EDITORIAL

We are glad to bring out Volume 22 No.2 of the Journal of Technical and Vocational Education and we thank the authors for their valuable contribution. All the articles and research papers in this volume will be of great interest to our readers.

Educational Institutions need to adopt performance management practices. Shri. Sarma and Prof. Mukhopadhyay in their paper have discussed about the Balanced Scorecard methodology, which is the latest in performance management.

Shri. Vijayaram in his paper titled "Evaluation on the Entrepreneurial Skills of Engineering Students", has described the study undertaken by him to evaluate the entrepreneurial Skills of engineering students. The paper details the suggestions to the students to enhance their entrepreneurial skills.

For educational leaders, there are various levels of acting ethically. Prof. Jaiprakash Narain, in his article on Ethical Educational Leadership has described the various levels of ethical functioning, the relationship and influence among the levels, and the virtues of educational leaders.

Shri. Sundaramoorthy and Prof. Sambanthan have discussed their efforts to make a Content Analysis on Non-Formal Computer Hardware Course Curricula. The results of the study would be highly useful to curriculum developers.

Laboratory development is the most important aspect of Institutional development. Prof. Anuradha De in her article on "Laboratory Development" has described the stages involved in Laboratory Development.

The article titled "Enhancing Peace Education through Home Economics Programme in Nigeria" by Shri. Uzo, discusses the ways in which peace education can be promoted through Home Economics.

There has been a decline in the number of students opting for vocational education in Nigeria due to the attitude that vocational subjects are meant for the children of the poor. Shri. Ozioma has discussed about the factors that influence the study of vocational subjects in Nigeria.

Dr. Lahijanian has presented her research study on "Environmentalism in Technical Education Curriculum in India and Iran". The study enabled the identification of recommendations to Principals, Technical Administrators and Faculty of India and Iran.

Dr. Sivakumar and Prof. Brahadeeswaran have presented the abstract of the research study on "Development and Validation of Computer Based Multimedia Learning Package on Electromagnetism". The study enabled the identification of recommendations to Polytechnics, DTE's, NITTTRs, AICTE and MHRD for improving the effectiveness of the teaching learning process through the use of CBMMLPs.

We once again acknowledge the contributions of the authors for this present volume. We welcome papers and research articles for our future issues.

– Editor

JOURNAL OF TECHNICAL AND VOCATIONAL EDUCATION

CONTENTS

Balanced Scorecard - A Performance Management Model for Creating Excellence in Academic Institutions

SARMA M.V.K and   . B.MUKHOPADHYAY

INTRODUCTION

Educational Institutions' main role has been to impart knowledge on a particular domain. Education being the major means of earning livelihood. Educational institutions needs to ensure that the students are employable at the end of the day. Interestingly there exists a paradoxical situation today, where on one hand we have double-digit unemployment rate and on the other the software industry is talking about shortage of required manpower. In these days of rapidly changing technologies, methodologies and culture, it is time educational institutions also come into grips with the situation and play a vital role in enhancing the growth of the country. To do so, educational institutions can look into the best practices of industry and adapt a few of them for improvements. One of the key best practices that the educational institutions can adopt is the "Performance Management". Educational institutions need to measure, monitor and manage their performance more aggressively to be more efficient and effective in meeting the industry requirements.

This paper describes what are Performance Management Systems, different flavors of Performance Systems and one popular system is taken up for its relevancy in educational institutions.

PERFORMANCE MANAGEMENT SYSTEMS:

Competition [1] is at the core of every business. It determines the success or failure of the organization, Building competitive strategy is the search for a favorable competition position in an industry. One of key methodologies for arriving at the competitive strategy is to have good performance management systems. Performance Management, from an industrial perspective, is involved in setting goals and standards and act as a driver to organizational excellence. Performance Management is the process of assessing progress toward achieving predetermined goals, including information on the efficiency with which resources are transformed into goods and services (outputs), the quality of those outputs (how well they are delivered to clients and the extent to which clients are satisfied) and outcomes (the results of a program activity compared to its intended purpose).

There are very many performance systems used by the industry like, Economic Value added, Activity based Cost management, Management by Objectives, Quantitative performance appraisals etc. Of the many mentioned performance management systems, this paper will describe in detail Balanced Score card [BSC] [2] methodology, which is latest in industry implementations and

discuss the relevance of same to educational institutions.

BSC: INDUSTRY PERSPECTIVE

From Industrial revolution, we are moving into a second revolution called Information revolution. During Industrial revolution companies succeed by building huge assets for achieving economies of scale and scope. Capital investment and efficient use of Capital were the main inputs to drive profits. Information revolution has changed the landscape of business. Also device industries have grown faster than brick & mortar companies. For both service and manufacturing industries, the information age environment demands new set of abilities for competitiveness. The ability of a company to mobilize and exploit intangibles, are far more important that the tangibles like physical assets. Also the operating environment has changed in the following manner:

- People need to work as cross-functional teams for more organizational effectiveness than specialized teams.

- The competition is between Supply Chains rather than individual organizations

- Customer preferences are unique; no longer mass production is acceptable.

- Globalization has become pervasive. Product life cycles have drastically shortened.

- With labour costs going through the roof tops and complicated with stringent government laws, automation of physical activities has taken place, driving the need for learned workers.

- Emphasis is on both short-term financial results and long-term growth of the company.

With the operating environment taking a paradigm shift, the need for redefining, measuring and management of success also needs to change. Strategic management [3] can be defined as the art and science of formulating, implementing, and evaluating cross-functional decisions that enable an organization to achieve its objectives. Companies to be successful in this art need to adopt newer methodologies of measurement and strategy formulation systems. To bring a balance across all the above-mentioned conflicting scenarios, Robert Kaplan and David Norton of Harvard University have proposed a new measurement system called Balanced Scorecard (BSC). BSC translates an organization's mission and strategy into a comprehensive set of performance measures (also called as Key Performance Indicators-KPIs) that provides the framework for a strategic measurement and management system. The Balanced Scorecard measures organizational performance across four perspectives viz., Financial, Customer, Internal business process and Learning's & Growth. This helps in monitoring not only the short-term financial results but also progress of capabilities unit's mission and strategy into tangible objectives and measures. The measures represent a balance between external measures for stakeholders and customers, and internal measures of business process and learning's and growth. BSC helps organizations in being able to translate organization's vision clearly into strategy and forms a powerful communicative tool across the organization. The structure of BSC is as follows:

- Across the four perspectives identify the critical success factors viz., Stakeholder, Customer, Internal Business process and Learnings & Growth.

- Across the critical success factors identify the key performance indicators (KPI) for achievement of critical success factors.

- Build a cause - effect relationships among KPIs across all perspectives

- Set targets for each of the KPIs

- Monitor at a predetermined frequency the variance between plan & actual.

- Take appropriate actions based on actual values

- Analyze over a period the performance of each of the KPIs

- Take appropriate actions based on analyzed data, possibly revise the initial targets

BSC: EDUCATIONAL INSTITUTIONS PRESPECTIVE

Based on the developments happening in the industry, the current and future people requirements are changing rapidly. High velocity delivery, exceptional quality solutions at the lowest cost is the demand of the day. To meet these stringent requirements people need to be well versed with the latest technologies, methodologies in depth and also in breadth. People need to be multi skilled and versatile.

Thus, it is imperative that our educational institutions need to be delivering the required number of people equipped with sufficient skills for 21st century companies.

Based on the above scenario, the key objective of educational institutions is to develop the future citizens of country who could be highly productive and will also have the capabilities to dream and transform the dreams, into realities so as to shape a better tomorrow for the country's future.

To achieve the above objective, the educational institutions need to have excellent process for selection, training, infrastructure, trained & experienced faculty, in addition be supported well enough by the governmental policies, industries & employable agencies and also the parents at large. To meet this objective is no mean task. It is estimated that there will a large gap in recruitment of competent people in IT sector due to inadequate number of students qualifying for the post. There are very few institutes of international repute who could only meet the demanding requirements of the industry.

What gets measured, get's done. To meet the requirements of the industry and the objective set, it is imperative that a proper measurement system be instituted for educational institutions. One such methodology is Balanced Score Card. This concept and usage in industry is widespread and helped many organizations to be extremely successful.

Employment of the four perspectives of BSC for educational institutions is described below:

1. Stake holder:

The government and parents are the key stakeholders. Parents provide the supply of future citizens who desire to make their children extremely competitive in various areas. The government would like to utilize the children talents for the growth of the country. The quality of the citizens determines the health of the country. It is thus important for the educational institutions to meet the expectations of both these entities completely.

2. Customers

The educated students are absorbed by the industry and other employable agencies like government etc., who put these students through productive use. These agencies provide the necessary opportunities and challenges, a kind of platform / stage for the students to exhibit their talents, skills and capabilities, thereby ensuring their growth and overall organizational goals.

Educational institutions needs to meet the expectations of the industry in terms of providing well-educated and trained people who could, be productively employed at the shortest possible time.

3. Internal Process:

Internal processes of the institutions should include provision of good infrastructure & facilities, excellent selection process of students, providing a learning environment, impeccable evaluation criteria, providing for all round development of students and imparting good ethical & moral values.

4. Learning's and growth:

To realize the above-mentioned four perspectives, it is important that the institutes have excellent well-qualified and experienced faculty. Faculty selection and training are important facets. Continuous up gradation of teacher's skills, knowledge and imparting newer teaching methodologies could be some of the important things to be practiced.

The next steps are to:

➤ Decide and arrive at the critical success factors across each perspective.

➤ Decide and arrive at key performance indicators (KPIs) across each critical success factor.

➤ Build a cause-effect relationship across KPIs.

➤ Set targets for each of the above identified KPIs

➤ Monitor the actual performance at a pre determined frequency

➤ Take actions based on variance analysis

SUMMARY

What cannot be expressed in numbers can never be understood. What cannot be understood can never be improved. Given the external scenario of globalization, extreme competition across companies, stiffer compliance rules, organizations are forced to adopt new methods of measurement, monitoring and analysis. Driven from this need every organization's dream is to have an extremely capable workforce. Educational institutions need to take cognizance of these developments and orient themselves to fit to the industry demands. Educational institutions can adopt some of the best practices followed by the industry for their own survival & growth. One such methodology is the Balanced scorecard methodology. The figment to BSC has been explained above and if implemented with diligence and commitment, educational institutions also can reap the benefits

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Evaluation on the Entrepreneurial Skills of Engineering Students

THOGULUVA RAGHAVAN VIJAYARAM

ABSTRACT

This technical article is based on the evaluation and critical analysis of the entrepreneurial skills and abilities of the students of all the disciplines of engineering. The assessment and analysis is done by considering the crucial factors and variables like higher studies, research, self-employment opportunities, government and private jobs options, consultancy, own industry starting, looking after parents' business, other constraints like the availability of funds for higher studies and starting industries, managerial skills, lack of opportunities, risk taking and other parameters based on the analysis of seminars, technical quizzes, competitions and industrial visits. A standard questionnaire is prepared and distributed to all the engineering students of all the branches of a reputed Indian engineering institution selected for this research work and the results are analyzed based on their response from the quantification of the above-mentioned parameters. Student's innovative ideas are also highlighted and the same is assessed from their comments and the difficulties in implementation are found out for commercialization purpose. In this paper, suitable suggestions are given to the students to enhance their entrepreneurial skills by this comparative study of the students of all disciplines.

Keywords: entrepreneurship; assessment; questionnaire; innovative ideas; entrepreneur skills; data collection mode.

Introduction

Development of entrepreneurial skills of the engineering students depends upon the quality and standard technical education imparted to them by the engineering institutions. Students may gain innovative ideas by acquiring more knowledge by going through technical books and journals. But, the implementation of their practical ideas is somewhat difficult, unless they gain sufficient practical training in their areas of interest in the engineering field. Presently, in most of the engineering colleges, due to the deficiency of laboratory equipments and facilities, they find it difficult to teach practical aspects by demonstration and illustrations of the functioning of the devices and machineries [1]. So, particularly in this technical paper the author made a strong conclusion by analyzing the results and comments from the students of all the engineering disciplines through the standard questionnaire prepared and distributed to them for this specific entrepreneurial skill development analysis.

Design of a standard questionnaire for the purpose of analysis of entrepreneur skills

A format of the questionnaire is designed by considering some important

parameters. Basically, the name of the candidate, branch of the engineering and their chosen variables among the choices is considered for the analysis. It is designed like an objective answer type and this helped us to identify very easily. This standard format is distributed randomly to students and the information is gathered [2]. A sample of the standard questionnaire is given in this article to get a clear idea.

Data collection & Data analysis

The data collected is entered in a standard format designed for this purpose. Approximately 30 variables are considered for this and all the quantified values are entered. The data collected for the departments of production, mechanical and electronics and communication engineering are analyzed in order to get a conclusion [2].

Even important variables which highly influence in evaluating the entrepreneurial skills of the engineering students are taken into consideration. From the analysis it is found that the crucial variables mentioned below are considered most and helped us in studying the entrepreneurial skills of the engineering departments [3].

- Higher studies
- Research
- Private jobs
- Government jobs
- Self employment
- Foreign university
- Indian university
- Software
- Parents business
- Funds constraints
- Creative ability

Questionnaire

The questionnaire used in this analysis based on the details of the student is listed below:

- Name of student :
- Semester Number :
- Branch :

List of questions

1. On graduation, what will be your option? Go for higher studies and Research or Do job in a Private or in a Government concern or otherwise self-employed

2. If higher studies do you want to continue in a foreign university or in an Indian University

3. If self employed what type of job will you choose?

   Consultancy Software or own an industry or undertake parents' field Business

4. What are the difficulties in achieving your goal?

(A) **Higher studies:** Less marks scored, Less availability of seats, Fund constraints and Family ties

(B) **Research:** Lack of facilities in India, Difficulty in getting admissions in foreign Universities, Fund constraints and Less demand for research people in industry

(C) **Self employment:** Lack of funds, Lack of ideas, Lack of managerial skills, Lack of opportunity, Need for safety and Family constrains

5. Do you have any innovative idea, which can be commercialized?

6. What should be done to commercialize your ideas?

   (i) Funds required by indicating the amount

   (ii) Support from family

   (iii) Unable to take risk

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(iv) College should help

(v) Government should help

(vi) Banks and financial help

7. What are the other difficulties you face to become an entrepreneur?

8. Is our engineering curriculum encouraging creative abilities?

9. List your suggestions for encouraging creative abilities among engineering students

Report on the analysis of production engineering department data

Based on the analysis of the data collected from the currently pursuing final year production engineering students of the academic year 2002, it is found that most of the students wished to pursue higher studies in Indian universities. Only a few are interested in pursuing postgraduate research studies in foreign universities due to the lack of availability of funds to pursue the same and also due to the lack of emphasis and opportunities after their studies abroad. A group of students stated that getting admissions in foreign universities is difficult for them and so they need good English language training for the English language proficiency entry courses like TOEFL, GRE, TSE, SUBJECT-GRE and IELTS. Interest for software job is lesser now in the students. Some students are interested to take jobs in public sector and government firms and for them they are all dream jobs accordingly. The reason for not going for research studies is that the less demand for the opportunities for research people in industries and this is a strong conclusion by them. Family constraints are lesser. They don't want to start their own industry due to the competition existing in the industry market and so becoming an entrepreneur is of less chance to them. Their

crucial suggestions are, the college has to make necessary arrangements to conduct seminars, technical workshops, quizzes, technical competitions, industrial visits, in plant training. Besides, they feel that the laboratory facilities in the department must be improved.

Report on the analysis of mechanical engineering department data

Based on the analysis of the data collected from the currently pursuing final year mechanical engineering students of the academic year 2002, it is found that most of the student's wished to pursue higher studies and it is really appealing. It's a remarkable percentage of response from the mechanical engineering students. Only a few students of their department shown the interest to join in foreign universities. Mostly 90% of the students are interested in pursuing postgraduate higher studies in Indian universities. The reason for not showing interest to do research studies, (only 25%) abroad is due to the lack of availability of funds to pursue the same and also due to the lack of emphasis and opportunities after their studies abroad, another important factor is that due to the less availability of seats and lesser marks scored in the qualifying exams plays a vital role for not securing admissions abroad. A group of students stated that getting admissions in foreign universities is difficult for them as they need good English language training for the English language proficiency entry courses like TOEFL, TSE, SUBJECT-GRE AND IELTS. Interest for software job is lesser in by the students. Students are not so much interested to take jobs in public sector and government firms. The reason for not going for research studies is that the less demand for the opportunities for research people in industries and this is a

strong conclusion by them. Family constraints are lesser. They don't want to start their own industry due to the competition existing in the industry market and so becoming an entrepreneur is of less chance to them. As per the analysis, most of the present curriculum enhances very little creative abilities. Their crucial suggestions are as follows: the college has to make necessary arrangements to conduct seminars, technical workshops, quizzes, technical competitions, industrial visits, inplant training. Besides, they feel that the laboratory facilities in the department must be improved.

Report on the analysis of electronics and communication engineering department data

Based on the analysis of the data collected from the currently pursuing final year electronics and communication engineering students of the academic year 2002, it is found that most of the students wished to pursue higher studies and it is really appealing, (nearly 50% of the students of the ECE engg branch). It's a remarkable percentage of response from the ECE engineering students. Students have shown their interest equally to join in foreign universities and as well as in Indian universities. Pursuing postgraduate research studies either in Indian or foreign universities is negligible as per their response. The reason for not showing interest to do research studies, (only 25%) abroad is due to the lack of availability of funds to pursue the same and also due to the lack of emphasis and opportunities after their study abroad. Another important factor is that due to the less availability of seats and lesser marks scored in the qualifying exams plays a vital role for not securing admissions in abroad. Fund constraints are more according to them. They feel that they should get loans from banking

sectors to commercialise their ideas for implementation in industries. Students have not stated any difficulty in getting admissions in foreign universities. Interest for software job is lesser in the students. Students are not so much interested to take jobs in public sector and government firms. When compared government jobs, they prefer to go for private jobs. The reason for not going for research studies is that the less demand for the opportunities for research people in industries and this is a strong conclusion by them. Family constraints are lesser. They don't want to start their own industry due to the competition existing in the industry market and so becoming an entrepreneur is of less chance to them. As per the analysis, most of the present curriculum enhances very little creative abilities. Their crucial suggestions are as follows: the college has to make necessary arrangements to conduct seminars, technical workshops, quizzes, technical competitions, industrial visits, inplant training. Besides, they feel that the laboratory facilities in the department must be improved. According to their conclusion, they get too little creative abilities from the present curriculum.

Results and Discussions

The results are depicted in Fig. 1. The numbers in the x-axis represent the following

1. Higher Studies
2. Research
3. Private Jobs
4. Government Jobs
5. Self Employment
6. Foreign University
7. Indian University
8. Software
9. Parents Business
10. Funds Constraints
11. Creative Ability
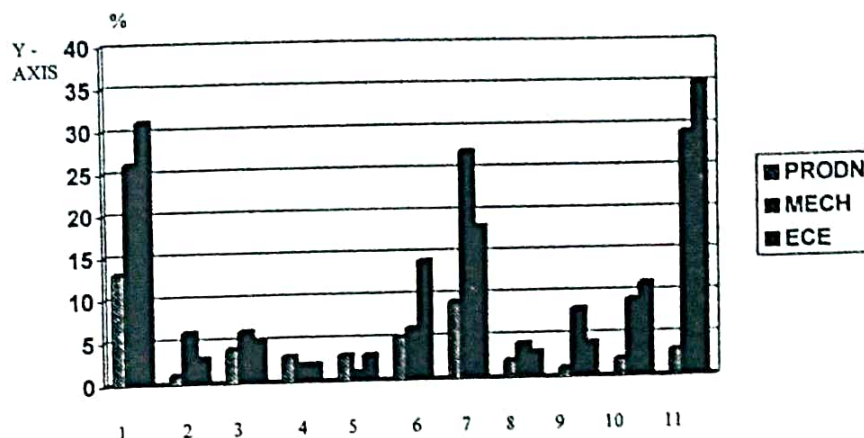
Fig. Histogram (Bar Chart)

It is found that the students of the mechanical engineering department has shown much interest in pursuing higher studies. Next comes the electronics and communication-engineering department. In particular, all the department students have shown very less interest in pursuing research studies and what they felt is that there are lesser opportunities for jobs in industries. The mechanical engineering students prefer to pursue their higher educational studies in Indian universities and is nearly 50%. Other aspects for going to software jobs, government and private jobs are considered very less by the students of all the three engineering departments. All the three engineering departments pointed out strongly that the present curriculum enhances only lesser creative abilities.

Conclusion

To conclude, more practical training should be given to the students in technical institutions by providing more laboratory facilities and arranging for inplant training atleast a month to the students in engineering industries.

Special purpose machines should be designed and if not, purchased to get hands on experience by operating it. These facilities definitely helps the engineering students to develop entrepreneur skills to the peak level and finally help them in starting industries of their own.

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Ethical Educational Leadership

G.B. JAIPRAKASH NARAIN

1.0 INTRODUCTION

There is a deeper substratum of ethical issues, which activate foundational virtues for educational leaders, and a necessary distinction of levels of enactment of these virtues. In this paper an ethical framework for educational leadership is presented which will enable to face the challenges of leadership in the present context of reform and renewal in institutions.

2.0 LEVELS OF ETHICAL FUNCTIONING

For educational leaders, there are various levels of acting ethically. The *first and most basic level* of ethical enactment is as a *"human being"*. At this level, an educational leader considers what the humanly ethical thing to do might be. When dealing with another human being, an educational leader has to take into account the intrinsic humanity of that other person. Humans have to observe considerable delicacy and diplomacy in dealing with one another, for there is a basic level of respect and sacredness with which humans deserve to be treated.

The *second level* of ethical enactment for an educational leader is as a *"citizen-public servant"*. As a citizen, he has to respect the rights of fellow citizens. As a citizen-public servant, he acts for the good of fellow citizens; seeks the common good, rather than own benefit, or the benefit of one person at the expense of others. As a citizen-public

servant, he is entrusted with responsibilities to provide certain services to the public.

The *third level* of ethical enactment for educational leaders is as an *"educator"*. At this level, the educator has specific responsibilities to know the material in the curriculum in sufficient depth so as to understand the multiple applications and uses, that knowledge provides to the community. He is familiar with the most recent advances in the various academic disciplines in the curriculum.

Educators who fail to insist on the integrity of knowledge with their students can be accused of a kind of ethical laxity.

As educational leaders, they will see to it through their hiring, evaluation and professional development programmes that (1) teachers will know well the curriculum they are expected to teach and the academic disciplines that stand behind that curriculum; (2) they will know how to communicate that curriculum in a variety of ways that enable youngsters to comprehend and appreciate the many facets of what they are studying (3) they will insist that students take away from their learning important life lessons that will shape how they look upon the natural and social worlds, and appreciate the human adventure more deeply because of their studies; and (4) they will know their students well, and therefore can support the learning tasks to

respond to the background, interests and prior experience of their students. By cultivating these aspects of teaching and learning, educational leaders will be enacting the level of ethics involving them as educators.

The *fourth level* of ethical enactment by an educational leader is as an *"educational administrator"*. As an administrator the leader has access to the levers of organizational structures and processes that affect the core work of teaching and learning. These structures and processes are not ethically neutral. Often they work to the advantage of some students, and to the disadvantage of other students. Educational administrators who refuse to risk changing the organizational structures and processes might be accused of ethical laziness in the face of the evidence of how these arrangements discriminate against some or indeed, most of the students.

The *fifth level* of ethical enactment involves the educational administrator as a *"leader"*. Much of the ethical activity in the four earlier levels involves a kind of transactional ethic. This fifth level involves more of a transformational ethic. Transactional ethics tends to focus on some kind of exchange agreement: I will commit to provide you this, if in return you agree to provide me that. It is mostly a form of contractual justice.

Transformational ethics, on the other hand, involves the educational leader in calling students and teachers to reach beyond self-interest for some higher ideal, something heroic. The leader sees the potential of the people to make something special, something wonderful, something exceptional.

Leaders look for a kind of transforming teaching and learning, where students are changed by what they learn, changed into deeper, richer human beings who want to use their learning to make the world a better place.

At this level of ethical enactment, the leader is much more proactive than reactive. This is a distinctive, value-added ethic, an ethic that belongs particularly to leaders. Dealing with preventing harm to students and teachers, guaranteeing their security and safety, supporting contractual obligations out of a sense of justice.

3.0 MUTUAL INFLUENCE OF LEVELS OF ETHICAL ENACTMENT:

It is important to recognize that each of the five levels requires and absorbs the previous level in its full exercise, as **Fig.1** attempts to visualize.
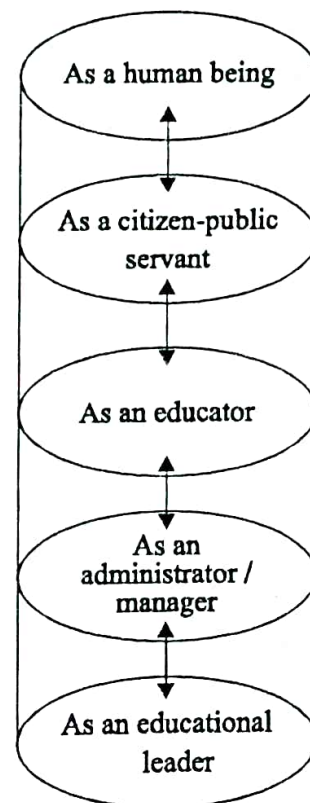

Fig. 1: The mutual relationship among the levels of ethical enactment

4.0 FOUNDATIONAL VIRTUES OF EDUCATIONAL LEADERS:

There are three virtues, the cultivation of which will energize and sustain the transformative ethics of an educational leader

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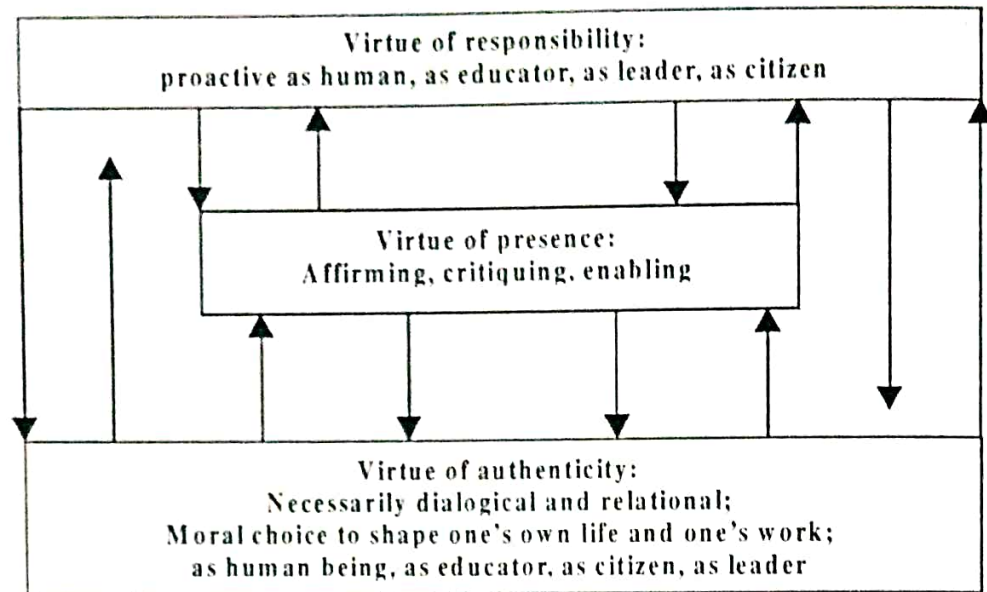
Fig. 2 Foundational ethics for educational leadership

– the virtues of responsibility, authenticity and presence. These virtues are foundational, that is, they are embedded in the work of an educational leader, in the context of an educating institution, in the core work of teaching and learning. Virtues are mutually inter-twined, with each one activating and being activated by the other, as **Fig.2** attempts to visualize.

There is a dynamic logic and grammar to the relationship among the virtues. Responsibility returns to authenticity for its subjective grounding and moral weight; authenticity through affirming and critical presence establishes the necessary dialogue with the other's authenticity or inauthenticity; authenticity seeks out its responsibility in expressing a positive or negative moral response. Presence is the medium, the between of authenticity and responsibility. Authenticity needs both presence and responsibility; responsibility expresses both presence and authenticity. The three virtues interpenetrate and complement each other.

Further those virtues being applied to five dimensions within the situation of institute; the human dimension, the civic dimension, the academic dimension, the administrative dimension and the leadership dimension. Thus, an ethical educational leader has to be responsible for all five dimensions, has to be present to all five dimensions, and has to be authentic within all five dimensions.

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Content Analysis on Non-formal Computer Hardware Course Curricula

K.SUNDARAMOORTHY and T.G.SAMBANTHAN

INTRODUCTION

Over 80% of the Technical and Vocational trades are found in the non-formal sectors in India. They are innumerable in trades, such as Electrical gadget repairs, Consumer electrical and electronic instrument repairs, auto-mechanics, TV repairs, Electronic hardware maintenance, Computer hardware services and so on. In the year 1978, Government of India (2001) introduced Community Polytechnic Scheme (CPS), to offer vocational programmes in these non-formal technical trades, to improve the socio-economic conditions of the rural youth, women, school drop-outs and other weaker sections and under-privileged groups in the society. In addition to the above non-formal trades, it is estimated that there are over 50,000 non-formal computer education institutes (both Organized and Un-organized) in India. Most of these institutes conduct software and hardware (mostly computer servicing) courses. In March 2001, Government of India circulated to various technical institutes under its purview, to study the level of competencies in such institutes.

It is found that the existing curricula of these various trades do not include components related to their main educational objectives of the intended programmes. One of the main functions of this scheme is to prepare the syllabus content of each trade according to its educational objective.

This paper attempts to make a content analysis on the presence of competencies pertaining to the educational objectives in the Cognitive and the Psychomotor domains of these programmes. However the study would be limited to the computer hardware courses conducted by some Computer Polytechnic colleges of Tamil Nadu and by a few selected privately run Computer Institutes in Tamil Nadu. Out of 203 Polytechnic colleges in Tamil Nadu, 65 Polytechnic colleges come under this scheme. Out of hundreds of privately run computer educational institutes a few scores of institutes offer Computer hardware trades. Haider (2000) has reported that many institutes do not have proper curriculum developed for various trades. Hence the analysis would be limited to those institutes, which have developed and presented the course syllabi.

DATA COLLECTION

Out of the 65 community polytechnic colleges, 5 Polytechnic colleges who offer Computer Hardware course under the Community Polytechnic Scheme and also who have developed curriculum for this course have been taken for the content analysis. In addition, 10 well-organized computer hardware training courses offered by privately run non-formal computer educational institutes, who have developed course curriculum, have also been taken for the

content analysis. The subject is restricted to 'Computer Hardware Maintenance'.

The sampling is based on 'Purposive sampling'. This sampling is selected by some arbitrary method, because it is known to be representative of the total required data, or it is known that it will produce well-matched groups. The samples are distributed in the state of Tamil Nadu, which include urban and rural areas. The samples also include government run institutes and privately run institutes of both well-organized and un-organized sectors.

The module, is the actual, course handout pertaining to the subject 'Computer Hardware Maintenance' offered by the above sample institutes. They have been collected by the researcher with due permission from the authorities of the samples considered. The actual identity (including their names) has been deliberately omitted in this paper to maintain privacy.

CONTENT ANALYSIS

The content analysis was done pertaining to the presence of competency components in the 'Cognitive' as well as 'Psychomotor' domains. The competencies, which would be analysed for their presence in the respective course module, will include: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation of the cognitive domain and Imitation, Manipulation, Precision, Articulation and Naturalization of the psychomotor domain. Benjamin (1986) has elaborated these pedagogical taxonomies.

The subject content presented in these modules viz., the printed course handouts, has been analysed for the presence of permitted action verbs belonging to both the domains. The selected action verbs were taken from authorized sources (2005).

For the purpose of presenting the results of the analysis, the samples have been earmarked with notations viz., P1, P2, P3, P4 and P5 for the 5 Polytechnic colleges and I1, I2, I3 ... I10 for the 10 computer education institutes considered for the study.

ANALYSIS AND RESULTS

The presence of each competency component of both the domains in the course modules of the samples are presented in figures 1 to 11. The individual title shows the respective competency of the particular domain. The institutes, which have submitted their modules, are presented in abscissa and the presence of specific competency component of the domain is presented in ordinate in percentage of the total subject content.

In all the analytical results reported, it is found that large differences exist between the values of different variables. The difference between the lowest and the highest value of a sample variable is in the order of 5 to 35%. Hence for every analysis the average result is found by computing median instead of mean. The values of the median and the standard deviation for each analysis is presented below:
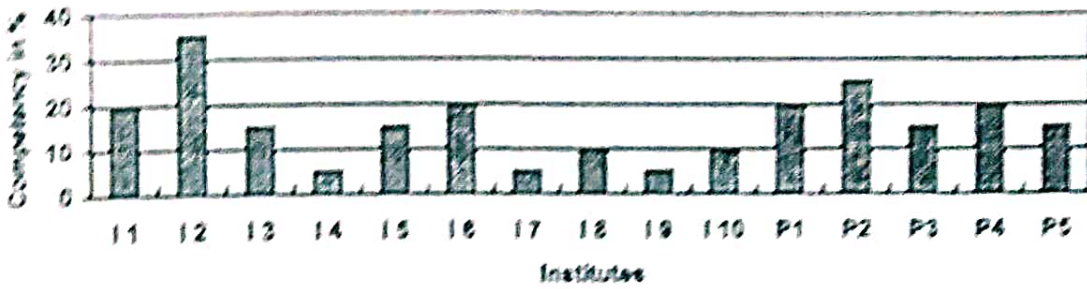
Fig. 1.   PRESENCE OF 'KNOWLEDGE' COMPETENCY
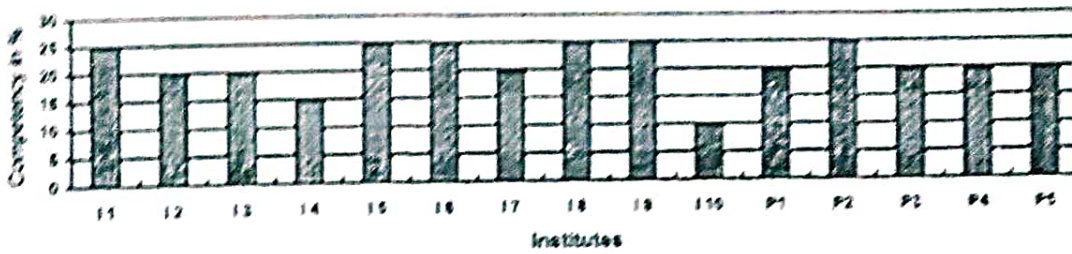
Fig. 2. PRESENCE OF 'COMPREHENSION' COMPETENCY
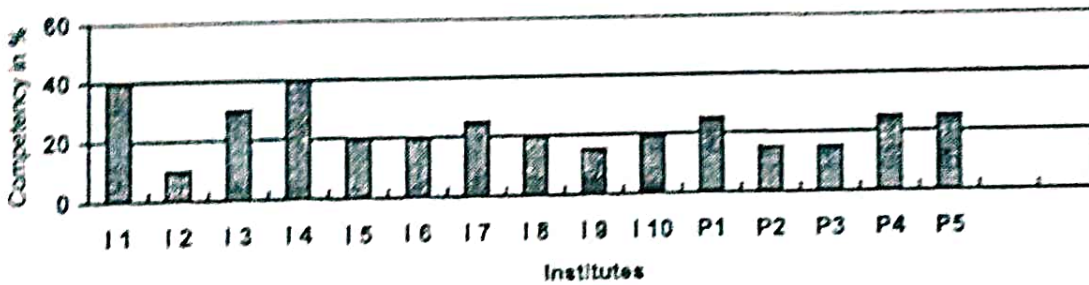
Fig. 3.   PRESENCE OF 'APPLICATION' COMPETENCY
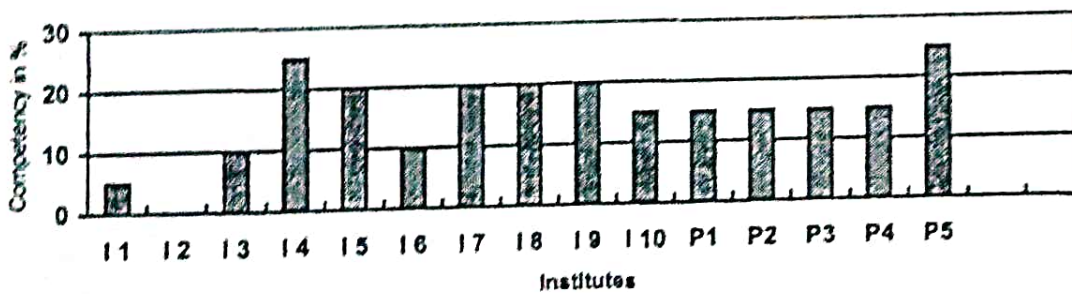
Fig. 4.   PRESENCE OF 'ANALYSIS' COMPETENCY
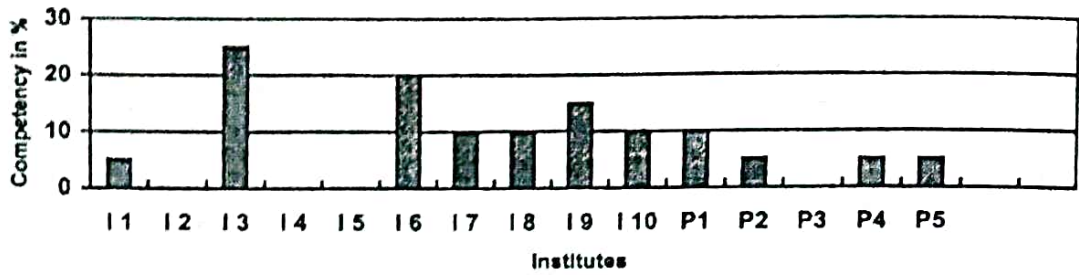
Fig. 5. PRESENCE OF 'SYNTHESIS' COMPETENCY
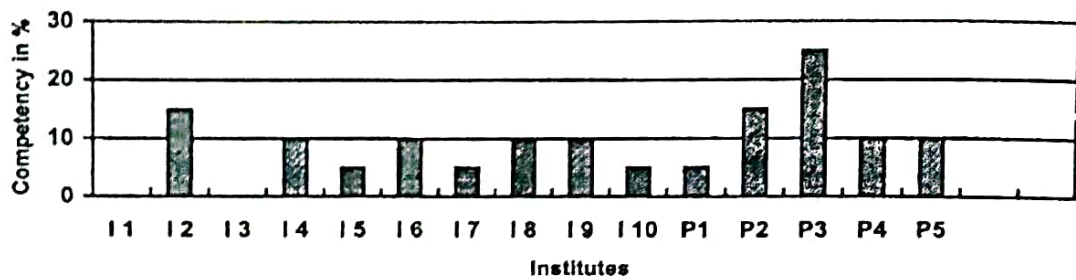
Fig. 6. PRESENCE OF 'EVALUATION' COMPETENCY
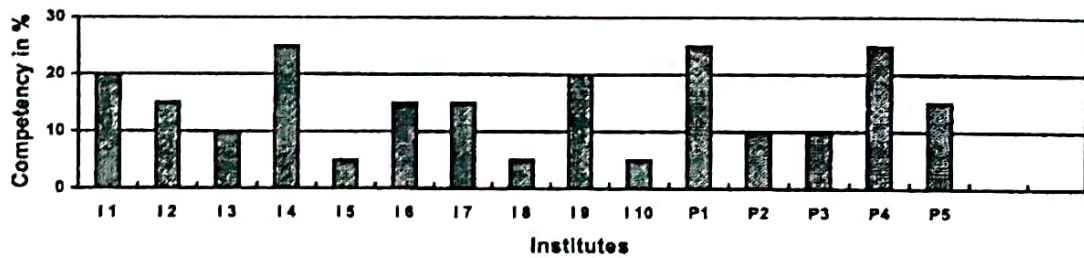
Fig. 7. PRESENCE OF 'IMITATION' COMPETENCY
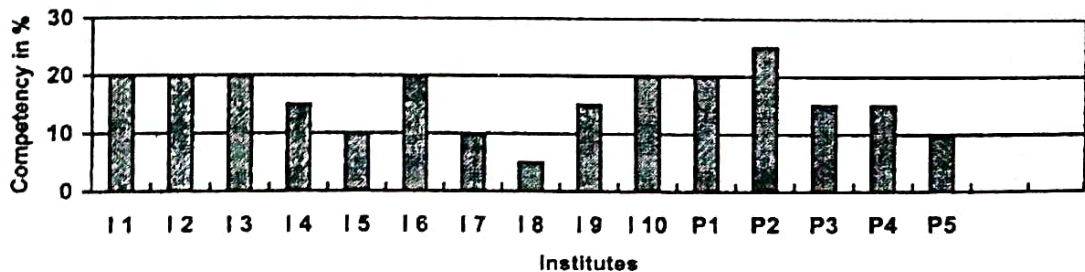
Fig. 8. PRESENCE OF ' MANIPULATION' COMPETENCY
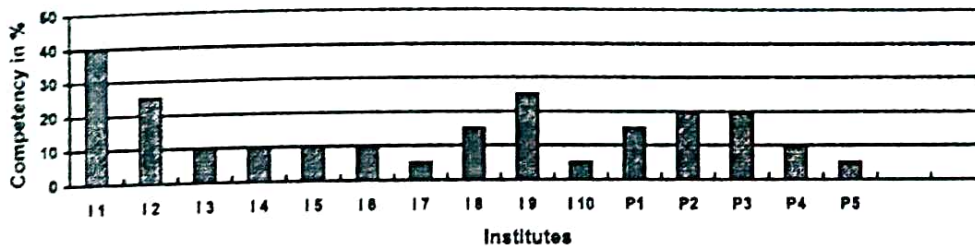
Fig. 9. PRESENCE OF 'PRECISION' COMPETENCY
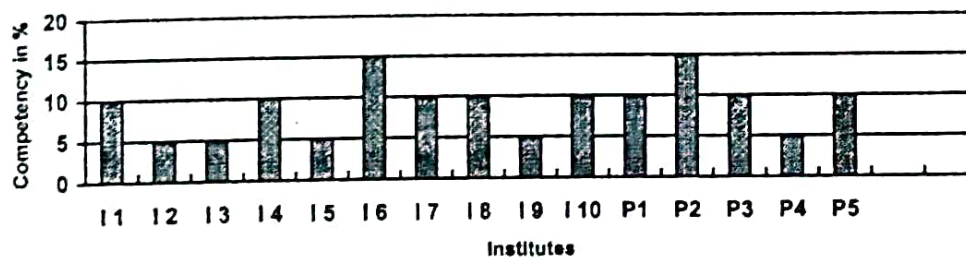
Fig. 10. PRESENCE OF 'ARTICULATION' COMPETENCY
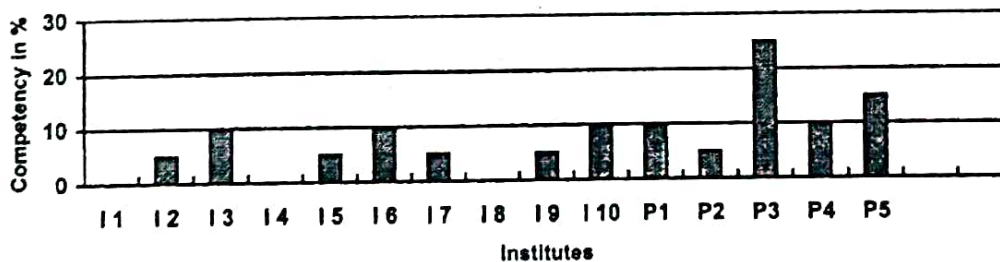
Fig. 11. PRESENCE OF 'NATURALISATION' COMPETENCY

S. No	Competency	Median	Standard Deviation
1	Knowledge	15	8.208590158
2	Comprehension	20	3.086066999
3	Application	20	23.71959206
4	Analysis	15	6.935073048
5	Synthesis	5	7.511895329
6	Evaluation	10	6.324555320
7	Imitation	5	7.187952884
8	Manipulation	15	5.411632769
9	Precision	15	9.813741581
10	Articulation	10	3.380617019
11	Naturalization	5	6.510065467

It is imperative to note that except for the 'comprehension' competency of cognitive domain and 'Articulation' competency of the psychomotor domain, all other competencies show significant deviation. Hence it may be concluded that no policy has been into consideration in framing the syllabus in incorporating any competency in the respective syllabus.

SUMMARY OF RESULTS

It is found from the analysis that it will be difficult to find out the average percentage,

as the variation is in a highly random fashion. However, it is inferred from this analysis that the presence of competency components of both the Cognitive as well as Psychomotor domains, that there might not be any policy in designing the syllabus for the inclusion of any educational objectives in these institutions.

The percentage of competencies of the lower cadre, viz., *Knowledge, Comprehension and Application* of the Cognitive domain is more felt rather than the presence of the higher order competencies of the same domain. No such marked difference is seen from the analysis of psychomotor domain.

Difference in the distribution of competencies is seen between Government run institutes along with well-organized Computer educational Institutes and the unorganized (commercialized) Institutes.

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Laboratory Development

ANURADHA DE

1.0 INTRODUCTION

The aim of developing a laboratory is to acquaint the students with the practical aspects, insight and understanding of the basic principles involved in the course curriculum of a specific discipline.

The laboratory is one learning situation among many others like, classroom (lecture / tutorial), home assignments, workshop, individual study projects, educational tours etc. The activities are to be so planned and the physical and human resources are to be so deployed that the learning outcome is optimized within the given time.

Therefore, activities for the laboratory work are to be so chosen that those be learnt best in least time in the laboratory situation only. This implies that many of the verification type experiments may be kept as demonstrations and if possible, demonstrations can be made in classroom. Learning of the use of equipment, instruments and procedures that need hands-on experience are therefore, ideal activities for the laboratory work.

The analysis of the curriculum structure of the Diploma / Engineering programme reveals that 50% to 60% of the curriculum is focused on laboratory work. Therefore, greater importance should be given for the proper development of updated / advanced laboratories. In case of updating an existing laboratory, the constraints are many but the

objectives may be less in number. In this situation, the existing equipment layout and organizational system have to be rearranged with minor additions / deletions to achieve additional objectives. In this respect, it requires the changing of habits of all people concerned. On the other hand, for setting a new laboratory, although the constraints are few, the magnitude of the task is very high. The important aspects in this respect are as follows:

➢ Planning, Designing and Development stage
➢ Laboratory Management & Maintenance stage
➢ Instruction stage
➢ Evaluation stage

Discussion on the above mentioned headings are made in the following sections giving major emphasis on the planning, designing and development of a new laboratory.

2.0 PLANNING, DESIGNING AND DEVELOPMENT STAGE

Laboratory activity refers to the work carried out by students either individually or in groups. It may also include workshops, drawings and discipline related project works. Therefore, the planning, designing development stage of laboratory is the most important aspect, which primarily includes the following activities:

- Listing of various experiments

- Selection of equipment

- Purchase procedure for procurement of equipment

- Laboratory arrangement

- Laboratory personnel

1. Listing of various experiments

The first step for 'Listing of various experiments' is the analysis of the curriculum to identify the required laboratory experiments. Maximum coverage of the topics taught through lectures in the classroom should be the main aim while selecting the experiments to be conducted in a particular course. In order to achieve the desired objectives, the design of the laboratory based activities may be classified as 'Structured Experiments', 'Simple Models' and Mini / Minor Projects'. From an educational point of view, laboratory experiments can broadly be categorized into the following groups:

(a) **Conventional type experiment:** Such experiments are teacher centered because all the information regarding the performance of the experiment is provided to students verbally or through laboratory instruction manuals.

(b) **Discovery type experiment:** These experiments can be designed to guide students to discover certain facts, principles, concepts, relationships etc.

(c) **Investigative type experiment:** In these experiments, the students are required to plan the experimental steps for collecting data and for drawing conclusion.

(d) **Problem solving type experiment:** In this type of experiments, once problem statement is given by the teacher, students are made to think, plan and generate solution by collecting data using requisite instruments / tools.

(e) **Project type experiment:** For such experiments, students choose any type of laboratory investigation / field exercise using available facilities in specific laboratory / workshop.

II. Selection of equipment

The equipment for a laboratory can be classified into two categories, like, 'Basic type' and 'Specific type'. Basic type equipment take care of the general requirements of the laboratory and the specific type equipment are to meet the specific requirements of the experiment. The important aspects for selection of equipment are as follows:

➤ For a new laboratory, basic type equipment are to be procured. For example, for physics laboratory - OHM meter, low voltage power supply, eliminator sets, barometer, common balance, stop watch etc. For a self-sufficient laboratory, gauging tools, hand tools etc. are the essential requirements.

➤ The selection of specific type equipment have to be made experiment-wise, model-wise and project-wise.

➤ The tabulation of the required equipment is to be done using columns representing Sl.No., Aim of Experiment (or Experiment No.), Name of Equipments, and quantity of equipment. Sometime for different experiment, some common equipment are required. Therefore, equipment are to be cross-referenced against each experiment / activity and then the optimization of the required number of equipment must have to be made.

➤ The selection of the number of the same equipment depends on the number of students working together. Additional number of equipment is required as back up and these are also required during the practical examination time.

➤ Suitable care must be taken while issuing the technical information for a particular machine / equipment.

➤ If utilization factor (as per AICTE norms) is very low in case of some costly equipment although essential as per curriculum objectives, either of the following strategies may be considered:

  (i) Collaboration with other external institute / organization who provides such facilities for training occasionally

  (ii) Lease the expensive facility of the institute to external users and thereby earning some revenue.

➤ Merits of selecting multipurpose and miniature sized equipment and simulators specially designed for educational purposes can be considered in terms of economy, ease of handling for beginners, improvement of utilization factor, learning efficiency and safety as against the commercial type meant for the field / industry.

III. Purchase of equipment

The first step for procurement of equipment is to decide on the specification of the equipment. Care must be taken in finalising proper specification of the equipment of the laboratory. Incomplete specification often leads to supply of equipment with unwanted features. For performing this process properly, the following important points are to be noted.

➤ To have information about different equipment available in our country / abroad through various literaturet / interactions with other institutions / internet browsing or through other ways

➤ To collect the information of different established vendors for different equipment

➤ To collect the information about the specification of equipment from the presentation / information given by different vendors before purchase (if possible) and finalization of specification of equipment have to be made.

➤ To follow the state government norm for purchase.

IV Laboratory arrangements

Careful examination of the minute detail is necessary, as they are often forgotten during the planning stage, and cannot be easily corrected later.

➤ Common facilities like
  - Display board
  - Washbasin
  - Refrigerator
  - Exhaust fans
  - Fire extinguishers, and emergency doors
  - Laboratory general safety measures (like, 'standard safety equipment', 'dresses', 'first aid box', etc.)
  - Complaint and suggestion box

➤ Laboratory specific facilities like
  - Sound proofing, dehumidification, supply of gas or water taps, soft flooring, air conditioning, dark room etc.
  - Laboratory specific health & safety measures

- Listing of various experiments
- Selection of equipment
- Purchase procedure for procurement of equipment
- Laboratory arrangement
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Important choice parameters for laboratory arrangements are as follows:

➢ Size of the laboratory: In this respect, AICTE norm can be followed. In all cases of initial planning of laboratory size, sufficient provision must be kept for future expansion of activities. In extreme cases where such space cannot be found, new annex might have to be organized.

➢ Sufficient working space must be provided in order to conduct an experiment. Maximum five students should get free space in performing an experiment.

➢ An area should be kept for the laboratory staff and faculty for their activities like, setting up of equipment for classroom demonstration, minor repair and maintenance of equipment, student project works etc.

➢ Space at the one corner of the laboratory may be utilized for servicing equipment for proper cleaning, dusting and oiling.

➢ Laboratory furniture: Proper laboratory tables, compact chairs / stacking stools, almirah, black / white board

➢ Placement of laboratory tables in proper locations depending on the nature and function of the equipment

➢ Walls should be kept free, so that some wall mounted equipment can be installed.

➢ Proper layout of Laboratory: Minimization of space and maximization of experiments using a particular experimental setup

➢ Proper electric connection, voltage stabilizer, switchboard and electrical extension boards. Number of switchboards for lights and fans should

be minimum and should be placed near the entrance only.

➢ Proper sitting arrangements for a group of students (at least fifteen) to take notes / instruction

➢ Separate sitting chamber for the Lab Assistants

➢ Sitting arrangement for the Lab-in-charge should be provided in the laboratory

➢ Suitable storage facilities must be created to store laboratory portable instruments, devices, raw materials, tools, spare forms, stationery and records systematically.

➢ Well-equipped laboratory / workshop should also have:

• Suitable models, charts

• Computers for

  » Maintenance of database

  » Power point presentation of instruction material

  » Multimedia kits / computer aided instruction (CAI) related to equipment etc.

For this purpose, covered cubicle is required.

V Laboratory Personnel

The key persons involved in providing benefits of learning to students are teacher in charge and the laboratory technicians. The number of technical staff required depends on the class and expertise in specialized technical areas. Beside the theoretical knowledge of the principles of the experiment to be conducted in a particular laboratory, the technician / lab assistant should have following qualities:

• Good knowledge about the care and use of the instruments

- Minor repair / trouble shooting capability

- Competencies in the management role that are supportive of learning process in the laboratory.

Therefore, the selection of technical staff should be made giving priority on the laboratory skill and attitude.

3.0 LABORATORY MANAGEMENT & MAINTENANCE STAGE

After setting the laboratory, the management and maintenance aspects would obviously play major role in the proper functioning of the laboratory. To obtain maximum benefits from the laboratory, in terms of learning by doing the experiments, it is essential that the key persons (i.e., the teacher in charge and the laboratory technicians) are able to manage and maintain the upkeep of the laboratory. For this purpose, it is necessary for them to get involved in laboratory management on daily / weekly basis. Teachers need to develop plans and procedures and see that they are systematically implemented and maintained. It must be realized that the proper and timely maintenance of any utility item is most essential if good quality service is to be obtained. The important aspects of management and maintenance of a laboratory are:

➤ Creating and promoting the conducive environment in the laboratory

➤ Availability of all necessary tools and instruments of the laboratory to students

➤ Maintenance of Log-book for weekly time-table

➤ Routine care / warm up of all equipment / tools and periodic running of equipment (at least once in a week)

➤ Maintenance plan for controlling tools and supplies beforehand

➤ Stock / stores ledger including stationery, reference books etc.

➤ Appropriate steps in Minor / Major repairing procedures, which include the following:

- Repairing service should be made following the proper procedure if the equipment is not under yearly maintenance contract

- Writing a repair requisition to the Head of the institution mentioning the approximate requisite budget for getting financial approval

- Checking the job of repairing to the level of satisfaction

- Record of maintenance work and certification to Accounts department for payment to the repair service provider

➤ Besides, students shall be guided and encouraged to use tools / instruments in a correct way and keep them back in respective places after cleaning (if necessary)

➤ Periodical modification / Improvement of instructional material, if required.

There are a number of duties involved in maintaining a laboratory. The teacher may do some of them, the technicians may do some activities and few may be carried out jointly. A well-managed laboratory may prove to be a source of satisfaction and pleasure for all involved in a committed and dedicated way.

4.0 INSTRUCTION STAGE

Laboratory based learning must provide adequate opportunities to integrate theory with practice and to promote industry / field like work environment inside the laboratory.

Pertaining to certain skills and attitudes, many of the instructional objectives, can be developed better in the laboratory than through classroom teaching. The nature of the learning process in a laboratory can be classified into three major situations, i.e., the 'stimulus' situation, the 'response' situation and the 'interactive' situation. The important points for these three learning situations are highlighted as follows:

In the 'stimulus' situation:

- Minimizing the listening, simplifying reading and maximizing observation
- Environment should be attractive to the students. The teachers arrange the environment; suggest ways of acting on it and device mechanisms to keep the student attentive.

In the 'response' situation.

- Response in psychomotor activities follows immediately after each observed or perceived stimulus
- To ensure proper response, the control should be situational to minimize undesirable influences or irrelevant cues.

In the 'interactive' situation.

- The relevant learning skill in the contrived situation has to be imparted in stages so that the student gradually becomes an independent worker.
- It is an established fact that the less direct help from the teachers at times helps the student learn best.

Essential components of an effective verbal instruction:

(a) Attention is drawn and curiosity is aroused by creating a conducive, cordial and friendly atmosphere

(b) With clarity of thought and expression, information is to be released in small doses

(c) The informal and cheerful communication style with effective eye contact with students is to be used

(d) Natural body movements with proper gestures is to be made

(e) The voice must be controlled with respect to the size of the audience

Laboratory Instruction

The normal practice during the activity implementation stage of a laboratory is to prepare instruction sheets for related experiments in addition to verbal instruction to the students. The components of laboratory instruction are as follows:

(a) Title of the experiment

(b) Aim of the experiment

(c) Performance objectives

(d) Theory (the minimum required to do the experiment)

(e) Necessary equipment / tools used (with specification and quantity)

(g) Specimen Used (as supplied)

(h) Outline of the Laboratory set up (diagrams, sketches or photographs, if any)

(i) Procedure (stepwise)

(j) Observations (tabular format preferably)

(k) Calculations

(l) Results (in the form or graphs, numerical values, statements)

(m) Precautions

(n) Discussion / conclusion

(o) Oral / short / objective questions

5.0 EVALUATION STAGE

Evaluation is a continuous process, it is apparent that laboratory performances must be assessed on the basis of the skills based on the following three domains:

➤ Cognitive Domain (i.e., learning outcomes using one's head)

➤ Psychomotor Domain (i.e., learning outcomes using one's body)

➤ Affective (i.e., learning outcomes exhibiting one's attitude, feelings, interests, etc.)

Specific features of evaluation criteria:

Some example on specific features for evaluation criteria related to skills based on the above three domains are stated as follows:

Skills related to Cognitive Domain:

Ability to

➤ State the definition / formula

➤ List materials / instruments used

➤ State sources of error and precautions needed

➤ Compare results with those of standard ones

➤ Draw conclusion

➤ Mention field of applications.

Skills related to Psychomotor Domain:

Ability to

➤ Record laboratory observations

➤ Draw sketches of experimental-set up

➤ Draw graphs

➤ Recognize malfunction by sound from a machine

➤ Assemble the machine perfectly

➤ Write smoothly and legibly

Skills related to Affective Domain:

(a) Punctuality

- Entry in the laboratory on time.
- Submission of laboratory report as per instruction and on time

(b) Attitude:

- Assuming responsibility for the instruments
- To return instruments / hand tools properly after performing laboratory work
- Self learning of how to prepare a report
- Attitude for joint venture in laboratory work
- Ability of doing work with care and safety
- Habit of neat dress.
- Ability of doing neat work.

(c) Interest:

Ability to

- Complete the work with tenacity & without wasting time
- Undertake worthwhile work even though it is difficult
- Work independently (except when help is absolutely necessary)
- Enquire matters related to experiments / tasks.

6.0 CONCLUSION

A well-managed and functional laboratory providing optimum learning outcomes within the minimum time is the objective of the laboratory development. Laboratory experiences for the students serve as a powerful tool in making the teaching and learning process more effective. More

participation of students in the laboratory activities would ensure development of confidence in them and the ultimate goal for development of the laboratory would be achieved.

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Enhancing Peace Education through Home Economics Programme in Nigeria

ABAZU HELEN UZO

ABSTRACT

This study focused on the perceptions of lecturers from various families in Nigeria on the enhancing of peace education through Home Economics programme. The study was in Anambra State of Nigeria. The paper reveals various ways in which peace education can be promoted through Home Economics.

INTRODUCTION

Peace education can be those areas and aspects of total education of the individual and the group that relates to the promoting of peace, harmony, love and discouragement of crises and problems, (James, 2003)

This refers to those aspects of education both formal and non-formal in and out of elimination of group hatred and stereotypes, prejudices which make people prefer violence to non-violence, separation to co-operation, discrimination to acceptance, destruction to construction and crises to peace.

Aims of home economics towards peace education

This helps people to identify and develop certain fundamental competencies that will be effective in personal and family living regardless of circumstances of the individual and the family. This is one of the aims and objectives of Home Economics (Martha and Babara, 1997). Peace education aims at developing reflective and critical individual thinking. In various fields, reflective and critical thinking are very important, in personal relationship, in vocational and professional relations. This is as part of the political involvement of adults and with regard to the influence of the mass media in modernizing the ideas of citizens of today.

Anyakoha and Coleman (1991) stated that family is the hub of the society. This shows that the quality of family units make the quality of the community. For this, Home Economics education believes in development of individuals and inter-personal relations which improves the quality of individual, the family, the society, nation and the world.

Home Economics included Food and Nutrition, Home Management, Clothing and Textiles, Child Development, Family Relationship. The content of Home Economics is a synthesis of the physical, biological and social sciences, the art and the humanities as they are applied to the improvement of the family living. (Olaitan and Agusiobo, 1981). Home Economics is the integral part of the school curriculum and as a subject supposed to be compulsory to all levels of education. It is a unique field primarily concerned with the improvement of family living and helping the individual live a useful and satisfying life. (James, 2003)

This study will focus on family relationship since Home Economics is to integrate peaceful co-existence within and outside home. Merek (1981) stated that peace is absence of crises or could be seen as negation of crises. The control and resolution of the crises in the family determine the amount of peace in the world because it is said that "Charity begins at Home". Eluwa (1991) agreed that a crises situation is when things ceases to go on as usual. This affects family goals, values and standards.

What is Crises?

Crises is any negative situation in which for a person, his resources and usual pattern of life are inadequate (Rice and Tinkin, 1975). Family crises disorganize and could be seen as interaction of a particular type of event, the behavioural nature of crises is sharp.

Each individual and family face some stress situations that disrupt family living. They are communication breakdown, minor disagreement, disputes, value clashes, arguments and quarrel Coleman (1988) stressed that unmet needs, money, power struggles, roles and responsibility expectations, sexual difficulties, jealously, violence, extra marital affairs and anger causes crises in the family and the society.

Family crises are: - competition, differences over methods of doing things, inconsistent application of roles, involving authority and responsibility, limited resources, financial dependence, poor relationship and poor communication. (Nickel *et al* 1985).

Peace education is seen as necessary instrument used to destroy or disform whatever form of crises that has erupted at home or community.

What is Peace Education?

James (2003) stressed that peace education is an education for oneness, respect, and regard, caring and for sharing. It is a social process through which peace is achieved. It also involves shaving of love, practicing of equality of rights for every member of the family and a community, it also involves learning of non-violent, crises resolutions, peace keeping and respect for others. This is a lesson every woman should perceive.

Family relationship is dynamic and static, it involves intimacies that other relationships do not have. These relations last long and they are husband-wife relationship, brother-sister relationship. These relationships lead to family understanding, and family common goals and values. Effective function of family evolves ways of resolving and managing crises for harmonious family living and these ensure sharing of work, joy, rest and play.

According to Rice (1991) there are many ways of resolving or managing crises, it is through dialogues, ignoring the situation, separation or withdrawal, intermediaries, displacement. Thomas (1990) stressed some guidelines that could help in resolving crises and they are: open communication, agreeing to disagree, specifying the behaviour to be changed and evaluating change using feedback.

There is need to educate young boys and girls on the crises management among the family and the need in using dialogue to settle issues within the family. This shows that peace education offers opportunity for acquisition of necessary skills, which are very important in the family living for management of crises. It is now very clear that peace education could be achieved through ´Home Economics

programme in Nigeria. Even in the whole world, peace education should be meant for every individual or citizen as no education is limited to any age. Likewise peace education does not limit to any age or institutions. Peace education cuts across all sections of the society and family, likewise Home Economics programmes. Peace education is needed by both youth and adults. The study is then designed to find out from women their perception of peace education, the need for crises management and the ideas needed for peaceful coexistence within the citizenry.

The curriculum planners and decision-makers and even the homemakers will find this study of vital importance as to guide their decision with regard to peace education for its incorporation into the school curriculum. In order to establish peaceful, coexistence within the society the Non-Government Organization (NGO) can incorporate peace education into their programmes. The study was made to access peace education, which could be promoted through Home Economics programmes in Nigeria.

Necessary peace education needed by women, youth and families:

➢ Promotion of family relationships

➢ Caring and sharing

➢ Accepting equality

➢ Avoidance of aggression

➢ Love for another

➢ Regard the worth of others

➢ Respect to fundamental human right and human dignity

➢ Inclusion of peace education in school curricula at various levels of education

➢ Ignoring factors that can easily lead to crises for the sake of peace

➢ Tolerance and humility in dealing with others.

These are full practices of peace education as regards to Home Economics.

Ability to promote peaceful living and crises management:

The skills for management of crises include:

➢ Family maintains peaceful environment.

➢ Family sets their goals and values, with objectives.

➢ Performing of assigned roles by family members.

➢ Extended family members interference be tolerated.

➢ Friends and other non-members involvement in family crises.

➢ Authority and obedience in the family is hierarchical.

➢ Allocation of family resources for caring.

➢ Rights and obligations have to be clarified.

➢ Negotiation and Dialogue.

➢ Issues are confronted as they occur.

All these skills are considered very important and will help the woman and families to manage crises as they arise.

The absence of crises may not or may ensure peace, it could be regarded as negative or neutral peace while a situation of love and caring can be described as positive Peace, (Maduewesi, 1977). Peace is a style of life, a mental attitude, a state of equilibrium. One can have peace without any physical comfort of life and another may not have peace despite all the luxuries of life around. Feeding of internal well being and good will toward others is a positive peace.

The relationship between family life and peace education shows that harmony is needed within and outside the school system. Crises can be managed through dialogue and negotiation for peaceful coexistence in the society. Hence all Home Economics programmes can include peace education in its curriculum.

Conclusion

It has been seen that Home Economics Educations promotes peace. It does not only deal with individual or family but society and nation. The programme educates and create peaceful relationship and environment and so promote nation building, it is therefore recommended that:

1. There should be peace education included in Home Economics programme and curriculum and other related courses.

2. Non-governmental organization and religious groups should make adult education compulsory for illiterate parent especially women to promote peaceful atmosphere.

3. Conferences, seminars, workshop should be organized in collaboration with Home Economics on crises management needed by Nigerian citizens to promote peace environment.

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Factors that influence the study of vocational subjects in Nigeria

AZUBUIKE and C. OZIOMA

ABSTRACT

The main aim of the work was to examine the factors that influence the attitude of Nigerian Students towards the study of Vocational subjects. This is as a result of students' apathy to study vocational subjects in Nigeria. The study highlighted the variables like interest, gender and socio-economic status as it influences the students choice of the vocational subjects. Based on these, recommendations for its improvement was proposed.

INTRODUCTION

A vocation is a feeling of having been called or born to a particular type of work. Vocational means to carry on a successful socially useful occupation (Nwaiwu, 1996). It is a training for useful employment in trade, industry, agriculture, business and home making. The emphasis of vocational subject is to prepare one for self reliance.

Vocational subjects are those designed to develop skills, abilities, understanding, attitude, work habit and appreciation encompassing knowledge and information needed by worker to enter and make progress in employment on a useful and productive basis. It contributes to the production of good citizens by developing these physical, social, civic, cultural and economic competencies.

The Nigeria National policy on Education (1998) stated the goals and / or objectives of vocational education as:

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

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

3. To give training and impart the necessary skill for craft-men, technicians and other skilled personnel who will be enterprising and self-reliant.

4. Enable our young men & women to have intelligent understanding of the increasing complexity of technology.

Despite the good intention of Nigeria federal and state government about vocational subjects, Nigerian students still pay little or no attention to vocational subjects. Students seem not to understand what it is all about and consequently, they develop some contempt and aversion for the subject. As a result of this, today's students attitude towards the study of vocational subjects remain unhealthy.

Vocational subjects ought to attract many students because of its laudable importance, but the reverse has been the case. The reason for this, probably is due to people's perception that it does not require specialized kind of training. They have the

feeling that even if one is at home the requisite skills needed to learn how to cook, farm etc can be acquired without formal training.

What are vocational subjects

Vocational subjects are those subjects that is required to equip the learner with the knowledge of skill and attitude necessary for the effective management of the self. It requires skills, wisdom, dedication, care diligence, unusual patience and very strong power of observation. Therefore, a student who lacks all these tends to develop a negative attitude towards the study of vocational subject. (Osuala, 1992).

A pilot study on vocation and sex (1986) reported that subject area with which vocational subjects are involved fall largely into Agriculture, Home economics, Catering, Arts, Carpentry etc. However, Agriculture, Carpentry and Catering remain unpopular choices because they do not attract much interest amongst the students. Okeke (1984), noted that our young students regard farming (Agriculture) as an unnecessary suffering and that they have determined not to be involved in it. He stated that they console themselves with one popular saying - "whether good or bad man must eat" and this contributes to the students negative attitude to the study of vocational subjects.

Vocational subjects make room for the systematic type of training given in order to develop skills, knowledge, attitude, abilities and behaviour, all leading to a specific occupation and to a worthy citizenship. It is a functional development of the head and hand (Nwaigbo, 1987).

Factors that Influence the study of vocational subjects

National policy on Education (1998) emphasized that the federal government of Nigeria gives vocational subjects a very prominent place in Nigerian schools, but this good intention is apparently frustrated by the negative attitude of students and teachers as well as the dearth of qualified personnel and lack of relevant equipment.

Thus, the factors that influence the attitude of Nigerian students towards the study of vocational subjects can be discussed under the following sub-headings:

1. The level of interest of the students towards the study of vocational subjects.
2. The qualification of the vocational subject teachers and instructors.
3. Parental socio-economic status influence on the student's choice of vocational subjects.
4. The gender role of the student's enrolment in the study of vocational subjects.
5. The guidance counsellor influence on the student's attitude towards the study of vocational subjects.

It is not surprising that students are not interested in vocational subjects. At the heart of our society and economic problem is a national attitude that implies that vocational subjects are designed for some body else's children and is meant primarily for the children of the poor. This attitude is shared by students. Hence, it makes them to lack interest in the study of vocational subjects. Nigeria has promoted the idea that the only good education is the education capped by for four years.

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The youths see the university as the only target after secondary school and they dissipate their energies in the break-neck scramble of course we know that the 6 - 3-3-4 system of education in Nigeria never convinces that every product of secondary school shall enter university. This is why core subjects like Agricultural science, Home economics, Arts or any other vocational subject should be included in the school curriculum. Another factor that influence the students interest in the study of vocational subjects are inadequate laboratories/workshop and material/equipment in teaching and learning of the subjects. This is because workshop/laboratory practice is identified as one of the most effective used method of teaching vocational subjects by teachers.

Consequently, to promote the study of vocational subject, a good qualified teacher is needed. That is why we say, "the greatest single factor in teaching and learning is the teacher". No technique, no method, no device, no gadget can guarantee success, by only an effective qualified teacher can adequately execute these. Hence, the greatest motivating device yet discovered is the highly motivated teacher. It is important to note that, it is not only the problem of lack of qualified teachers, there is also the shortage of vocational subject teachers which is a factor that affects the enrolment of students in the study of vocational subjects.

More so, social class plays a vital role in determining the attitude of student towards the study of vocational subject in Nigeria. Higher occupational parents would want their child to be doctors, engineers, lawyers etc. with out considering if they can actually read to achieve that. The influence of parents in the development of students interest in vocational subject cannot be over emphasized.

This is because the parents status is one of the motivational factors that influence the individual decision in choosing a career/subject choice. Mkpa (1986) noted that the factors that determine the students subject choice are home, socio-economic status of the family and the influence of the school and attitude. Some parents are biased and rigid regarding the occupational choice of their children.

Another factor that influence the inadequate enrolment of students in the study of vocational subjects is gender/sex of the students. Sex stero type has a lot of influence on the role assignment not only in Nigeria but also in most developing nations. Most females/males who are competent in vocational subjects are discouraged from the profession of their choices. Males pursue more prestigious vocation thus, denying the development of vocational subjects.

On the other hand the roles of guidance counsellor to the students attitude towards the study of a subject particularly vocational subjects should not be left behind.

Nwaigbo (1987) highlighted that the guidance counsellor in our schools are not left out in the laissez-faire attitude of students to vocational subjects. This is because it is the guidance counsellor who examines the talents, abilities and aptitude of the students and advises them on the vocational career best suited to his/her type of person. It is the counsellor who constantly encourages the students through out the vocational subject programme. "Guidance counsellors is next to the captain in the ship of vocational studies". Regularly, the reverse is the case with the Nigerian guidance counsellor. The students should be properly guided by counsellors to enable them know the usefulness of vocational subject for future purposes.

CONCLUSION

Since vocational subjects is the development of skills, knowledge, abilities and behaviour necessary for entry into or advancement in a specific occupation, students should be properly integrated into it to enable them acquire the basic knowledge of vocational subjects. The motion required now is in the direction of self-reliance and national development which, incidentally, are twins in the womb of vocational education. We will only mature the mother in order to receive her babies.

RECOMMENDATION

The question is "Do we surrender to these problems and allow the vocational subjects its untimely obituary? Far from it ! I therefore, offer the following recommendations.

1. Teachers, Students, Parents, School administrators and the entire public should have a change of attitude in favour of vocational subjects. It is not for the poor and down trodden. It is for people whose talent and abilities are in the area of manipulative skills leading to technological transformation of the Nigerian society.

2. Parents and relatives should stop discouraging students working with their hands in preference to other professions. A child forced into these careers against his natural talent will live to blame his superiors for their actions.

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Environmentalism in Technical Education Curriculum in India and Iran

AKRAMOLMOLOK LAHIJANIAN

INTRODUCTION

Environmentalism encompasses everything, living and non living objects. The ecosystem is a natural unit of living and non-living things that remains in a balanced state until man or some natural disasters disturb them. People should be aware of interaction and relationships in the ecosystem. The role of human responsibility is to maintain the relationship and protect the environment. These should be critically considered to maintain the quality of life.

THE PROBLEM

UNESCO (1976) explains that Environmentalism in Education is a way of implementation of goals of environmentalism. It is not a separate branch of science of study. It should be carried out according to the principles of life - long integral education.

Mishra (1993) states that the Environmentalism in Education appears to be a process that equips human beings with awareness, knowledge, skills, attitudes, and commitment to improve environment.

Education in general, and technical education in particular is a very important sector in environmentalism promotion. It is assumed that if environmentalism and related issues have properly been incorporated in the curriculum, then the students will be in a better position to internalize them with comprehension. Technical education makes itself fit for the purpose of which they are supposed to work. Thus, the technical education is to be shaped by the environmentalism based on sustainable development. Hence the study emerges as "Environmentalism in Technical Education Curriculum."

OBJECTIVES

The objectives of the study are

➤ To compare Technical Education Curriculum in Civil Engineering in both countries with respect to environmentalism.

➤ To identify the environmentalism components introduced in the civil engineering curricula and assess the contents critically to find out whether techniques and technologies suggested can be internalized and used by the students.

➤ To ascertain the present role of principals in implementation of the environmentalism related curriculum,

➤ To evaluate the participation of teachers in environmentalism in Education, and identify the problems faced by teachers in teaching environmentalism issues

> To explore the awareness and participation of students in Environmentalism Education, and suggest ways by which Environmentalism in Education can be improved.

METHODOLOGY

Development of tools and procedure used in this research study are based on literature review, interaction with Principals of Polytechnic, Heads of Departments, and experts in the field. Tools used for the study were questionnaires.

The samples identified for the study were Principals, HoDs/Faculty, and students of polytechnic from both countries.

Hypotheses related to Principals, HoDs/Faculty and students are presented. Methodology involving qualitative and quantitative techniques were used to achieve the objectives of the study.

FINDINGS

Finding related to content analysis of this study has resulted such as apart from environmentalism in engineering subjects, a few environmentalism components are included in other subjects viz. Applied Chemistry (of first year) in India and Chemistry (of second year) in Iran. In addition, in environmentalism curriculum in India water pollution and its related issues were emphasized more than air pollution but in Iran both water and air pollution were emphasized equally. Detailed discussion on energy generation found a place in the curriculum of Iran where as no methods of energy generation has been incorporated in the Curriculum of India. Detailed discussion on various techniques to treat industrial waste, sewage and water, found place in both countries, but no discussion on history and background of air pollution in India, whereas

in Iran detailed history and background of air pollution is included.

Findings related to responses of Principals emphasized on inputs on environmentalism content, separate periods for teaching environmentalism, faculty sent for training programmes, demonstration of experiments by the lecturers, teachers designing graded exercises on environmentalism, text books and work books brought out.

Findings related to responses of HoDs/Faculty emphasized on text books for environmentalism subjects and presence of laboratory for teaching environmentalism topics, teaching through field studies and training programmes attended on environmentalism education and management.

Findings related to responses of students emphasized on familiarity with pollution, sanitation, sustainable development, conservation and ecological balance availability of separate laboratory for environmentalism topics, and visit to industries, treatment plants.

CONCLUSION

The study has been conducted to visualize a comprehensive approach to incorporate environmentalism in the curricula of Civil Engineering programmes in India and Iran.

The technical education curricula were compared with respect to environmentalism components. The components of environmentalism included in the curriculum of civil Engineering in India and Iran were identified. The study also identified missing curricula components which can be exchanged to enrich the courses in both the countries.

The role of the Principals in the implementation of environmentalism related

curriculum have been ascertained. The study evaluated the participation of HoDs/Faculty and the problems faced by them in implementing the environmentalism related curriculum through classroom instruction. The study explored the awareness and participation of the students. As curriculum implementation is a team work involving principals, HoD, faculty and students, the study highlighted their role and responsibilities to give the shape to successful implementation of environmentalism in technical education. The study enabled the identification of recommendations to Principals, Technical Administrators, Faculty and HoD of India and Iran.

KEYWORDS

Curriculum, Environmentalism, Technical Education

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"Development and Validation of Computer Based Multimedia Learning Package on Electromagnetism"

P. SIVAKUMAR and D. BRAHADEESWARAN

Need for the Research Study

In the curriculum of Diploma programme in Electrical Engineering a Course on "Electrical Machines – " is included In the 3rd Semester. The curriculum of this course contains a very important topic namely "Electromagnetism". Students are required to study the concepts, principles, rules or laws in this topic which lays the foundation for other courses the students will be studying during the rest of the Diploma programme. The topic on Electromagnetism includes a number of concepts which are abstract in nature and hence difficult to learn. Multimedia Learning Packages on basic concepts in Electrical Engineering customised to suit the needs of polytechnic students are not readily available.

Hence, there is a felt need for the development and use of Computer Based Multimedia Learning Packages (CBMMLPs) for facilitating students learning of basic concepts related to Electromagnetism.

Objectives of the Study:

The five objectives of the study are:

1. To identify concepts related to the topic "Electromagnetism" for developing Computer Based Multimedia Learning Package (CBMMLP).

2. To develop a CBMMLP for the identified concepts.

3. To validate the CBMMLP.

4. To study the relative effectiveness of the CBMMLP in facilitating the learning of various concepts in Electromagnetism.

5. To study the difference between subgroups of the sample in learning the concepts through the CBMMLP based on the following:

   i. Entry qualification of the student.

   ii. Medium of instruction in the programme last studied by the student.

   iii. Type of Institution in which the students are studying.

Development of the CBMMLP

First the concepts related to 'Electromagnetism' which are perceived to be difficult for learning were identified by survey method. The CBMMLP was developed by following the nine steps listed below:

Step 1: Specifying the Objectives of the Package

Step 2: Content Development

Step 3: Instructional Design

Step 4: Presentation Design

Step 5: Organisation of Multimedia Resources

Step 6: Integration of the Resources using suitable authoring tool

Step 7: Alpha Testing of the Package

Step 8: Preparation of User Manual

Step 9: Pilot Study

Description of the CBMMLP:

The Package is titled as "Computer Based Multimedia Learning Package on Electromagnetism". The CBMMLP is presented through a CD-ROM. It is a self-learning package, which can be viewed independently by the student at his/her own place, pace and time. The CBMMLP consists of seven concepts. Under each concept specific objectives are listed. Each specific

The unique / special feature of the package is that it contains 25 experiment based demonstrations as video clippings.

Validation of the CBMMLP:

The CBMMLP was validated by using a one group, Pre-test–Treatment– Post-test design on a sample of 461 students studying in the third semester Diploma in Electrical Engineering Programme.

Effectiveness of CBMMLP:

The effectiveness of the CBMMLP was determined in terms of Gain Percentage for each of the seven concepts (Concept-wise) and also for each of the objectives (Objective-wise) under the concepts.

   i. The Gain Percentage for the seven concepts ranges from 83.51 to 91.79 with the Overall Gain Percentage being 86.58.

   ii. The Gain Percentage for the ten objectives ranges from 82.50 to 91.79 with a mean of 87.31.

The effect size for the seven concepts of the CBMMLP ranges from 2.69 to 6.37 with a mean of 3.82. As per guidelines provided by Cohen, J. (1992) these effect sizes are considered as large and educationally significant.

The effect size for the ten objectives of the CBMMLP ranges from 2.69 to 5.65 with a mean of 3.45. These effect sizes are considered large and educationally significant.

Three hypotheses were formulated and tested. The findings indicate that

1. the performance of students in learning the concepts through the CBMMLP with XII standard entry qualification is significantly higher (at .05 level) than that of students with X standard entry qualification

2. there is no significant difference (at .05 level) in learning the concepts through the CBMMLP between students who had studied their previous academic programme through English medium and those who had studied in Tamil medium and

3. the learning of the concepts through the CBMMLP by the students studying in Government Aided Polytechnics is significantly higher (at .05 level) than that of the students studying in (i) Government Polytechnics and (ii) Unaided Polytechnics.

Learners Satisfaction with the CBMMLP:

The students were requested to rate the various statements in the satisfaction survey questionnaire indicating the degree of satisfaction they derived from the CBMMLP. The satisfaction score of students range from 85.57 to 91.21 with a mean of 87.74. This indicates a high level of satisfaction of the students with the CBMMLP.

Based on the findings of the study, specific recommendations have been made to the Polytechnics, the State Directorates of Technical Education, NITTTRs, AICTE and MHRD of Government o India for improving the effectiveness of the teaching learning process through the use of CBMMLPs.

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