DRDA). Besides IRDP and other rural development schemes the CPS is also meant for rural prosperity via technical education subsystem.

In order to see the benefits reach the rural segments of our population the Government has initially identified some selected polytechnics in rural and semi rural areas so that rural people will have the feel of identifying themselves with the polytechnics in their vicinity supporting them in their advancement. The success of the CPS is evident from the fact that along with other rural development programmes the activities under this scheme have brought a decline in rural poverty and the man power training schemes have led to increased employment prospects for ruralites in general. The CPS has

the twin goals of poverty alleviation and employment generation like any other programme.

The polytechnics on their part have necessary infrastructure in terms of men and machinery which has been extended for the benefit of the ruralites. The staff who are drafted for this work have developed nice working relations with the Non-Governmental Organisations (NGOS, banks, District Industries Centers (DIC) in helping rural youth to improve their prospects.

The immense potentiality of the CPS is that it has proved that training in skill development which has enabled rural youth develop their human resources has contributed to personal and national economic growth. Those who have got wage employment after undergoing manpower training in CPS is the clear indication of the direct effect. Hence the CPS has contributed to increased work participation rate among the ruralites for the national prosperity.

IMPACT OF CPS

An analysis of the following statistics reveal the impact of CPS in promoting the economic well being of rural masses along with other similar efforts.

The Percentage of Population living below the poverty line in India in 1977-78 at the beginning of CPS and in 1990-91 on the completion of VII plan highlight the success in this direction.

Table 1
Indian People Below Poverty Line
(1977-78-1990-91)

Year	Population			Percentage		
	Rural	Urban	Total	Rural	Urban	Total
	(in millions)					
1977–78	264.3	67.7	322	53.1	47.4	51.8
1979–80	260	57	317	50.7	40.0	48.4
1987–88	229.4	83.3	312.7	39.1	40.1	39.3
1990–91	218.4	79.5	297.9	35.0	37.0	35.5

It is thus evident that during the 1980s when the Sixth and Seventh five year plans were implemented with a high push on poverty eradication through various schemes rural poverty was reduced by 15.7% whereas the corresponding decline was only 3% in urban areas.

If we look at the work participation rate in India the census estimate are:

Table 2
Work Participation Rate in India
(1971–91)

	Rural	Urban	Total
1971	35.3	29.6	34.2
1981	38.8	30.0	36.7
1991	40.2	30.4	37.7

Though the work participation rate of population showed an increase since 1971 the trend of encouragement is more pronounced in rural areas than in urban centers. Throughout the two decades of 1971-91 urban areas accounted only for a marginal rise of 0.4%

per decade. The rural areas resigered more increase than the urban and national figures. The rural development schemes implemented in 1980s have made possible such a transformation. Work participation rate has to be stepped by training youth in productive enterprises. We must try to achieve atleast 50% work participation base in the country by 2000 AD. For that only argumenting human capital by training is the mechanism. Our goal should be to train atleast one in each poor family in the country through CPS and other IRD programmes.

IMPACT OF CPS IN SOUTHERN REGION

No doubt the CPS along with the other similar schemes have brought in substantial improvement in the living conditions of ruralites in the Southern Region too which is evident from the data furnished below.

Table 3
People below Poverty Line in Southern Region (in %)

State	1977-78	1987-88	Decline in 10 years
Andrapradesh	42.2	27.2	15.0
Karnataka	48.3	38.14	10.16
Kerala	47.0	32.08	14.92
Tamilnadu	52.1	45.13	6.97
India	48.1	39.34	8.76

From the above details we may infer that CPS along with other similar rural development programmes has resulted in substantial reduction in the percentage of people living below the poverty line. Excepting for Tamilnadu the progress has been impressive and much above the national average.

SUGGESTIONS TO MAKE CPS MORE EFFECTIVE.

When the CPS was introduced in 35 polytechnics initially in 1978-79 in the country the coverage was only 11 in the southern region. As on April 1996 in India we have 375 polytechnics having the CPS, out of which 117 are in Southern region. Over the last 18 years the coverage has exceeded more than ten times in the country and in the region. Prompted by success the Government is keen to bring more polytechnics to implement CPS. In order to make the scheme more effective the following suggestions may be considered by authorities concerned.

1. In each polytechnic operating CPS a full time project officer with qualifications such as M.A., (Rural Economics), M.A., (Rural Sociology), M.Sc., (Rural Development). M.A., (Social Work), M.R. Tech (Master of Rural Technology) be appointed in a grade equivalent to that of Lecturer. As these qualified are already familiar with the objectives of the scheme their competence and commitment can be fully utilized. Their concern for rural development as a career and penchant for working with rural people in villages needs no mention. If they are allowed to function together with other technical staff involved in them they can also succeed in arousing similar attitudes and liking for rural development efforts. This if implemented will pave way for career prospects for these people and more job opportunities.

2. Production cum sales centers can be opened in polytechnics implementing CPS. Those trained by them can produce consumer goods such as pickles, garments, agarbathis, juices, jam, pappads, soaps, toys, etc., and these can be marketed. Also the trained youth when they manufacture them can sell them through khadi and Village Industries, Cooperative Societies which can be arranged. If needed District level Marketing Societies can be set up. The Khadi and Village Industries Commission (KVIC) can support their skills by encouraging them to produce such commodities for daily use.

3. Entrepreneur development programmes (EDP) can be periodically organised by polytechnics offering CPS. They can give retraining after 2 to 3 years for self employed entrepreneurs. If such camps are organised it can also be attended by the final year diploma and post-diploma students who can be motivated for entrepreneurial abilities.

4. In order to provide scope for further training and knowledge updating for the already trained entrepreneurs of CPS higher technical institutions and Technical Teachers Training Institutes (TTTI) can organise courses under continuing education programmes to cover areas such as Rural Architecture, Rural Mechanics, Rural Sanitation, Energy for Rural areas to mention a few. The TTTIs which are involved in monitoring the implementation of CPS can give a lead in organizing such courses. To make these a reality suitable nonformal/distance education courses in the above areas needs to be commenced.

5. Efforts can also be made to accredit the courses offered by the polytechnics under CPS.

6. If the management of the aided institutions which have been implementing the CPS for more than 16 years come forward to share a portion of the expenditure from their trust the Government can think of giving matching grants rather than full support. This if given effect will help the Government to reallocate the grants to other institutions there by extending it to cover more areas.

7. The industries in rural areas can give indirect employment to the trained rural youth absorbing them to market their products in villages surrounded by them.

8. Datt and Sundharam (1997) say "India ranks quite low in the degree of urbanisation". Our country still can pinch its hopes on rural transformation and betterment to support the larger rural population. It is reported that by 2000 AD the labour force is projected to be of 379.85 million of which 264.33 millions rural (70%) and 115.52 million (30%) in urban areas. In order to give a push to their upgradation and economic improvement more rural based cost effective cum labour intensive technologies have to be propagated. Still ruralites have the feeling that their relatively low purchasing power will not allow them to move to urban centers and they are afraid of cosy living in new places.

The Government can also think of launching programmes similar to CPS to involve other subsystems of education also to brighten the lives of rural poor before the turn of the century. Hence rural entrepreneurship needs more support to equip rural people get employed and earn their living.

9. The focus in CPS should be to promote rural entrepreneurship to meet the labour requirements of cottage, village, tiny

Issue '96

61

RESEARCH ABSTRACT

V. THANIKACHALAM, An Evaluation of Continuing Education Cells in Polytechnics in the Southern Region

Under World Bank Assisted Project — (WBAP) three Southern States have established continuing education centres at the State level and cells at selected Polytechnics. Tamil Nadu planned 55 polytechnic based cells, Karnataka — 10 cells, Kerala — 29 cells. It is found that some of the cells and centres are not very active. Hence a study to evaluate the functioning of the cells was undertaken.

Objectives of the Study:

1. To review the functioning of the continuing education centres at the state level.

2. To review the functioning of the continuing education cells at the Polytechnic level.

3. To identify the weak spots in the planning, organising and evaluating the centres/cells.

Methodology:

Reviewing the quarterly monitoring reports to National Project Implementation Unit.

Findings:

- 24% of the Polytechnics in Kerala are conducting continuing education programmes.

- 40% of the Polytechnics in Karnataka are conducting continuing education programmes.

- 42% of the Project Polytechnics are offering continuing education programmes in Tamil Nadu.

One long-term programme leading to AMIE is being offered in three polytechnics.

The following programmes are offered in Kerala:

- Computer Programming

- Office Automation

- TV and VCR Servicing

- Electrical Wireman

- Electrical Home Appliance and Maintenance

The following programmes are offered in Karnataka:

- Computer Programming

- TV Servicing

- Electrical Motor Rewinding

- Domestic Electrical Wiring

- CNC Machines

- Welding and Sheet Metal

- Automobile Driving

- Automobile Servicing

- Typewriter Mechanism

The following programmes are offered in Tamilnadu:

- CAD Applications

- Computer Maintenance

- Micro-computer Applications

- Electrical Wiring

- Plumbing

- Accountancy

- Desk Top Publishing

- Offset Printing

- Bakery and Confectionery

- Welding

- CNC Programming

The Polytechnics have started continuing education cells for training the personnel from the industry as these institutions are equipped with modern laboratory facilities under the ongoing projects.

The following areas need immediate attention:

1. Performing needs analysis

2. Development of programmes and estimates

3. Preparation of training programme

4. Conduct of training programme

5. Alternate strategies for effective implementation

6. Standardisation of Course packages at state level

7. Evaluation of training programmes, cells and centres.

By providing suitable guidance document and training, the polytechnics could further develop their strength for the implementation of the continuing education programmes.

ABOUT OUR CONTRIBUTORS

AFUGBUOM UCHE, J. is currently a Lecturer in the Division of General Studies, Federal Polytechnic, Oko, Nigeria. She holds a B.Sc. Ed., (Hons) Degree from the University of Nigeria, M.Ed., (Hons) Degree from Abia State University. She is a member of many professional bodies.

ARUNKUMAR, P. holds M.Sc. (Chemistry), M.Ed., and Ph.D., in Education. He is Assistant Professor of Educational Management, TTTI(SR) Madras 113.

BEDI, Mrs. S.P. holds M.Sc. M.Ed., and Ph.D., degrees. She is Assistant Professor in the Department of Education and Educational Management, TTTI (N.R.) Chandigarh 160019, India. She has published a number of papers and research reports.

BIJUVARGHESE has M.Sc. (Mathematics) and M.Ed., degrees. He is a doctoral fellow in TTTI (SR) Madras 113.

CHEN–JUNG, TIEN is Professor at Institute of Industrial Education in National Taiwan Normal University

CHIN–LUNG, TANG is Teacher in Taipei Municipal Noh-Kang Technical High School.

MUKHOPADHYAY, B. is currently Professor of Educational Management, TTTI (SR) Madras. He holds Ph.D., in Education and PG Diploma in Personal Management. His Research interest are in the areas of Counselling Psychology and Motivation.

NARAYANA RAO, M. holds Ph.D in Civil Engineering and is at present Principal, TTTI (SR) Madras 113. His areas of interest are Educational Administration and Environmental Engineering.

OCHUBA, OGUGUA, E. is currently a Lecturer in the Division of General Studies, Federal Polytechnic, Oko, Nigeria. She holds B.Sc. Ed. (Hons) Degree from the University of Nigeria, Nsukka, M.Ed., (Hons) Degree from Abia State University; and is a member of WEF.

ODUNUKWE, G.E. is currently a Lecturer in the school of Continuing Education, Federal Polytechnic, Oko, Nigeria. He holds the following qualifications. B.Sc (Hons) Nigeria in Zoology, Post Graduate Diploma in Education, and M.Ed (Nigeria) in Educational Psychology. He is also a member of two professional bodies — Technological Writers Association of Nigeria (TEWAN) and Science Teachers' Association of Nigeria (STAN). His research interests are in the areas of Psychopathology and Technical Education.

SAXTON BARRIE, J. has a Master's Degree in Education from the University of Toronto and a B.A., from New York University. He has been involved in Post Secondary education in Canada for the last 25 years. At present he is on a three year assignment in India as Project Manager, Canada India Institutional Co-operation Project, TTTI campus, Madras 113. He has got distinguished international experience in Educational Administration and Management.

SRINIVASAN, R. holds a Ph.D., in Education. He is at present Assistant Professor of Education, TTTI (SR) Madras 113.

CALL FOR CONTRIBUTIONS

Contributors are invited to send their papers for publication in the next issue No. 14/1997 before 31 May 1997.

This journal is priced as follows:

	India	Other Countries
Annual Subscription	Rs.50/-	10/- US $
For Five Years (5 issues)	Rs.200/-	40/- US $
Month of Publication		Every December

Subscription by D.D. favouring the Principal T.T.T.I. Madras, to be drawn on Indian Overseas Bank, Madras, India.