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ABSTRACT

A descriptive account of the organization and working of the Sharmik Vidyapeeth (Polyvalent Adult Education Centre) in Bombay, India, is presented. The purpose of the development of this center was to plan and develop integrated educational and training courses of various durations for workers and prospective workers. The centers were set up in urban areas for the following reasons: (1) Need for adult education was more conspicuous; (2) Material resources invested in the education of those employed or aspiring for employment will give quick results; (3) Motivation of the people to participate in these areas was considerably higher; and (4) Other elements and inputs necessary for the organization of education were considerably more favorable in urban areas. Objectives of the Centre include (1) enrichment of the lives of workers, (2) preparation of workers more adequately through general education for vocational and technical training, (3) improving their vocational skills and technical knowledge, and (4) developing in them the right perspective towards work. (CK)

AGENDA PAPER No. 1

ASIAN REGIONAL SEMINAR

ON

POLYVALENT ADULT EDUCATION CENTRES

POLYVALENT ADULT EDUCATION CENTRE: STRUCTURE & ORGANISATION

(AN INDIAN EXPERIENCE)

organised by

GOVERNMENT OF INDIA
MINISTRY OF EDUCATION AND SOCIAL WELFARE

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September 20 to 27, 1971
BOMBAY, INDIA

PREFACE

This paper has been prepared jointly by the Directorate of Adult Education,* Ministry of Education and Social Welfare, Government of India and the *Shramik Vidyapeeth* (Polyvalent Adult Education Centre) Bombay. It presents a descriptive account of the organisation and working of the *Shramik Vidyapeeth*, Bombay. The results achieved are encouraging and the experience strongly indicates the possibilities for further development. In a situation where schemes for adult education and training of working adults in urban and industrial areas do not exist, and where development process has to be so rapid that hardly there could be time to wait for having only trained persons in the jobs, where very limited opportunity for on the job training exists, and where State could hardly be expected to support in full the training of adults, it is essential to make the optimum use of existing facilities and resources and involve the educational, social and economic organizations in this task of educating adults which is of paramount importance and immediate concern.

Under the conditions mentioned above, the development of polyvalent adult education programme on the lines of the Polyvalent Adult Education Centre, appears to be a viable solution.

* The Directorate of Adult Education has been established from 1st of March, 1971. Previously it was the Department of Adult Education of the National Council of Educational Reseach and Training.

CONTENTS

INTRODUCTION

Adult education in one form or another has been in existence in India since times immemorial, but its recognition as an organised educational activity is fairly recent. So far, only sporadic and stray attempts have been made by the states, voluntary organisations and a few enlightened employers in developing programmes for education of adults. The bulk of the programme developed by the States consisted of (i) 'social education' with an emphasis on adult literacy, largely confined to rural areas, (ii) worker's education oriented to trade union education and leadership training of rank and file workers, and (iii) vocational education and technical training in a limited manner. In each of these programmes stress was on a single aspect of the need of an adult such as literacy, cultural and civic enlightenment, vocational training, or trade union orientation. However, on account of the polyvalent (multifaceted) nature of the educational needs of adults, it was realised that in the context of the situation obtaining in India particularly, what was needed was a polyvalent programme of adult education, which took into account the social, economic, and cultural needs and at the same time, was directed towards enabling the working adults not only to produce more by improving their knowledge and skills but also to live a richer and fuller life. UNESCO also emphasised the need for experimentation on the polyvalent approach to adult education. Recognising the varying educational and training needs of different categories of working adults and the lack of adequate facilities to meet these needs, UNESCO proposed to initiate a project adopting the polyvalent approach in an institutional form called Polyvalent Adult Education Centre.

Assistance by UNESCO in the form of experts and equipment was offered for the purpose of developing the project. The signing of an agreement between Government of India, Ministry of Education and UNESCO in October, 1964 marked the beginning of the project. The project envisaged establishment of a Central Adult Education Organisation to plan, and set up a net work of Polyvalent Adult Education Centres as well as provide guidance in their operation.

II
PURPOSE OF THE PROJECT

The purpose of the project was to plan and develop integrated educational and training courses of various durations for workers and prospective workers through the establishment of a net work of Polyvalent

Adult Education Centres and thus demonstrate to the country—state governments, trade unions, industrial and business enterprises and adult education organisations, how functionally valuable and to a fair measure, financial self-sustaining, programmes, of continuing adult education could be organised for a large number of workers having different levels of skill. educational background and experience of working in a variety of settings, so as to make them better workers by improving their job competence leading to their increased productive ability and at the same time enriching their personal lives.

III
ESTABLISHMENT OF THE PROJECT

The project was formally established in 1966 with the decision of the Ministry of Education, Government of India to establish the Central Adult Education Organisation as a unit of the Department of Adult Education in the National Council of Educational Research and Training to prepare the operational plans, develop and guide the programme of Polyvalent Centres in the country. It was proposed to set up Polyvalent Centres in the first instance in urban areas more precisely in industrial centres. The main assumptions for starting these centres in urban areas were :—

(i) need for adult education was more conspicuous and socially better recognised in urban and industrial centres,
(ii) material resources invested in the education of those employed or aspiring for employment in industry and business and especially workers will give quick results and will be able to show their effectiveness more clearly,
(iii) motivation of the people to participate in continuing education in urban and industrial areas was considerably higher, and
(iv) the whole series of other elements and inputs necessary for the organisation of education such as teaching staff, educational accommodation, equipment and experts were considerably more favourable in urban areas.

Accordingly, the first centre was set up at Bombay in March, 1967.

IV
THE WORKING OF THE SHRAMIK VIDYAPEETH (POLYVALENT ADULT EDUCATION CENTRE) BOMBAY

As mentioned above, the first Polyvalent Adult Education Centre with its corresponding Indian name *Shramik Vidyapeeth* was set up at Bombay. In selecting Bombay, for the establishment of the first centre, the main consideration, apart from the presence of large industrial population, was the existence of the Bombay City Social Education Committee, a non-governmental organisation having over 25 years of experience in

adult education in urban areas and which offered its complete support for organising the programme of Polyvalent Adult Education Centre.

a. **Organisation :**

The Bombay Polyvalent Centre works as an autonomous organisation with the financial assistance of the National Council of Educational Research and Training and technical guidance of the Central Adult Education Organisation Unit. The centre is managed by a *Shramik Vidyapeeth Samiti* (management body) consisting of 17 members representing the interests of workers, industrial undertakings, education, business enterprises, municipal corporation, adult education agencies etc. The *Shramik Vidyapeeth Samiti* was set up in accordance with the agreement signed by the Bombay City Social Education Committee with the National Council of Educational Research and Training for the purpose of establishment and management of the *Shramik Vidyapeeth* (Polyvalent Adult Education Centre). The *Samiti* plans and executes the specific programmes of the *Vidyapeeth* through sub-committees appointed for specific tasks.

b. **Scope :**

The *Vidyapeeth* aims to provide opportunities for polyvalent (many-sided) education and training to adults working in industries, transport, hotels, restaurants, business concerns, homes and various organisations in the city of Bombay.

c. **Objectives :**

The main objectives of the *Vidyapeeth* are :

(i) to enrich the lives of workers through knowledge and better understanding of their environment:
(ii) to prepare them more adequately through general education for vocational and technical training;
(iii) to improve the vocational skills and technical knowledge of workers for raising their efficiency and increasing productive ability; and
(iv) to develop the right perspective in them towards work.

d. **Staff :**

The *Vidyapeeth* had a provision of only a nucleus of full time staff for academic and administration purposes which consisted of a Principal and two lecturers: one for general education and other for the technical training and vocational education. For office and secretarial assistance, it had a modest establishment of necessary staff. In addition to this, the *Vidyapeeth* had a liberal provision in its budget to obtain the services of

qualified, experienced, and competent instructors, demonstrators, lecturers and consultants on part-time basis, according to the requirements of each programme organised. As it is true of all new educational institutions it took considerable amount of time in selection and appointment of the staff of the *Vidyapeeth*. In addition, there was also rapid turn over of staff.

Each staff member of the *Vidyapeeth* was expected to help in planning the programme, designing curriculum, selecting and training the part-time instructors, conducting and supervising the courses. Experience suggests that as the *Vidyapeeth* expands it would need additional staff to provide at least the supportive services such as library and documentation, audio-visual aids, teaching materials, and evaluation and follow-up.

e. Programme :

In accordance with the concept of flexibility in programme the *Vidyapeeth* did not have any pre-designed or pre-determined programme. Therefore, on the basis of specific needs of particular groups of working adults, programme consisted of educational and training courses of different durations. The statement given at Annexure I gives the nature and number of courses organised by the *Vidyapeeth* from April 1967 to August 1970. Since then, more programmes have been planned and organised and the *Vidyapeeth* has been active in meeting the needs of interested groups through developing more courses.

f. The Process of Programming :

The process of programming adopted by the *Vidyapeeth* is as follows :

(i) Ascertaining the nature of the programme

The programme and courses of the *Vidyapeeth* were based on specific educational needs and requirement of particular group of workers. To ascertain what programme the *Vidyapeeth* need to offer, a variety of methods which would indicate the need for education and training of the prospective participants were adopted. The following methods were tried by the *Vidyapeeth* in this regard :

Circular letters to industrial establishments, trade unions etc.

Circular letters giving the general statement about the purpose of the programme the *Shramik Vidyapeeth* may be able to offer were sent to number of industrial establishment, business concerns, trade unions etc. with a request to display the information on their notice boards and sponsor the participants in the course. Whenever, any specific response was made

by a particular agency, it was followed by a series of meetings and contacts with the concerned organizations. Courses such as course in weaving on plain looms, course in bench fitting and sheet metal work, course in supervisory skills, and course in industrial electricity, as given in Annexure I, were the result of such efforts.

Clue from advertisements in local newspapers

Study of advertisements appearing in the local daily newspapers also provided clue as to the need for preparing particular category of workers through training to meet the demand of industries and other organizations. Such advertisements usually indicated the requirement of knowledge and skills, the workers must possess in order to be recruited. The *Vidyapeeth* found this helpful in approaching the concerned organisations and explore the possibilities of developing appropriate need based courses in coeperation with them. The course in the use of 'verniers and micro-meters', 'course in workshop calculations', and 'course for domestic helpers' are the examples of programme thus developed.

Survey of educational needs

Certain programmes of the *Vidyapeeth* were based on the survey of educational needs of particular groups of adults. For example the survey conducted initially by the staff of the Bombay City Social Education Committee at the time of planning programme for the *Shramik Vidyapeeth,* revealed that a large number of adults participating in the programme of the Committee were also interested to have courses for learning functional english. As a result of this the *Vidyapeeth* organised a number of english language courses for different groups of workers at several different places. Another survey was conducted by the *Vidyapeeth* to determine the educational needs and interests of young adults attending night high schools in a particular locality. Adults attending night high schools expressed their interests in courses for skill in painting and drawing, course in office routine and course in english. In addition to this the *Vidyapeeth* also made use of the survey reports, of other organisations to study the characteristics and educational needs of particular group of workers.

Suggestions

Suggestions for programme made by the members of *Shramik Vidyapeeth Samiti*, technical education institutions, practising engineers, Mill Owners Associations, trade unions, part-time instructors and the outgoing participants of the *Vidyapeeth* formed an important basis for determining need for developing particular programmes. Such suggestions were usually made to the *Vidyapeeth* through letters by the organizations,

establishments and individuals. At times the *Vidyapeeth* staff also collected suggestions during the course of meeting and consultations they had with certain individuals and institutions. Courses such as course for maintenance fitters, course in heat treatment, course for electric motor winders, course in mechanical draftsmanship and course in workshop calculations were the ones developed on the suggestions received by the *Vidyapeeth.*

Request for Courses

Because of the change in technology and in the process of production, certain factories needed to have their workers trained in new technology and in the process of production being adopted by them. As for example the textile mills which switched over to the system of auto-loom weaving from plain looms made request to the *Vidyapeeth* to organize course for their auto-loom weavers. The *Vidyapeeth* received specific requests also for courses for workers in power meteralogy, diecasting, explosive farming etc. Proprietors of small scale industries sent request for courses in sales tax and income tax laws, cost control methods etc. to the *Vidyapeeth.* Similarly, the *Vidyapeeth,* organised a few courses like course for projector operation, and the course in marathi for the non-marathi speaking workers on the request made by a certain number of individuals. The experience of trying these methods suggests that no single method could be recommended for determining the need for programme but a combination of these methods would generally be helpful. However, the chances of response are relatively greater in cases when courses were developed on the specific requests or suggestions.

Programme thus identified, were at first discussed by the staff of the *Vidyapeeth* and then proposed in outline form for consideration and approval of the programme sub-committee of the *Shramik Vidyapeeth Samiti.* The programme which could be conveniently organised by the *Vidyapeeth,* for which support and cooperation from other agencies was found to be forthcoming, and for which instructors on part-time basis were readily available, were usually approved and organised. After the decision was taken regarding the number and nature of programme to be organised during a given period of time, the staff of the *Vidyapeeth,* negotiated with agencies which indicated their willingness to collaborate in the actual planning and organization of each programme.

(ii) Selection of Collaborating Agencies :

In keeping with the special concepts underlying the organization of Polyvalent Adult Education Centre, the courses of the *Vidyapeeth* were organised at places convenient to the participants. This in practice meant organization of courses at several places with the support and cooperation of different agencies in the city of Bombay. It was therefore necessary

for the *Vidyapeeth* to identify appropriate agency which was not only willing to cooperate but also helped in facilitating the organization of a particular course. While selecting collaborating agency for each course, the *Vidyapeeth* took into account not only the availability of rent free class room accommodation but also the offer of such other help as enrolment of the participants in the course, facilities for use of tools and machines for teaching and learning purposes, transportation facilities for the staff and part-time instructors, and possibility of financial contribution to meet the expenditure to some extent. In addition, the collaborating agency was also expected to provide help in designing curriculum for the course organised by the *Vidyapeeth*. Different approaches were adopted by the *Vidyapeeth* in selecting the collaborating agencies. In case of courses developed on the specific requests of certain organization or establishment, the requesting organization usually was expected to be the collaborating agency also. For programme developed on the basis of suggestions or in pursuance of survey of educational needs, or was based on the requests of certain individuals, then the *Vidyapeeth* often explored the possibility of getting the necessary facilities and support from one or several agencies in the city. The courses such as bench fitting and sheet metalwork, boiler attending, auto-loom weaving, and course for supervisors were organised at the premises of certain industrial establishments which expressed willingness to collaborate. While the courses sponsored by *Vidyapeeth* itself such as, english language courses, course for projector operations, course for domestic helpers, and mechanical draftsmanship courses, were held either at its own premises or at places made available for use by the trade unions, schools, libraries, welfare centres and other voluntary organizations.

It has been the experience of the *Vidyapeeth* that working through collaborating agency not only cuts the cost involved in organising the programme considerably, but was also helpful in reaching the groups of prospective participants, and involving the community agencies in a meaningful way to support the programme. The process of involvement permitted *Vidyapeeth* to utilize the unused resources which were found to be existing within the community, with the enterprises, trade unions, and other organizations. However, it has also beeen the experience that all agencies do not easily agree to collaborate with the *Vidyapeeth* untill they are convinced of the functional value of the programme being organised. Many a times it was found that the management of certain enterprises, although appreciated the idea of a particular programme, tended to be hesitent in collaborating with the *Vidyapeeth*. Some of the several reasons as enumerated particularly by the management of enterprises were: (i) the workers sponsored by them in the course might ask for immediate promotions or increase in wages as soon as they completed the course, either of which would be difficult for the management to ensure, (ii) trade

unions might exert pressure on the management for sponsoring particular workers only in the course, or for giving immediate promotions to those who completed the course, which would mean an unnecessary trouble with the trade unions, and (iii) after completing the course there was no guarantee that the worker would not seek job elsewhere and leave the enterprise which made some investment for his training. The additional factors which posed problems for the *Vidyapeeth* in its effort to get the sustained cooperation of enterprises and trade unions were the general tension between the employers and trade unions, general recession in industry, and at times the insistence of trade unions which though agreeable to collaborate, insisted on selecting workers of their own choice even if they were not adequately equipped to take the advantage of the course which was being organised. From the initial experiences of working with agencies it was clear that selection of appropriate agency should be done carefully and much ahead of time, as it generally takes considerable time and effort to persuade the agencies to appreciate and accept the purpose of the course offered.

(iii) Identification of Educational and Training Needs of Participants :

Each programme of the *Vidyapeeth* was to be based on the educational needs and training requirements of those who participated in it. *Vidyapeeth*, therefore made efforts to determine the requirements of the prospective participants, once the programme was broadly ascertained and the collaborating agency was decided upon. In the process of determining the educational needs of training requirements, information was collected by the staff of the *Vidyapeeth* about the prospective participants with regard to nature of job done or expected to be done, the task involved in performance of their role, the level of output and efficiency at which they were expected to do their job, nature of the previous experience, educational background, age, language known, timings which would suit them most, etc. A statement giving job description of the participants was obtained from the managers of the enterprises specially for courses developed on the request and suggestions made by them. Usually a few meetings and discussions were also held with the manager including the immediate supervisors for collecting relevant information about the workers who were sponsored by their enterprises. When the courses were to be planned by the *Vidyapeeth* on the basis of suggestions received from individuals or agencies other than those of the industrial enterprises, the staff of the *Vidyapeeth* approached, directly or through agency which agreed to collaborate, the prospective participants and tried to gather relevant information. Generally the information in such cases was collected through group meetings with prospective participants. Examples of such *Vidyapeeth* sponsored courses where group meetings were held with the participants were; course for domestic helpers, course in languages, and the courses for

projector operation. As and when needed the staff of the *Vidyapeeth* made also direct observation of the task performed by the prospective participants and tried to gather their specific requirements for learning. Experience however suggested that it was helpful and relatively easier too, to approach the prospective participants through an organisation, such as industrial enterprise, business concern, trade union, night school or adult education agency which has direct contact with prospective participants. In general the staff of the *Vidyapeeth* found it difficult to locate and approach the prospective participants individually for collection of information about their educational needs and interests.

(iv) Designing Curriculum of the Courses:

The curriculum for each course was developed by the *Vidyapeeth* taking into account the information collected regarding the educational and training requirements of the participants. As the staff of the *Vidyapeeth* was not expected to possess competence for developing curriculum of every type of course, the actual designing of curriculum was done by separate 'Curriculum Group' which was set up by the *Vidyapeeth* for each course. Such group consisted of one or more subject matter specialists, representative of the enterprise (who in most cases was the immediate supervisor of the prospective participants) or a representative of the collaborating agency, the prospective instructors of the course as and when available, and a member of the staff of the *Vidyapeeth* who acted as co-ordinator. The task of each 'Curriculum Group' was to state the general purpose and objectives of the course, give the contents of the course keeping in view the objectives to be achieved, specify the duration, number of class sessions, and methods of teaching each content unit such as, lecture, symposium, demonstration, and film. The content of the curriculum was so designed that it included general education subject to a logical extent possible, either to supplement technical requirements or to add to the knowledge and information of the environment in which the participants worked and lived. Description of a few courses organised by the *Vidyapeeth* are given as illustration in *Annexure III*.

The curriculum prepared by the 'Curriculum Group' was treated as tentative. It was then discussed with the participants and the instructors who taught in the course and modified accordingly.

In developing curriculum, an important consideration was the duration and content of the course, as these needed the acceptance both of the participants as well as those who sponsored them. It was seen in some cases that the management of the enterprises sponsoring the participant in the course insisted on reduction of the duration without reducing also the course content. In one course the enterprise desired that the content be restricted to the knowledge and skill required to perform a particular job and did not favour that the topics of general interest to the participant should also have some

place in the curriculum. Where as the participants saw value of an integted course. In planning the curriculum, therefore, in such cases the *Vidyapeeth* had to work out a compromise between the needs of employers and needs of workers participating in the course.

Another difficulty was related to the development of integrated courses. The concept of integrating general education in the programme of occupational or vocational nature was a new experiment in itself and no previous experience of this type of approach to programming was available to *Vidyapeeth.* In addition to it the staff of the *Vidyapeeth* also being new to this kind of work it was a complex task in the beginning to design curriculum based on the principle of integrating knowledge, skills and values relating to different aspects of the life of the participants in a meaningful manner. It was therefore natural that the new staff of the *Vidyapeeth* required, orientation and time to have exprience to develop programme based on this approach. There was, however a considerable improvement in courses planned after the initial experience of first year.

(v) Determining the Timings of Conducting the Courses:

As a matter of policy efforts were made to conduct the courses during the timings found convenient by the participants. This imposed the necessity of taking into account several factors such as working hours of the participants and the organizations in which they worked, convenient location of the class, facilities of transport, and the permission of the collaborating agency. For courses organised in collaboration with a particular enterprise, timings could be determined only with the approval of the management of the enterprise. It was found that the management frequently favoured timing for holding the classes outside the working hours of their enterprises so that the absence from work does not affect the production. However, there were, some enterprises, which allowed about half an hour early release to the workers sponsored to participate in the *Vidyapeeth,* courses. In one instance, viz., in a course for 'foremen and supervisors, management also allowed their workers to attend the course entirely during the working hours of the enterprise. On the whole, half an hour early release was considered to be a good strategy as this called for sacrifice of some time from the participating workers as well. Timings for courses conducted by the *Vidyapeeth* itself at places other than the enterprises, had to be outside the working hours as that was the only way most participants could find convenient time to attend. Even in such cases change in shift of working hours of the participant was a problem affecting his regular attendance. This was resolved when the employer of the concerned participant was persuaded to permit him to continue working in the same shift as long as the course lasted. The attitude of employers, even in respect of workers, in the course not sponsored by them was found to be favourable in most instances.

(vi) Enrolment :

Enrolling participants in a particular course posed a problem in the beginning as the applicants were few mainly because the courses offered were less known. However, this problem was resolved subsequently with the cooperation of enterprises, industrial associations, trade unions, and labour welfare centres which gave publicity to the *Vidyapeeth* courses through displaying the information regarding the courses on their notice boards and at times publishing in their respective news letters, and periodicals. Besides, they also sponsored candidates in courses, specially in those organised in collaboration with them. *Vidyapeeth* also put up its Bulletin Boards at the places where classes were held and displayed the information regarding new courses proposed to be started. For enrolment, participants were required to register themselves by filling registration forms, directly or through the organisation with which they were connected. Selection of participants was then done by a 'Selection Committee' consisting of the staff of the *Vidyapeeth,* representative of collaborating agency, technical specialists and instructors of the course. The policy of the *Vidyapeeth* was not to have more than 30 participants enrolled in each course so that adequate teaching -learning interaction could take place between the instructor and the participants.

(vii) Selection of Part-Time Instructors :

Keeping in view the topics to be taught in each course, instructors were appointed on part-time basis. Selection of instructors was based on personal approach of the staff of *Shramik Vidyapeeth.* Specialised institutions, enterprises, and individuals known to the staff were requested to provide the names of persons who could teach on part-time basis, topics of a given course. In making the selection of instructors, besides the requisite qualifications, practical experience and the ability to teach in the local language were also taken into consideration. Finding competent persons who could teach in the language understood by the participants was by no means an easy task. This was one of the major limitations in organising courses effectively. To facilitate the effective teaching, the staff of the *Vidyapeeth* introduced team teaching, use of audio-visual aids, and distribution of notes in local languages to the participants. In selecting part-time instructors, it was possible for the *Vidyapeeth* to select instructors from the technical staff of the enterprise where the course was held as well as from outside institutions. The management of some enterprises however, desired that the instructors be from outside for the reason that outside instructors would have a better psychological effect on participants. However, no difference was noticed by the staff of the *Vidyapeeth* with regard to the advantage of one over the other. An instructor with experience of similar work and knowledge of local language with some orientation was generally found to be a better teacher.

(viii) Training of Part-Time Instructors :

As the instructors for teaching in the courses were part-time and as they did not have experience of teaching such courses on part time all instructors needed some kind of orientation or briefing so that they could be acquainted with the purpose of the *Vidyapeeth*, objectives of course being taught, contents of the syllabus, methods of teachings, characterstics of the participants etc. As it was difficult to organise such orientation to a group of instructors, the staff of *Vidyapeeth* arranged individual meetings at the place and time convenient to the part-time instructor at his residence or place of work. Some informative material which included an introductory note on *Shramik Vidyapeeth*, copy of the syllabus, summary of the background of the participants, time schedule of the course, suggested method of teaching, and use of audio-visual aids was also given to the part time teacher during such meetings.

(ix) Supervision o' the Courses :

Supervision of the courses was the responsibility of the *Vidyapeeth* staff. The process of supervision was to see that a particular course was conducted according to the schedule, the instructors were available to teach on dates and time schedules, participants' attendance record was maintained, necessary teaching and learning materials were available to the class in time, and the class room environment was adequate. For this purpose member of the staff incharge of a particular course frequently visited the classes in session and met the instructors as well as the representatives of collaborating agency. It was observed that for courses planned and organised in collaboration with the enterprises, it was possible for the enterprises themselves to share to some extent the responsibility of supervison with the *Vidyapeeth* staff. This, not only eased the work load of the individual member of the staff of the *Vidyapeeth* but was also found useful in ensuring real and effective cooperation from the agency concerned.

(x) Methods and Materials :

The teaching and learning methods adopted by the *Vidyapeeth* varied according to the nature and content of each course. Lectures, discussions, demonstrations, practical exercises, films and visits to other institutions, workshops, factories etc. were frequently used to promote learning. There was no regidity about the use of any of these methods and the instructors were encouraged to use, to the extent possible, a combination of methods to promote the participants' learning. Since learning materials for the courses offered by *Vidyapeeth* were not available such materials had to be specially prepared, or those used in similar courses had to be borrowed from other agencies. For example relevant films were made available to the *Vidyapeeth* for use in the courses by the Department of Audio-Visual

Education of the Government of Maharashtra, U.S. Information Services, Central Board of workers' Education, technical institutions, and certain enterprises. Similarly, certain factories and technical institutions which were approached by the *Vidyapeeth* permitted their machines, tools and models for the purpose of practical demonstrations. The courses being 'tailor made' no text book as such was considered suitable. The *Vidyapeeth* therefore, encouraged the part-time instructors to provide mimeographed notes, sketches, diagrams, blue prints and illustrations in the regional languages to the participants. On the recommendation of instructors, relevant excerpts from certain books and periodicals were also made available to the participants. Such materials were intended to serve as a basis for purposeful discussions and useful reference material for the participants. Each participant was also provided during inaugural session of the course with a folder containing a copy of the curriculum, time-table, list of participants and instructors, and an informative note on the *Shramik Vidyapeeth*. The folder was also intended to enable the participants to keep the record of class notes, practical exercises, demonstrations, field visits as well as other literature provided during the course by the instructors. The folder remained with the participant permanently and it was found to serve as a good source of reference for him later on also.

The participants appreciated having such a folder and expressed their willingness to pay for it.

The *Vidyapeeth* felt that the work of producing need based teaching materials being a special task, it would be necessary to have the services of additional full time staff.

(xi) Evaluation :

Evaluation was intended to be an on going process in each course of the *Vidyapeeth*. During the first year, however, no systematic procedure for evaluation of the courses could be laid down. Subsequently, as experience was gained, it was considered important to include evaluation procedure in the curriculum itself for the guidance of the instructors, participants as well as for those concerned with the organisation of the courses. The evaluation procedures generally consisted of a pre-test and a terminal test. The pre-test was administered in the beginning of the course. The results of the pre-test revealed the degree or the level of knowledge, information and skills, possessed by the participants on the basis of which what was to be taught in the course to meet the objectives was determined. Such tests also enabled the organisers and teachers to choose appropriate methods of teaching and give due weightage in terms of time, which needed to be given for teaching of each content unit of the course. Results thus obtained from the pre-test were fed back to improve the organisation of the course. A terminal test was administered to find out how much the participants in the course were able to learn. In addition to it, with a view to making

general assesment of the value of each course, a discussion with the participants was generally held in the concluding session. Participants were also asked to give their opinions, impressions and suggestions in a prescribed proforma. Views of the instructors who taught the course and the representative of the collaborating agencies were also elicited in respect of each course in order to get their reaction towards the course.

In general, there was a great appreciation of the courses particularly those which helped the participants in increasing their occupational knowledge and skills, courses which enabled them to make vertical or horizontal changes in the job position possible, courses which helped them to improve their qualifications and thus enabled them to seek better jobs and earn better wages. Generally, the participants, as well as their sponsoring units, favoured the integration of the elements of general education with vocational courses as it enabled those who did not have necessary knowledge to take up the skilled training and added to the knowledge and information which helped the participants to promote their own understanding of the environment in which they worked and lived. The appreciation of some of these courses was also reflected in the requests for repeating the courses or developing new ones on similar lines for different categories of workers. Such requests were made to *shramik vidyapeeth* by the collaborating agencies, enterprises, business organisations, trade unions, employers, and individual workers themselves.

The experience of the *Vidyapeeth* suggested that the less qualified workers were interested in having courses which helped them to qualify for a recognised examination. Since the *Vidyapeeth* courses were "tailor-made" to suit the job requirements, such courses by their very nature were not suitable for such purposes. *Vidyapeeth* therefore, reviewed its programme and had been considering the question of offering courses which will enable workers to take a recognised examination and improve their qualifications for promotion or better jobs and better wages. As requested by the participants as well those who sponsored them, the *Vidyapeeth* has been issuing a certificate of attendance to all the participants attending particular courses.

g. **Financing :**

The primary source of finance for the *Vidyapeeth* has been the grant-in-aid made available by the National Council of Educational Research and Training to meet the cost of salary of full time staff, office administration, transport, incidental expenditure, and honorarium to be paid to the part-time staff whose services were obtained according to the requirements in each programme. Unesco provided some equipment, audio visual aids, and transport required for use in the programme. As the programme of the *Vidyapeeth* progressed, it was possible to involve the collaborating agencies in sharing part of the cost of organising the course. They provided

rent free use of class rooms, use of equipment and tools, workshops, transport facilities and in some cases cash contribution. From March 1967 to August 1970, the *Vidyapeeth* received Rs. 2,30, 683 as grant-in-aid from the National Council of Educational Research and Training. In addition to this, the *Vidyapeeth* received contribution in cash and kind of the approximate value of Rs. 39,425 from different agencies which cooperated in organising the courses. The statement given at *Annexure II* indicates the support *Vidyapeeth* received from different agencies in organising various courses and programmes. This being a new experiment, initially, it was decided not to charge any fee from the participants or those who sponsored them. However, it was encouraging to note that in certain courses the participants themselves expressed their willingness to pay towards cost involved in organising the course. Similarly, enterprises and trade unions which made requests either to repeat a particular course or develope new ones, were also willing to meet the cost involved in organising the course. Thus, as the enterprises, trade unions and the individual participants began to see the functional value of courses, they offered material support also to the *Vidyapeeth*. This experience indicates that the *Vidyapeeth* has potentialities to extend the scope of such support and thus develop to some extent into a financially self sustaining institution of adult education.

V

GENERAL OBSERVATIONS AND CONCLUSIONS

The experience on the working of this experimental project, though only of a few years, clearly proves the soundness of the idea behind the polyvalent approach that an integrated adult education programme would not only make the adult a better individual but also increase his productive capacity. There is sufficient evidence to confirm the assumption that general education by itself or technical education by itself would not meet the need of the industrial worker but only an integrated course of both would fulfil the objective. There is also evidence that such integration is not only possible but is effective in several ways, particularly in creating motivation and sustaining the interest of the worker participant. Based on the experience of the Bombay Polyvalent Centre, the following conclusions can be drawn :

1. The learning needs of adults in urban and industrial areas are polyvalent in nature and hence there is need for polyvalent adult education to meet such needs. Pre-determined and pre-designed programme or course with stress on a single aspect such as literacy, vocational training, recreation, or civic education, would hardly meet the need and therefore will generate little or no motivation in the adult participants for learning.
2. Programme planning has to be based on the needs and problems related to the participant's work and life.
3. The biggest advantage is in integrating vocational instructions

with general education. The integration of general education with vocational training not only facilitates more meaningful participation in vocational training leading to increased production but also increases the usefulness of general education to the individuals.

4. For working adults learning is a voluntary and optional activity. To motivate and sustain their interest in learning the competency of the instructors and the methods of instruction need to be of a high order.
5. Organisation of specific or 'tailor made' course is appreciated by the management and supervisors of the enterprises and hence the possibility of involving them and obtaining more support for programme of the centre is enhanced.
6. The programme being part-time, it was possible to get the facilities and accommodation for use from the collaborating agencies and other organisations, thus reducing the cost of the programme. In other words, the Centre need not have huge outlay on building and equipment before it is able to run its programme. Besides cutting the cost of accommodation and its maintenance, this arrangement contributes to the success of the programme as the classes are held at places convenient to participants.
7. Another significant result of the experiment is that it is better to have funds for securing the services of well qualified part-time instructors than appointing a few full-time permanent instructors who would teach different subjects.
8. Although initially sceptical of the value of the courses organised by the Centre, the management of the enterprises and other agencies who collaborated in the programme and those who sponsored their workers in the courses expressed their thorough approval of the programme and its effect on the workers. They referred to the following specific results related to their workers who participated in the course of the centre:

"The workers make fewer errors because they can now understand the instruction and work, hence the need for supervision is also less".

"The workers are more practical and careful in their work".

"The workers have a better attitude towards their work".

"The course has helped in improving the work skill and aptitude of workers. We would like to have the course repeated and be willing to share the expenditure involved".

"We are noticing that the producion errors, accidents and to some extent absenteeism have decreased and many other workers from our factory would like to enroll in the new course".

"We would like you to repeat the courses for boiler attendants, as many of the textile mills would like to take advantage of your courses and willing to reimburse the cost involved to some extent".

"Workers have shown definite improvement. Management is considering to give promotion to some of them",

ANNEXURES

ANNEXURE—I

SHRAMIK VIDYAPEETH, BOMBAY

A SUMMARY STATEMENT OF THE COURSES CONDUCTED BY SHRAMIK VIDYAPEETH FROM APRIL, 1967 TO AUGUST, 1970

S. No.	*Title, No. of Courses and Medium of Instruction*	*Noture and No. of Participants in each Course*	*Approximate duration*	*Instructional Hours*	*Place where the Course was conducted*
(1)	(2)	(3)	(4)	(5)	(6)
1.	Home Science Courses —Two—Marathi	25 to 35 women of lower income group	4 months	50 hours	At a Community Centre
2.	Art and Culture Course—One—Marathi	39 men and Women	2 months	25 hours	At a Community Centre
3.	Language Courses in Functional English—fifteen	20 to 30 workers, from Textile Mills, Household women	3½ months	25 to 40 hours	At Community Centres, Welfare Centres, School Buildings, Factory Premises and Residential Houses
4.	Secretarial Course for Office Staff—one—English	21 Secretarial workers	6 months		At a Community Centre
5.	Trade Training Course in Weaving—one—Marathi	11 unpaid workers	4 months	90 hours	At a Textile Mill
6.	Training Course in Benchfitting and Sheet Metal Work—one—Hindi	23 Fitters of difierent categories	4 months	100 hours	At a Steel Works Enterprise
7.	Training Course in Mechanical Draftsmanship—two—Marathi	25 workers working in different Textile Mills and Engineering Centres	9 months	300 hours	At a Workers Union Building
8.	Training Course in Home and Family Living—Two—Marathi	25 women domestic helpers	3 months	36 hours	At a Girls High School
9.	Film Projector Operation Training Course—Two—Marathi	25 workers	4 months	100 to 120 hours	At a Social Education Centre
10.	Course in Industrial Electricity—One—Marathi	23 Electricians	5 months	200 hours	At a Factory Premises
11.	Course in Weaving on Autolooms—three—Hindi	12 to 17 Autoloom weavers	3 months	100 hours	At a Textile Mill
12.	Course in Supervisory Skills—two—English	19 to 40 supervisors and foremen	3 months	50 to 55 hours	At an Automobile Factory
13.	Language Course in Functional Marathi—One — Marathi and Hindi	15 non-Marathi speaking industrial workers	4½ months	120 hours	At a Library
14.	Course in Boiler Attending—Two—Hindi and Marathi	19 to 22 Boiler Attendants and Foremen	4½ months	100 hours	At a Textile Mill
15.	Courses in Workshop Calculation—Two—Marathi	19 to 20 workers	5 months	100 hours	At a Community Centre
16.	Course in Use of Verniers and Micrometers —one—Marathi	11 workers working in Engineering concerns	2½ months	40 hours	At an Engineering Factory

ANNEXURE—II

SHRAMIK VIDYAPEETH, BOMBAY

A STATEMENT ON SUPPORT (WITH ESTIMATED VALUE) PROVIDED BY COLLABORATING AGENCIES

(THE ESTIMATED AMOUNT SHOWN IS FOR THE ENTIRE COURSE)

S. No.	*Title of the course*	*Collaborating agency*	*Description of the facilities provided by the collaborating agency*	*Item for which cash amount is estimated*	*Approx. estimate in terms of rupees*
1.	2.	3.	4.	5.	6.
1.	13 Language Coruses in English	Bombay City Social Education Committee	Rent free class room	Rent (for 13 classes)	5,000/-
2.	One Language Course in English	A Chemical and Drug Enterprise	Rent free furnished class room	Rent	600/-
3.	Secretarial Course for Office Staff	Bombay City Social Education Committee	Rent free furnished class room	Rent	500/-
4.	Course in Weaving on Plain Looms	A Textile Mill	a) Rent free furnished class room b) Machinery and equipment kept at disposal for practicals	Rent Rent of equipment & cost of material	500/- 1,000/-
5.	Course in Bench Fitting and Sheet Metal Work	A Steel Works Co.	a) Well furnished class room b) Early release to participatns by half an hour for enabling them to attend the course	Rent	1,000/-
			c) Tea and refreshment to the participants	Cost	300/-
			d) Transport facilities to the participants	Cost	100/-
			e) Material for practicals	Cost	200/-
			f) Tools and equipment for practicals	Rent	300/-
			g) Purchased Reference books	Cost	300/-
6.	Home Science Course for Women	A High School for women	Rent free furnished class room	Cost	600/-
7.	Training Course for Domestic Helpers	A High School for Women	Rent free furnished class room	Rent	600/-
8.	Two Courses in Mechanical Draftsmanship	A Trade Union of Textile Workers	a) Rent free furnished class room b) Purchased tools, equipment and material, and furniture	Rent (two courses)	10,000/- 3,000/-
			c) Provided stationery etc., to the participants	Cost (for two courses)	500/-
9.	Two Training Courses for Projector Operation	Department of Visual Education, Govt. of Maharashtra	a) Lent equipment for practicals b) Allowed their staff to deliver lectures	Rent for two classes	500/-

1	2	3	4	5	6
10.	Course in Industrial Electricity	An Enterprise manufacturing Rectifiers	a) Rent free furnished class room	Rent	1,000/-
			b) Provided stationery etc. to participants	Cost	100/-
			c) Helped in cyclostyling part of literature to be distributed to the students	Cost	100/-
			d) Purchased books for building up a small reference library for the benefit of the participants	Cost	300/-
			e) Purchased models required as teaching aids	Cost	200/-
			f) Provided equipment and tools for practicals	Rent	500/-
			g) Provided refreshment to the participants and visiting lecturers	Cost	300/-
			h) Provided transport facilities for educational visits	Cost	300/-
11.	Course in Supervisory Skills	An automobile concern	a) Well furnished class room (Air conditioned)	Rent	1,500/-
			b) Allowed participants working in 2nd shift to attend the course entirely during working hours		
			c) Transport facilities for visits	Cost	300/-
			d) Spent Rs. 400 - for providing transport facilities to visiting lecturers	Cost	400/-
			e) Facilities to a certain extent for cyclostyling course material	Cost	50/-
			f) 5 lectures were delivered by the staff free of charge resulting in saving of honoraria	Honorarium (Saving)	125/-
12.	Course in Domestic Services	A High School	Rent free furnished class room	Rent	400/-
13.	Language course in functional Marathi	A Community Library	Rent free furnished class room	Rent	400/-
14.	Two Courses in Boiler Attending	A Textile Mill	a) Rent free furnished class room	Rent	1,500/-
			b) Allowed use of the boiler house for practicals and demonstrations	Rent for two courses	2,000/-
15.	Two Courses in Workshop Calculations	A Community Centre cum High School	Rent free furnished class room	Rent for two classes	1,500/-
16.	Course in Supervisory Skills	Transmission Products Enterprise	a) Rent free furnished class room	Rent	1,000/-
			b) Paid Rs. 250 - in cash to Shramik Vidyapeeth	—	250/-
			c) Refreshment to the participants and visiting lecturers	Cost	200/-
			d) Allowed participants of 2nd shift to attend the class entirely during their working hours	—	—
			e) Helped to a certain extent in cyclostyling course literature	Cost	50/-
			f) Transport facilities for visits	Cost	50/-
17.	Course in Use of Verniers & Micrometers	An Engineering concern	a) Rent free class room	Rent	200/-
			b) Provided tools and equipments for practicals	Rent	100/-
18.	Course in Supervisory Skills	An Enterprise	a) Rent free furnished class room (Air conditioned)	Rent	1,000/-
			b) Transport facilities for visiting lecturers and for visits of participants	Cost	500/-
			c) Refreshment to participants and visiting lecturers	Cost	100/-
			d) Participants working in 1st shift were allowed to attend the course entirely during working hours		
				Total: Rs.	39,425/-

ANNEXURE III

**Description of Courses Organised by the Bombay Shramik Vidyapeeth—
A Few Examples**

COURSE IN WEAVING FOR AUTOLOOM WEAVERS

(*Organised from* 8-9-1968 *to* 9-12-1968)

1. DEVELOPMENT OF THE COURSE

To identify the nature and need for programme which could be developed by *Shramik Vidyapeeth*, a circular letter giving brief information about the aims and objectives of the *Shramik Vidyapeeth* and its approach to programming specific need based courses etc. was sent by the secretary of *Shramik Vidyapeeth Samiti* to a number of managers of the textile mills. In response to this letter, interest was expressed by a few managers of textile mills to have a course organised by *Shramik Vidyapeeth* for auto-loom weavers. Specific request was made by the manager of a textile mill for organization of a course in auto-loom weaving for workers. To explore the possibilities a series of meetings and discussions were arranged by the Principal of the *Shramik Vidyapeeth* with the management of the mill. These meetings were attended by the Mills Manager, the Planning Manager, the Labour Officer, and the Deputy Weaving Master of the mill. During discussions it was stated by the representatives of the management that since their mill had installed recently auto-looms, they would appreciate if a course could be organized in the operation of auto-loom for their workers who were then working on power loom. As the initial cost of installing auto-looms was very high, it was essential that these should be operated by workers with efficiency and with minimum damage to the fabric. As it was realised that the course in auto-loom weaving would be of interest to both the management and workers, the manager of the mill readily agreed to co-operate by providing necessary class-room facilities, use of auto-looms and other teaching, learning equipment etc. *Shramik Vidyapeeth* therefore, decided to organise the course.

2. DETERMINING THE EDUCATIONAL AND TRAINING NEEDS OF PARTICIPANTS

For determining the educational and training needs, a lecturer of the *Vidyapeeth* contacted the management and collected data regarding the job done by the auto-loom weavers covering all the elements of operation undertaken in running the auto-looms. Information regarding the level of general education, languages known by the auto-loom weavers and the level of job efficiency expected of them, the experience of operating the power loom which the workers had, and the time convenient to the management and the workers, were collected. It was proposed that the course should aim at developing quality conciousness among the auto-loom weavers, imparting knowledge of the structure and mechanism of operating the auto-loom, providing related skills for proper maintenance, and detecting the difficulties in the looms and getting assistance for repairs in time. Taking into account these needs, a curriculum was designed by the *Vidyapeeth*.

3. DESIGNING CURRICULUM

For designing an outline of the curriculum, a committee was set-up consisting of Principal and a lecturer of *Shramik Vidyapeeth*, Deputy weaving Master of the Mill, Planning Manager and a Senior Foreman of the Industrial Training Institute, Bombay. Suggestions and comments of the Mill Manager, Head of the Textile Deptt., Victoria Jubilee Technical Institute, Weaving Superintendent of the Mill and the Mafatlal Textile Training School, were incorporated by the *Vidyapeeth* in the curriculum design. The curriculum was finally discussed with the participants of the course during the initial session and the course content was moulded by the instructors teaching the course, according to their suggestions.

4. OUTLINE OF THE CURRICULUM : The curriculum outline was as follows

a) Introduction

Auto looms are being introduced by certain textile mills hitherto using plain looms to improve the production both quantitatively and qualitatively. A plain loom weaver operates four looms only, whereas a weaver on auto looms is expected to attend to 30 to 36 auto looms. Although use of auto looms cuts down the labour cost, its installation involves a huge capital investment. Unless the workers develop a necessary knowledge and skill to run the auto loom at optimum efficiency, the high capital investment will not lead to desired production which might result in loss to the factory and would ultimately mean less benefits to the worker. It was therefore necessary that the auto loom weavers have an opportunity to learn systematically the structure and mechanism of the auto looms, maintenance programme, causes of fabric damage and the necessary precautions to avoid such damages. To be efficient, a worker needs to know when and how to use the assistance of "jobber" or "tackler". The course was therefore, organised by the *Shramik Vidyapeeth* to provide an opportunity to educate and train the auto loom weavers who were interested in developing efficiency in the operation of auto-looms and thereby seek chances of advancement in their occupation.

Keeping in view the convenience of place and time, the course was organised at a Textile Mills, Fargusion Road, Lower Parel, Bombay-13. The course was conducted by experienced and qualified instructors in the language understood by the participants. The syllabus was designed by the experts keeping in view the educational level of auto-loom weavers, and their experience of operating the looms.

b) Objectives

i) To impart knowiedge to the participants about the mechanism of auto looms.
ii) To give them an understanding of the causes of fabric damage and the knowledge and skill to prevent such damages.
iii) To acquaint them with the maintenance programme of auto looms.
iv) To acquaint them with the system of auto-shed organisation.
v) To enable them with the identification of potential causes which result in stopping the loom unnecessarily.
iv) To help them understand the need for safety and acquaint them with the safety measures.
vii) To provide them the knowledge of the elementary principle of transmission of power.
viii) To tach them simple arithmetical calculations required in the operation of the looms.
ix) To enrich their lives by promoting their understanding of the industrial discipline, hygiene, and the laws which govern their work.
x) To provide them the knowledge for the attainment of the better efficiency level.

c) Course Contents

Unit (i) Automation in Weaving:

What is an autoloom ?, how does it differ from plain power loom; brief idea about mechanism of auto-loom; the problems of automation in looms.

Unit (ii) Mechanism of Auto Looms:

Working principles of auto looms; functions of various motions of the loom; drive for auto looms.

Unit (iii) Auto Looms Attachments:

Dobby; drop box; jacquard, ad auxiliary services

Unit (iv) Auto Loom Operations:

Warp and weft preparation for auto looms; gaiting of warp beam auto looms, the number of operations and the minimum time taken for these operations for economical weaving.

Unit (v) Quality of Fabrics:

Causes of fabric damage; remedial measures to avoid or rectify; damage to fabrics.

Unit (vi) Maintenance of Auto Looms:

Lubrications; quantity/quality control etc.

Unit (vii) Potential Causes which Result in Stopping the Loom Unnecessarily:

Causes—their effect on productivity; preventive measures, stopping of such; causes.

Unit (viii) Organisation of Auto Sheds:

Working conditions; working load; material handling with least wastage.

Unit (ix) Types of Auto Looms:

General idea about the different types of auto looms which are common in India:

Unit (x) Elementary Principles of Mechanism:

Types of leavers; belt drives chain drive; gears; elementary idea about cams.

Unit (xi) Simple Arithmetic:

Multiplication and division; addition, subtraction and multiplication of fractions; metric system of measurement; Rule of 3 and its application in calculation of wages.

Unit (xii) Understanding of the Work Environment:

Industrial safety; industrial hygience; labour relations; provisions in the factory affecting the working conditions; work discipline; plant house keeping.

5. METHODS AND MATERIALS

The instructors teaching the course relied not only on the lectures but used lecture-cum discussion and gave practical demonstrations. To facilitate teaching and learning charts of different looms were prepared specifically,. The participants were provided with blue prints of different parts and motions of auto looms and with cyclostyled notes on certain important topics. Films pertaining to auto looms and civic and cultural education were shown to the participants during the course. To get them acquainted with different types of auto looms and allied processes in textile industry such as spinning and weaving, sizing, and testing of yarn and cloth, visits were arranged for the participants to Victoria Jubilee Technical Institute, Silk and Art Silk Mills organisations, Bombay Textile Research Association and Spinning and Manufacturing Co.,

6. ENROLMENT

The scheduled dates of organising the course along with brief information were communicated to the workers through the notice board of the mill. Heads of the Departments were requested to make personal contacts with the workers. Participants were asked to make applications for admission to the course. A selection committee which consisted of the staff of the *Shramik Vidyapeeth* and the representatives of the management interviewed the candidates and finally selected 11 participants.

7. PROGRAMME SCHEDULE

i)	Date of commencement of the course:	Sept. 8, 1968
ii)	Date of conclusion :	Dec. 9, 1968
iii)	Total instructional hours :	100
iv)	Duration :	3 months
v)	Timings of the class :	1 P.M. to 3 P.M.
vi)	Place :	In the premises of Shri Ram Mills, Farguson Road, Lower Parel Bombay-13.

Shri Ram Mills and Sr. Foreman of Industrial Training Institute were obtained to teach the course on part time basis

Before the instructors started teaching the course, they were provided information regarding the nature of the course, objectives of the course, the background of the participants, the methods of teaching, use of teaching aids etc by the Principal and the Lecturer of the *Vidyapeeth* who were incharge for supervision of the course.

9. FINANCING THE COURSE

While developing the course, an agreement was reached between the management, of the Mill and *Shramik Vidyapeeth* in which the management agreed to provide the facilities for organising the course such as a well furnished classroom, access to auto shed for practicals and demonstrations, transport facilities for visits to other factories; getting the blue prints of auto looms prepared for the participants; and Rupees 1,000/- in cash for meeting part of the expenditure of the course. *Shramik Vidyapeeth* spent Rs. 630/- to wards payments of honorarium of the part-time instructors.

10. EVALUATION OF THE COURSE

The following steps were taken in terms of making an assessment of the course :

i) Initial test in the form of oral questions was conducted in the beginning of the course.
ii) At the end of the course, again an oral test was conducted.
iii) For making an overall assessment of the value of the course, a small questionnaire eliciting the opinion, impression and difficulties experienced was administered and suggestions were invited from the participants.
iv) The management of the mill was requested to send impression regarding to value of the course.

Out of the 11 participants admitted in the course, 10 successfully completed the course. The initial test revealed that the participants did not have proper knowledge of the various motions of auto looms, causes of fabric damage and its remedial measures etc. The final test given at the end, however, indicated that all the ten participants have had acquired better knowledge of the auto loom operations and, gained necessary skills regarding the maintenance, and method of checking damages. Two participants out of ten were promoted by the management for having shown the best results in production. According to the reports received from the management, the auto loom weavers who participated in the course were definitely making efforts to apply the knowledge and skill in minimising fabric damage and consciously trying to manufacture better quality of cloth. Almost all of them learnt the ability to attend to minor faults for which previously they had to run for the assistance of "Jobber' and "tackler" for getting the faults removed. This reduced the detention timings of the looms considerably.

Since the wages of these auto loom weavers were based on incentive scheme, i.e., if they produce more, cloth with less fabric damage they can earn more, the knowledge gained during the course was found to be very helpful. Appreciating the value of the course, the management of other mills rquested to repeat the course again for another batch of auto loom weavers. Therefore, keeping in view the suggestions made by the participants, instructors, and managers, the course curriculum was revised and another course for auto loom weavers was organised by the *Shramik Vidyapeeth* from Jan. 20, 1969 to April 31, 1969.

COURSE IN INDUSTRIAL ELECTRICITY

(Organised from 2.9.1968 to 31.1.1969)

the Design and Development Engineer, Administrative Officer, the Principal and the Lecturer of the *Vidyapeeth*. The discussions led to a decision that a course may be developed for electricians and sheet metal workers. The management realised that a need based course for these categories of workers in industrial electricity wold be of immense value to them as well as to the workers. The management also offered facilities to conduct the course in the premises of the factory and agreed to allow some of its experienced staff to participate in teaching the course.

2. DETERMINATION OF THE EDUCATION AND TRAINING NEEDS

Two members of the staff of *Vidyapeeth* visited various departments of the factory and through discussions with the head of the departments made study of the nature of job carried out by the prospective participants. Then applications in prescribed form were invited. These applications provided pertinent information regarding the educational level, nature of job performed, age etc. of the participants.

3. DESIGNING CURRICULUM

For outlining the curriculum a committee consisting of Head of the rectifier and equipment division of a Rectifiers Manufacturing Co., Senior Instructor in electricity, I.T.I., Lecturer (technical) *Shramik Vidyapeeth*, and the Principal, *Shramik Vidyapeeth*, was constituted.

The committee was guided by the experience of the engineers in the factory, the topics in the syllabus of the Industrial Training Institute which had a direct bearing on the work being performed by the workers. Suggestions of the Head of the Electrical Engineering Department of Victorial Jubilee Technological Institute were also saught. Suggestions made by the participants on the basis of their own difficulties were also incorporated in the curriculum. It was decided that the course should-aim at providing information regarding circuit reading, drawing reading, fault detection in transformers and motors, and the methods of reducing manufacturing defects in transformers and rectifiers. Keeping in view the educational background of the participants, it was decided to include elements of physics, especially of electrcity in the syllabus.

4. THE OUTLINE OF THE CURRICULUM

(i) Introduction

Electrical technology has developed considerably and it is almost impossible to find an industry wherein electricity was not employed. Hence trained electricians are a must for many industries.

The field of electrical engineering is vast and depending upon the nature of industry, electricians are required to perform jobs of diverse nature. This course was planned taking into account the nature of the work carried out in the factory by electricians and is designed to be useful to electricians working in similar factories.

Since the participants of this course were expected to have some amount of practical experience, the course was intended to supplement their knowledge and skills with the necessary theoretical background and help understand systematic approach in detecting faults, carrying out repair work and connecting appliances as per the given circuit diagram.

(ii) Objectives

a) To give participants a theoretical background in electricity and magnetism.
b) To acquaint them with D.C., A.C. single phase and three phase circuits.
c) To impart knowledge regarding induction motors.
d) To familiarize them with electrical instruments.
e) To prepare them for understanding the principles of rectifiers.
f) To acquaint them with I.E. rules.
g) To impart them with the skill in blue-print reading and circuit reading.
h) To help them develop safety consciousness.
i) To develop in them a right perspective towards work and promote better understanding of the work environment.
j) To impart them the knowledge in the use of standard hand books.

(iii) Syllabus

Unit I—Introduction

Safety precautions, elementary first aid, treatment for electric shocks.

Unit (ii)—What is Electricity?

Matter, structure of Atom, electric theory, E.M.F., and units of electrical quantities (volts, amperes, ohms, watt, Kw. Kv, Mw, Mv etc.)

Unit (iii)—Conductors and Insulators

Common conductors, their use, use of wire gauge, insulated conductors in general usage. grades, low, medium and high voltage, and common insulating materials, common electric accessories.

Unit (iv)—Simple Circuits

Series and parallel circuits, Ohms law and simple problems, and work, power and energy their interrelations, conversion of H.P. to Kw and *vice versa.*

Unit (v)—Magnetism

Magnetic terms, properities of magnets, magnetic materials, electromagnets and their applications, cork screw rule, right hand thumb rule, magnetic fields of current carrying conductors and coils.

Solenoids and its polarity—magnetic terms, and electro-magnetic induction.

Unit (vi)—D.C. Generators and Motors

Brief description of principles, types of D.C. generators and motors, in brief., functions and use of slip rings, split, rings and commutator. starting methods, and types of starter, and meggers.

Units (vii)—Electric Wires

Types, grades and sizes of insulated wires and cables (e.g. VIR, CTS, weather proof, PVC, PVC to PVC, multicored, armoured cables etc.)

Unit (viii)—A.C. Circuits

Terms in A.C. circuits viz., frequency, RMS value, definitions of capacitance and inductance, phase relationship, power factors, and very simple RLC circuits.

Unit (ix)—Polyphase Circuits (in brief)

Star and delta connection, and line voltage and phase voltage and their relationship.

Unit (x)—Transformers

Principal, transformer parts like cores, windings, shielding, breather, oil tubes etc., transformer windings in details, voltage relationships, formula transformer tappings, auto-transformers and current transformers, and special features of welding transformers.

Unit (xi)—Use of Standard Hand Books

Findings out capacities of conductors, cables and busbars from standard tables in hand-books and simple calculations, and types of fuses, determination of capacity of fuses.

Unit (xii)—Induction Motors

Principles, squirrel cage and slip ring motors, starting of induction motors, constructional details of induction motors, and different types of starters for motors with constructional details of starters and their parts, functions of each part of starters connections of starters with motors (Circuit diagrams of starters).

Unit (xiii)—Electrical Instruments

Classification, constructional details of moving iron, moving coil, dynamometer and hot wire instruments, details of meggar, use of shunts and multipliers, use of C.T. and P.T., Classifications as regards standard and suitability of current, and choice of instruments.

Unit (xiv)—Electronics

Theory of electrons, principles of diode, rectifier circuits (half wave and full wave) metal rectifiers, their parts, construction, working principles and use and mercury arc rectifiers.

Unit (xv)—Lamps

Brief description and principles of incandescent lamps, metal filament, vaccum lamps, gas filled, mercury vapour lamps, sodium vapour lamps etc.

Unit (xvi)—Switch Gear

Breif description of air circuit, breakers and oil circuits breakers, and earthing practice devices.

Unit (xvii)—I.E. Rules

Important I.E. rules regarding overhead service lines, earthing conduit pipe installation and wiring, power wiring switch board connections and house wiring .

Unit (xviii)—Principles of Blue Print Reading and Circuit Reading

Projections of simple solids, reading drawings and sketching, elevation plan and end view of simple articles, sketches of bolds, riverts, washers, keys, yokes and field poles, armatures, commutators (sectional view) conduits, conventional signs and symbols used in electrical circuits drawing and sketching circuit, diagrams of calls bells, transformer connections, rectifier circuits, induction motor circuits with starters, panel board circuits other simple circuits which were prevalent in the factory. Use of electrical sympols and signs, internal connections of transformers with tapping, connections of switch boards with electrical insirument and protective system, and practice in reading circuits used in the factory.

Unit (xix)—Related Trades

Brief description about soldering drilling and tapping, and drill grinding.

Unit (xx)—Practicals

Electric shock treatment; treatment for electrical burns; practice in using a steel rule cutting pliers, screw driver skinning the cable insulation jointing practice with single and standard conductors; cord splicing; joints of bare conductors straight; tee, western union and sleeve; practice in soldering including maintenance of blow lamp practice with electric soldering iorn; soldering aluminium conductor; connecting simple series and parallel circuits. (No separate practical); connecting different appliances with measuring instruments e.g. voltmeter ammeter etc. (No separate practical); practice in testing and finding polarity of supply; measurement of power and energy using voltmeter and ammeter; drilling and tapping practice: demonstration on magnetic fields; tracing the field of electromnets; measuring resistances by using series and shunt direct reading ohm meter; practical in using a megger; study of starters of D.C. motors; measurement of speed by using a tachometer or stroboscopic method. study in details of various types of starters of induction motors (slip ring and squirrel cage) practice in connecting starters to motors; practice in starting motors; practice in reversing the motors (use of reversible switch); connecting energy meters through C.T. and P.T.: verifying the transformation ratio of transformers; loading the transformers with resistive or mixed load; rewinding small transformers; cleaning and maintnance of transformers; use of silica jel in breathers, common faults occuring in transformers and their rectification; study of rectifiers, connecting rectifiers, and loading; attending to fault in rectification: diagnosing faults in induction motors and various types of starters—and possible remedies; sequence of operations in detecting electrical and mechanical faults in motors and transformers; sequence of operations in detecting faults in rectifiers; attending faults in welding transformers.

Work discipline: good social habits; health and hygiene: how to applying for a Job: and how to preparing for job interviews.

5. METHODS AND MATERIALS

Lectures followed by discussions, practical demonstrations and practicals performed by the participants under the guidance of the instructors, were the methods of teaching. Models were purchased by the factory as recommended by the instructors and the *Shramik Vidyapeeth* for use as teaching aids. Participants were provided with cyclostyled notes, diagrams and blue prints of electrical circuits. Films pertaining to safety with electricity; electromagnetism: Faraday's law; how electricity is generated: how does an electric motor works: atom and electrons; good social habits; and civic sense: aesthetic topics etc. were displayed to the participants during the course.

Field visits were also arranged for the participants to Central Training Institute, Bombay Industrial Training Institute, Bombay Bharat Bijlee, (A factory manufacturing transformers and electrical equipment and Cromption Greaves (factory manufacturing transformers and motors). An excursion was also arranged to provide an experience in group living.

6. ENROLMENT

For motivating workers to enroll in the course the details of the course were put-up on the notice board of the factory. The administrative officer of the factory also personally contacted workers for giving them information regarding the course. The Principal and the lectures of the *Vidyapeeth* had group meeting with the workers for giving them the idea of the work done by the *Vidyapeeth* and the purpose of the course being organised. Representative of the management also attended this meeting. A selection committee consisting of the lecturer of the *Vidyapeeth* and the administrative officer, interviewed the candidates and selected 26 candidates out of which only 19 joined the course from the first day and 16 completed the course successfully.

7. PROGRAMME SCHEDULE

i)	Date of commencement	— 2/9/-1968
ii)	Date of conclusion :	— 31/1/1969
iii)	Total instructional hours :	— 200
iv)	Duration :	— 5 Months
v)	Timings :	— 4.45 p.m. to 6. 45 p.m.
vi)	Place :	— Hind Rectifiers Ltd., Lake Road, Bhandup, Bombay.

8. FACULTY

The course was taught by Senior Instructor, I.T.I., an Electrical Engineer, Rectifier & Equipment, Lecturer (Technical) *Shramik Vidyapeeth*, and the Principal, *Shramik Vidyapeeth.*

In making selection of the Instructors, the recommendations of the Principal I.T.I. and the Chief Executive of the rectifiers enterprise were taken into account. Before they started teaching the Instructors were provided an orientation regarding the aims and objectives of the *Vidyapeeth*, the nature of the course, background of the participants, methods of teaching suitable for adults, use of teaching aids etc. by the Principal and lecturers of *Vidyapeeth* through individual meetings.

9. FINANCING THE COURSE

The *Shramik Vidyapeeth* paid an amount of Rs. 966/- to the part-time instructors as honorarium under agreement signed by the management of the rectifiers factory and *Shramik Vidyapeeth.* The management also provided well furnished class room, facilities for conducting practicals in the rectifier & transformer departments of the factory, transport facilities for visits to other factories, help in cyclostyling course material, diagrams and blueprints, models worth Rs. 300/-, and books worth Rs. 300/- for the reference library for the participants,

transport to visiting lecturers and refreshment to participants and lecturers during the course sessions.

10. EVALUATION

The initial test of the participants revealed that they were not familiar with the symbols used in electrical circuits, knowledge of electrical units, principles of transformers, rectifiers and knowledge of drawing reading etc. The final test conducted towards the end indicated the sufficient gain in knowledge.

From the answers received from the participants it is elicited that the course was found helpful for them in increasing their occupational skills and instilling confidence in them for performing their work. Some typical answers received are quoted below :

"I was not knowing about the connection of an auto-transformer before I joined the course. After completing this course I could connecte the auto-transformer without taking help from anybody" "Previously I was working without knowing why a particular operation should be done. Now I know the reason behind it and hence can work with some interest."

Two participants of this batch were given special increments after they completed the course by the management of the enterprise. Two other participants of this batch started private electrical contract work in their spare time after completing this course.

The immediate supervisors have reported that there was some improvements in the skill of the participants after they completed the course. The fact that two workers were given given special increments indicates that the management considered the value of the course.

The participants selected in this course were drawn from different departments. Hence the work performed by them also varied in nature. It was observed by the instructors that the participants were taking more interest in subjects directly related to their work. Some topics of the course were reported to be difficult by the participants to grasp and needed modification. All the instructors observed that the participants were taking keen interest in class room which was reflected in the discussions which took place in the class sessions.

The staff of the *Shramik Vidyapeeth* realised that the course contents needed reconsideration if it was to be repeated. The course was, however, considered successful in motivating the participants for improving their skills. The participants had shown satisfactory performmance in the final test conducted by the *Shramik Vidyapeeth.* It was possible for the *Vidyapeeth* to get substantial help in kind for conducting the course from the management.

Similar courses were further requested by a trade union in whose collaboration *Shramik Vidyapeeth* had organised earlier a course in mechanical draftsmanship. This reflected the general recognition of the courses of the type the *Vidyapeeth* organised.

A COURSE FOR SUPERVISORS

(*Organised from Nov.* 1, 1968, *to Feb.* 4, 1969)

1. DEVELOPMENT OF THE COURSE

At the time of planning new courses, *Shramik Vidyapeeth* issued a circular letter giving the purpose for which it has been established and the type of the programme it has been organising etc. to various organisations and enterprises. Management of a large automobile manufacturing factory expressed its desire to have a course for supervisors organised. The chief industrial engineer of the factory requested the *Vidyapeeth* to explore the possibilities. consequently a series of meetings were arranged by the *Vidyapeeth* which were attended by the Personnel Manager, Chief Industrial Engineer, Superintendent Department of Industrial Engineering. Labour & Welfare Officer and the Training Officer of the Automobiles Factory. The UNESCO expert, then working with the Department of Adult Education, NCERT also attended one of these meetings. During discussions, the management representatives appreciated the approach to programming adopted by *Shramik Vidyapeeth* and wished that the *Shramik*

Vidyapeeth should organise a course for the foremen and supervisors who have come up up from rank and files and need training, particularly in the art and skill of working with people, in improving production methods, and for developing leadership abilities.

2. DETERMINING THE EDUCATIONAL AND TRAINING NEEDS OF THE PARTICIPANTS

For determining the educational and training needs, a lecturer of the *Vidyapeeth* collected the pertinent information regarding the job performed by the supervisors; level of their general education, and languages known by them. To get an idea of the problems and difficulties faced by the supervisors, the lecturer visited different departments of the factory and also had discussions with the Chief Industrial Engineer, Labour and Welfare Officer and some of the supervisors. It was noted that the job description of the supervisors included duties such as distribution of the work in their sections at the starting of the shift; timings of the production according to the production schedule and machine loading; maintaining the quality and quantity of production; attending routine production problems; recording shift production, registering idle hours, and keeping periodical checks on material accounting. It was recognised that in view of the job supervisors were expected to perform, and the level of their general education and experiece, the course should aim at developing leadership abilities and communications skills.

3. CURRICULUM COMMITTEE

An outline of the curriculum was prepared by a curriculum committee which consisted of the Principal and a Lecturer of *Shramik Vidyapeeth* and the Chief Industrial Engineer, Suptd. Department of Industrial Engineering, Labour and Welfare Officer of the Automobiles Factory. Suggesstions and comments on the draft outline were obtained from the Professor incharge of supervisory courses at V.J. Technical Institute, Regional Director, National Productivity Council, Management consultant, Deputy Director General, Central Labour Institute, and Executive Secretary, Bombay Productivity Council. During the initial sessions the curriculum was thoroughly discussed with the participants and their suggestions were incorporated in the curriculum.

4. THE CURRICULUM OUTLINE

The curriculum outline of the course was as follows:

(i) Introduction

A supervisor is a vital link between the departmental heads and the workers. He is the person who is constantly on shop floor and is mainly responsible for the quality and quantity of the products. A supervisor has to get the work done. Although most people can get a job done but what really matters, is to get it done at a minimum possible cost with the best use of men, machines and materials availalble. To achieve this, a supervisor should not only be trained in the technical skills, but he must also have qualities like leadership, cost consciousness, resourcefulness, creative attitude, and an ability to analyse scientifically the production methods. Improving production methods is one of the important facets of effective supervision.

Thus trained supervisors are in a better position to increase productivity, and as such, are an asset to any industry. Considering the needs of the supervisors a short-term course in supervisory skills was planned.

(ii) Objectives

(a) To acquaint supervisors with the essentials of good supervision.
(d) To give them insight into the principles of management.
(c) To develop in them the skills in communication and in giving job instructions.
(d) To develop in them analytical approach in breaking down operations and in improving production methods.
(e) To develop in them the qualities of leadership.
(f) To acquaint them with the principles and the process of systematic planning.
(g) To develop in them cost consciousness.
(h) To make them quality conscious.
(i) To strengthen in them the importance of preventive maintenance.

(j) To make them safety conscious.
(k) To acquaint them with industrial legislation pertinent to their job.
(l) To enable them to perform their routine work in an efficient way.

(iii) Syllabus

Unit (i)—Supervision

Principles of supervision; essential qualities of good supervisor; duties of supervisors; role of supervisors in management; responsibilities of a supervisior; and extent of powers delegated to supervisors.

Unit (ii)—Management

Philosophy and concept of management; principles of management; and functions of management.

Unit (iii)—Communications

Aims of communications; need to prepare instructions; and planned communications from boss to boss, between colleagues, to subordinates.

Unit (iv)—Job instructions

How to get ready to instruct; how to instruct; demonstration of verbal instruction; communication process; communication for line operation; communication with seniors; and communication under noisy conditions.

Unit (v)—Job methods

Practical plan to make better use of available man power, machines and material, 4 step method i.e. analyse, challenge, develop and introduce; aids for improving methods

Unit (vi)—Job relations

How to develop better human relations; four step card for job relations training; individual differences; prevention of problems; foundations for good relations; how to get–opinions and feelings; case study method; supervisor's total work relationship; and effect of change.

Unit (vii)—Production planning and control

Need for planning; elements of planning; scheduling; machine loading; production control; factors to be considered while arranging shifts; and supervisors planning.

Unit (viii)—Productivity

Concept of productivity; factors which increase productivity; factors which tend to reduce productivity; cost consciousness; minimising waste in material, tools, and equipment; and man power; avoiding delays; reduction of scrap; taking actions in parallel rather than taking in series; utilizations of scrap for production.

Unit (ix)—Work study

Role of supervisors in work study; elementary idea about flow and handling of material charts, man and machine charts, multiple activity charts etc.

Unit (x)—Quality control

General idea about s.q.c.; inspection methods; tools, equipment for inspection; and periodical inspection of product in each stage of production.

Unit (xi)—Maintenance

Role of supervisor in maintaining machines, tools, and equipment in good condition; central or departmental maintenance; minor repair work; general idea about preventive maintenance; and important hints on general maintenance, and repair work.

Unit (xii)—Job Safety

How accidents affect productivity; causes of accidents; preventive measures; safety propaganda and education; methods of stocking material; importance of good plant house keeping; effect of unhygienic conditions on productivity; effect of light ventilation on productivity; and promotion of cleanliness.

Unit (xiii)—Industrial legislation

Purpose; supervisor and industrial legislation; problems of discipline; meaning of discipline; working with people; why people react; effects and causes of indiscipline, problems arising from indiscipline; techniques of promoting discipline.

Unit (xiv)—Routine Work

Recording shift production, rejection, idle hours etc; importance of such recording; effective methods of recording; importance of interpreting records; investigation of causes if the production is subnormal or the % rejection is increasing or idle hours are increasing; and steps to take remedial measures.

Unit (xv)—Routine production problems and their solution

(Seminar Session)

5. METHODS AND MATERIALS

For teaching the course methods adopted included group discussions, case study and role play. Films on "Fact finding", "Problems of supervision", "Power press guarding", "Productivity for progress", "Grievance hearing", "My friend the enemy", "Personal protective equipment," and "Statistical quality Control" were used in the course. Field visits to the safety museum at the Central Labour Institute, Bombay, and two other engineering industries, viz. Godrej were also arranged for the participants. A special feature of the course was a "Problem solving" session in which a group of experts answered the problems related to work and life in general raised by the participants.

Mimeographed notes on certain selected topics were supplied to the participants to serve as a basis for discussion. Certain reference books recommended to the participants for study by the Instructors, were purchased by the management for the participants.

6. ENROLMENT

The Chief Industrial Engineer was requested to display circular giving detailed information of the course on the notice board in all the departments. Thereafter, head of the departments of factories were also requested to make personal contacts with the superivisors with a view to acquaint them with the course. Participants were then selected on the recommendations of the departmental heads. One of the conditions for enrolment to the course was that the participants should have knowledge of english. In all 44 participants were selected out of which 40 attended the course from the very beginning and 33 completed it successfully.

7. PROGRAMME DETAILS

i)	Date of commencement	Ist November ,1968
ii)	Date of conclusion	4th February. 1969
iii)	Total no. of instructional hours	50
iv)	Number of participants	40
v)	Medium of instruction	English
vi)	Place	Premier Automobiles Limited Kurla, Bombay-70
vii)	Timing of the course	1.30 p.m. to 3.15 p.m. (Entirely during working hours)

8. INSTRUCTORS OF THE COURSE

Instructors who taught the course on part-time basis included Professor of V.J. Technical Institute, Dy. Director, Ghatkopar Institute of Management, Labour & Welfare Officer,

Dy. Director, National Productivity Council, Lecturer, *Sharmik Vidyapeeth*, Chief Industrial Engineer, and Head, Dept. of Psychology, of Tata Institute of Social Sciences, Dy. Director and Asstt Directors of Central Labour Institute.

Before Instructors started teaching the course, they were given briefing regarding the nature of the course, objectives of the course, the background of the participants and the methods of teaching etc. by the Principal and the Lecturer of the *Sharmik Vidyapeeth* incharge of supervising course. Wherever necessary, meetings were arranged for instructors to discuss with the management the exact nature of training they need and the emphasis which should be given in teaching.

9. FINANCING THE COURSE

While developing the course an agreement was arrived at between the management and the *Sharmik Vidyapeeth* in which the management agreed to provide for organising the course a furnished class room; transport facilities for field visits, help in getting the literature and drawings required for the course cyclosyled, Rs. 400/- in cash towards the conveyance of the visiting instructors; free instruction by competent staff of the factory. *Shramik Vidyapeeth* spent in all Rs. 675 in cash towards payment honoraria to the visiting instructors for the entire course including that for the experts who attended the "problem solving—session".

10. EVALUATION OF THE COURSE

No formal test was conducted in the initial stages. However, every instructor used to ask a few questions before starting class session so as to asses the level of knowledge of the participants and accordingly to plan his instructions. The course mainly dealt with the principles of supervision in which certain skills, like skill in giving instructions, skill in handling human problems, skill in improving production methods etc. were to be developed. Therefore a test in the traditional form was considered to be not useful. Hence the report of the management regarding improvement in their work after a few months from the date of completion of the course was considered to to be the real test. At the end of the course the participants were given an assignment in the form of home work which they completed within 15 days. Their answers were examined by the experts form the same factory and in all 33 participants completed the assignment out of which 16 participants secured A grade and 17 participants secured B grade. The participants found the course useful from the point of view of developing certain important supervisory skills, namely skill in giving instructions, skill in improvement of methods, and skill in human relations. One participant had introduced change in the design of a trolley for speeding up production. Another participant was found to have adopted workstudy techniques for improving production methods. The participants also made conscious efforts to improve communications and it was reported that they were now taking more care while giving instructions. The report of the Chief Industrial Engineer as quoted below gives an indication of the assessment of the utility of the course to employer.

"We would like to mention that the 3 months' course organised in our organisation was for the purpose of developing and improving the supervisory skills of supervisory personnel from the shop floor in order to enable them to carry on their job smoothly and efficiently. It is our impression that in a fair measure this course has certainly achieved the desired results. The course was found useful in educating the supervisory personnel most of them have come up from the rank and help them to understand their role in carrying out their assignments in an improved manner. They have also improved their work methods gradually to some extent. They are found more co-operative in their approach. There is some awareness in the participants to aim for better performance. They do consider now human aspect in dealing with their workmen."

11. GENERAL REMARKS

As more requests were received from other factories for organising the course, *Shramik Vidyapeeth* organised three more courses in supervisory skills. The courses organised at other factories were on similar lines except a few modifications in the syllabus as so to suit the exact needs of the participants according to the nature of work performed in the particular unit. On the basis of experience of organising the first course, the *Vidyapeeth* made efforts at improving the teaching methods. It was realised that in such courses more emphasis

should be on case studies, group discussions and role plays, rather than on lectures. So far as human relations are concerned the case study method was found to be the best as it involved the participants in discussions.

COURSE IN BOILER ATTENDING

(Organised from 23.9.69 to 30.1.70)

1. DEVELOPMENT OF THE COURSE AND DETERMINITION OF THE NEEDS

The following indicated need for developing this course—

i) Study of advertisement in newspapers demanding trained boiler attendants.
2) An article published in local newspaper, stating the need for trained boiler attendants, and describing the career of boiler attendants.
3) Suggestion from the President, of a Spg. & Mfg. Co. who is also a member of *Shramik Vidyapeeth Samiit*, pointing out the dearth of boiler attendants in the textile and chemical industries and the need for their training.
4) Indication from the Mill Owners' Association that the category of Boiler attendants was regarded as a short category (i.e. shortage of trained persons in this category).

Consideration of the above led to a decision for planning a course after ascertaining the needs, by approaching the managers and chief engineers of various textile mills and associations of textile mill owners and silk mill owners. For this purpose, the Principal and Lecturer (tech) of the *Vidyapeeth* consulted a number of Chief Engineers, Boiler House Engineers. Mill Managers of Textile Mills, Chief Inspector of Boilers & Smoke Nuisances and Labour Officer, and Millowners' Association. Through discussions with these persons it was found that:—(i) The textile and chemical industries were in need of a trained boiler attendants; (ii) persons working in a boiler house as boiler coolies, firemen etc. for a period of 3 years and persons working as IInd class boiler attendants for a period of two years, though eligible, to appear for II and I class boiler attendants examination conducted by government did not succeed even after 4 to 5 attempts as they did not have opportunity to acquire necessary knowledge and skills. Many candidates appearing for these examinations did not have even the elementary knowledge of readings of thermometers and pressure gauges; (iii) most of the firemen and boiler attendants had knowledge only of one or two types of boilers. They did not however possess adequate knowledge about modern automatic package type boilers and the control on modern automatic boilers. This restricted their horizontal as well as vertical job mobility; (iv) many boiler house engineers observed that boiler attendants were not able to adopt modern techniques for increasing the efficiency of boilers because they were not properly trained. and (v) many boiler attendants had not formed the habit of keeping the boiler water level within specified limits which either causes accidents or generation of wet steam.

2. DESIGNING CURRICULUM

A committee consisting of engineers, boilerhouse inspectors, lecturers of technical institutes and staff of *Shramik Vidyapeeth* was set up to prepare the curriculum.

The suggestions of the participants of this course were also incorporated in the syllabus by the Instructors teaching the course.

3. SYLLABUS

The final syllabus adopted in teaching the course was as follows:—

a) Introduction :

Textile, chemical and allied industries were always in need of trained boiler attendants. However, according to the Boiler Act, only those having IInd class boiler attendant's certificate

were considered eligible to work as boiler attendants. Industries were now introducing modern package boilers instead of lancashire boilers. This made necessary that the boiler attendants should have facilities for training so that they could acquire knowledge and skill for economising fuel, preventing accidents and in increasing the efficiency of boilers. For want of systematic training facilities, textile mills and chemical industries had to rely on untrained boilers. Considering these needs a systematic training course was developed by *Shramik Vidyapeeth* for boiler attendants.

b) Objectives of the course

i) To give an understanding in fundamentals of boilers & fuels used in boilers.
ii) To acquaint boiler attendants with the construction and functions of various boiler mountings, and accessories.
iii) To familarize them with different types of boilers.
iv) To help them understand the duties of boiler attendants.
v) To give them thorough understanding in detecting, rectifying preventing faults in operating boilers.
vi) To acquaint them with periodical tests of boilers.
vii) To familarize them with boiler rules and regulations.
viii) To familarize them with methods of increasing efficiency of boilers and economising fuel consumption.
ix) To make them duty conscious.
x) To develop a right perspective in them towards work.

c) Course Contents

Unit (i)—Fundamentals

(1) What is a boiler; (2) Working principles of boilers; (3) Classifications of boilers (i.e. smoke tube or water tube), (4) Knowledge of different types of fuels used in boilers.

Unit (ii)—Boiler Mountings & Accessories

Parts, working principles and functions of (1) Feed pump and injectors ; (2) Valves and cocks used on boilers; (3) Different types of safety valves; (4) Pressure gauges and waterl evel indicators; (5) Atomisers, superheaters, economiser, feed heaters, feed filters, forced and induced draft appliances, mechanical stokers etc. (6) Steam traps, steam seperators.

Unit (iii)—Types of Boilers

(1) Lancashire boilers; (2) Cornish boilers; (3) Water tube boilers; (4) Package boilers, (5) Locotype boilers; (6) Vertical cross tube boilers; (7) Advantages and disadvantages of these types of boilers; (8) Comparative study of these types of boilers and factors to be considered while selecting a boiler.

Unit (iv)—Duties and responsibilities of boiler attendants
Unit (v)—Rules and regulations for boilers
Unit (vi)—Boiler attending and attending to faults

(1) Precautions to be observed and correct procedure for performing operations like firing, smoke prevention, generation of steam, and entering in a boiler for inspection; (2) Importance of operations like frequent cleaning, removing scales and dirt from heating-surfaces, supplying clean water to boilers; (3) Taking readings of various gauges, thermometers, salinometer etc; (4) Importance of lagging on steam pipes and boiler shells and replacing damaged laggings (5) Faults which occur in boiler parts and mountings and remedial measures, (6) Why water should not be allowed to be deposited in steam pipes and precautions to be observed while removing water from steam pipes; (7) Knowledge of correct feed water temperature, (8) Importance of maintaining the level of water within the specified limits and what happens if the water level is below or above normal (9) How to judge whether an atomiser nozzle requires replacements. Importance of atomiser (10) How to attend faults or situations like shortage of water, bulging or cracking of flat plates, bursting of tubes; (11) How to prevent accidents on boilers; (12) Precautions in lighting the boilers and importance of pre-heating oil fuels; (13) Causes and remedy of fuel gas explosion; (14) Precautions against priming, carry over and water hammer. Dangers of overloading; (15) Methods of cutting in and cutting out sister boilers from a battery; (16) Importance of feed water quality in modern package boilers. (17) Study of modern oil firing method, modulation, ratio of oil to air: Knowledge of modern automatic appliances fitted to oil firing system; (18) Dangers of flame

impingement; (19) Function of chimney; (20) Need for acting promptly during low-highwater level casualties, feed pump and injector failures, fuel oil system casualties, water in fuel oil, loss of fuel oil; (21) Caution to be observed when steam and water escapes from ruptured parts of the boiler; (22) Action to be taken when minor or major fire in the boiler room occurs.

Unit (vii)—Testing of Boilers

(1) Importance of periodical tests; (2) Different types of periodical tests and methods of testing, tests like 'steam test' and 'hydraulic test'; (3) Periodical inspection and tests on boiler mountings, firegrates, fusible plugs and other parts.

Unit (viii)—Efficiency of Boilers

(1) What is efficiency of boilers; (2) Importance and advantages of running boilers at highest possible efficiency; (3) Factors which tend to reduce efficiency of boilers: (4) How to improve efficiency of boilers.

Unit (ix)—Practicals and Demonstrations

(1) To charge the boiler with fuels, banking (2) How to prevent smoke; (3) How to blow test cocks and water gauge tubes; (4) How to replace gauge glasses and what factors show faulty water (5) How to reduce pressure on safety valves and how to use blow down cocks or valves; (6) How to replace a fused fusible plug; (7) How to set high steam and low water safety valves; (8) How to fit main hole doors, hand hole doors or other similar coverings; (9) How to pack glands of pumps or valves; (10) How to fit cocks and valves (11) How to prevent smoke, causes of smoke, indications of densities of smoke; (12) Use and adjustment of dampers according to load conditions; (13) How to assemble parts of feed pumps or injectors; (14) If possible, as many boilers mountings as available may be dismantled diassembled and their parts be studied and to reassemble the parts.

Unit (x)—General Instructions

(1) Communications with seniors, colleagues and sub-ordinates; (2) Proper mode of giving and taking instructions: (3) Boiler attendants as emergency personnel; (4) Actions liable to be taken for misconduct.

Unit (xi)—Associated Instructions

(1) Industrial health and hygiene; (2) Labour relations; (3) Citizenship & participation; (4) Hierarchial relations; (5) Civic responsibilities; (6) Productivity; (7) Beauty in fine arts; (8) Science in everyday life; (9) Hints on self education.

4. METHODS AND MATERIALS

Lecture with the help of charts and sketches, practical demonstrations, question answer session with the participants; group discussions in which the participants discussed about various topics under the guidance of the lecturers, and visits to different boiler houses were the methods adopted in teaching the course. Important charts were got prepared by *Shramik Vidyapeeth*. The participants were also provided with different printed sketches of boilers and boiler mountings and accessories. When boilers were to be opened for inspection by the boiler inspector periodically these were kept open for about 15 to 20 days. *Shramik Vidyapeeth* took advantage of such occasions and arranged visits to few mills and Boiler House and Heat Engine Laboratory at V.J.T.I. for studying different types of boilers.

Films pertaining to physics, civic sense, science, safety, cultural aspects and general knowledge were shown to the participants.

In order to provide envioronmental education a bulletin board was put up in the class room on which clippings from newspapers pertaining to day to day happenings, related to cultural aspects, important political events information etc., were displayed for the benefit of the participants.

5. ELIGIBILITY

Conditions for eligibility were: (i) Participant should be literate and (ii) he should have

atleast one year's experience in boiler house work. Although it was proposed to select only those persons who have passed atleast seventh standard, on the instance of office bearers of Millowners' Association, educational qualification was related for participants having over 5 years practical experience.

6. ENROLMENT

For enrolment circular letters were sent to textile mills and industries employing boilers giving details of this course with request to depute suitable candidates for training. The Mill-owners' Association was requested to address circular letters to all member mills mentioning details of the course and direct them to encourage boiler house personnel for taking advantage of the course offered by *Shramik Vidyapeeth*. Information of this course was also published in the monthly "GIRNI SAMACHAR" published by the Millowners' Association which had a wide circulation among textile workers. The staff of the *Shramik Vidyapeeth* visited various textile mills and explained the details of the course to their respective managers, chief engineers and labour officers and sought their co-operation for deputing participants.

In all 23 workers were sponsored by 12 textile mills to participate in the course.

7. VENUE FOR THE CLASS

The course was organised at the premises of a Spg. & Mfg. Co. which besides centrally situated, was considered to be convenient to participants coming from various mills. The President, of the Spg. & Mfg. Co. offered free furnished class room at the premises of the mills and also permitted the use of boiler house of the mills for practical demonstrations to the participants in the course. Certain boiler mountings and accessories lying as scrap materials were also allowed for class room demonstrations by the mills.

8. PROGRAMME SCHEDULE

i) Date of commencement	23rd September, 1969
ii) Date of conclusion	30th January, 1970
iii) Total number of instructional hours	100
iv) Timings of the class	4.30 p.m. to 6.00 p.m.
v) Venue	Century spg. & Mfg. Co., Globe Mills Passage Worli, Bombay-13

9. FACULTY

The faculty for teaching the course on part-time basis included,

Lecturers, from Victoria Jubilee Technical Institute (V.J.T.I.); Engineers from Sitaram Mills, Phoenix Mills: Product Manager Wanson (India) Ltd; Prof. R.V. Sohoni, Ruparel College; Dy. Director National Productivity Council; an ex-Professor of Ismail Yusuf College, and Librarian Siddharth College of Arts & Commerce.

These instructors were briefed through individual meetings by the staff about the aims and objects of *Shramik Vidyapeeth* and the course. Teaching methods and syllabus were also discussed with them.

10. FINANCING THE COURSE

Shramik Vidyapeeth spent about Rs. 1300/- towards honoraria to visiting lecturers and a mill provided well furnished class room and permitted use of tools etc for this course.

11. EVALUATION OF THE COURSE

The evaluation procedure consisted of test in the form of oral questions in the beginning and at the end of the course. For making overall evaluation, a small questionnaire for eliciting the opinion, inviting impressions and suggestions of the participants was given to the participants. Comments of the engineers of boiler houses of the sponsoring agencies were also invited. The instructors were also asked to give their suggestions for improving the course.

The initial test administered to the participants for this course revealed that most of them lacked knowledge of the structure and functions of different components and accessories of boilers. They had little or no idea regarding the ways and means for economising the fuel. Some of them did not know even the names of the various boiler mountings. Even the participants who had studied up to 4th or 5th standard, also had difficulty in reading thermometer, pressure gauges etc. They did not have any idea about the units of heat, temperature and pressure. The final tests taken at the end indicated definite improvement as far as gain in knowledge of the participants was concerned.

All the participants stated that they received knowledge which was relevant for their day to day work. Quite a few of them also felt that by attending this course they had become confident of getting success in the examination conducted by the state government for the IInd class and Ist class boiler attendants. From the answers received from the participants it was seen that all of them have become cost conscious and were trying to apply the knowledge gained in improving the efficiency of boilers. Some specimen reactions of the participants are—"I welcome the idea of organising such courses for firemen and boiler attendants. From this course I learned about the temperatures which should be kept for oils entering the furnace and the temperatures of feed water. I am adopting the same temperatures now and I find that this had helped in economising the fuel consumption. Previously, I was not fully conversant with the skill of fitting and adjusting the water gauge as a result of which it used to get spoiled very quickly. After I learned the correct procedure from attending this class I adopted it and found that I could economise the number of water gauge glasses used per year because instead of 12 water gauge glasses per year I have brought down the consumption of gauge glasses to 4 per year. I have also learned useful methods of providing packings to feed pumps"; "By attending the classes, I have acquired an insight into the measures to be taken for preventing breakdown and accidents. When the gauge glasses of our boiler had broken, I could fix them immediately by adopting the techniques learned in the course without waiting for my supervisor"; "Now I confidently operate while I work in the boiler house"; "I have learned how to economise fuel and how to increase the efficiency of boilers"; "I have gained thorough knowledge of boilers, boiler mounting, and boiler accessories which is important for efficient work"; "we have tried the knowledge of adjusting the dampers for increasing boiler efficiency and have found that by using the methods taught in the class, oil consumption could be reduced"; "Once in my company the boiler by mistake was overfilled with water. The water started coming out of the safety valve. Since I knew what to do, it was possible for me to prevent a major accident and breakdown"; "In my boiler house most of the persons are uneducated. My senior boiler attendant was not giving me correct information. Now I have passed the IInd class boiler attendants examination"; "By adopting the methods taught in the class, I find that maintenance of boilers has become easier. I am experiencing less difficulty in attending boilers after I completed the course". Two participants who attended the course have succeded in getting through the second class boiler attendants examination.

Reports regarding performance of the participants in this course were invited from the chief engineers of the mills which deputed participants, although it was too early to expect the performance report soon after the completion of the course from the employers, there was a general indication in their responses that those who participated in the course were doing much better operations. As the value of the course for boiler attendants was realised, requests were made by the employers to organise more courses of this type. As a result of this *Shramik Vidyapeeth* organised a few more course for boiler attendants. Subsequently, Millowners' Association became willing to ask its member mills to remunerate Rs. 40/- per participants deputed by them in the boiler attendants courses organised by *Shramik Vidyapeeth* to meet part of the cost involved, in organising the course.

The course was considered useful in meeting to a certain extent need felt by the textile industries and provided the most wanted training facility for the boiler attendants. There was no difficulty in the course for getting participatnts sponsored by their mills. Participants were found willing to attend and avail of the opportunity not only for training but also for acquiring knowledge and skills which could be subsequently helpful to them in taking up government examinations successfully. Out of 24 participants who registered to attend the course, 14 participants completed the course successfully. Two of these also completed the boiler attendants examination successfully and secured better wages.

The instructors who taught the course appreciated the course contents and the way it was designed. Their suggestions for further improvement in the course which were found to be useful were taken into account in organising the subsequent courses by *Shramik Vidyapeeth.*

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