Session : TVET in school education

Keys to success of skills training in schools : Multi-skill Training and Community Services (Vigyan Ashram Experience)

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Abstract :

Majority of population which is dropped out of the school earn their livelihood as a workforce. They acquire their skills by ‘Learning while doing’ method. This informal method of learning skills has many shortcomings. Vigyan Ashram (www.vigyanashram.com) has worked on the shortcomings of those methods and providing training to rural youth by ‘Learning while doing method in real life situation’. This paper will present learning’s from 31 years of experience in implementing skills training program for rural youth. It shows, how multi-skill training and community services are successful strategies for skills training. On the job training (OJT) is useful in an organized industry. It cannot be applicable for skills training for unorganized sector. This paper will present how absence of development in the community, can be used as an opportunity to give hands on training to students. It will also prove by examples, how the community services can be used as an important tool for updating the curriculum & making it relevant. At the end the paper will argue that vocational training cannot be successful without strong work centric education at the school level. VA is successfully implementing pre-vocational program ‘Introduction to Basic Technology (IBT)’ in the formal school (Class VIII – X) on the above principles. The paper will describe impact of integrating work and education. It will also show present Govt program of introducing trade based vocational education at IX and Xth are contradictory to educational principles and lessons learnt in the past of similar efforts.

Introduction :

It is good that ‘Vocational education’ in schools is drawing attention of policy makers. Integrating vocational training in secondary school is not a new idea. Several efforts were made since 1954 under different schemes to introduce technical / skills training in schools. Pre-vocational program was recommended during education policy of 1986 and under ‘Centrally sponsored vocational scheme’ in 1998. The scheme was started with the objective to divert 25% of students to vocational education. In reality barely 5% students enrolled for vocational course at plus two stage in 2004. It is necessary to learn from the previous experiences so that we can avoid repeating the same mistakes in future.
Vigyan Ashram (www.vigyanashram.com) located in village Pabal in Pune district is working on promoting ‘Learning while doing’ methodology in secondary school since 1983. The program is recognized as ‘pre-vocational’ program by education dept and vocational education dept of Maharashtra state. The program ‘Introduction to basic Technology (IBT)’ was started as an experiment in 1987, with the permission of SSC board, has evolved over the years. It was started on experimental basis in 3 schools in 1987. The IBT program was piloted in 15 schools till 1995, 23 in 2001. Today the program is implemented in more than 122 schools in 4 states. What is remarkable is the number of schools implementing the program always kept on increasing. This is irrespective of Government funding the program. Success of IBT program is able to attract support by various foundations and adopted by multiple partners.

The paper will discuss about typical problems faced in the past while introducing vocational education in schools. On this background, this paper will discuss strategies that made the IBT program stand out from others! This paper will bring out Multi-skill training and providing services to communities as two important strategies for making vocational program in secondary schools a success.

Reason of failures of previous Pre-vocational programs at secondary level
All previous efforts of vocationalisation of secondary education could not deliver expected results. Important reasons of failure of the scheme are as follows:

i) Curricular problem – The curriculum was mainly trade based. Its structure is almost similar to the ITI’s. The content is very heavy and it was taught like any other academic subject. Theory followed by some mandatory practical’s made the program ritualistic.

ii) Negative perception of society about the pre-vocational program – Working by hand is always looked down by society. It was always perceived for students not good at studies and who cannot afford higher education due to financial reasons. Generally, children of elite parents did not opt for this program.

iii) Failure of the passouts from vocational program – Vocational education is always expected to result in a livelihood opportunity. The same expectation is wrongly made from vocational program at secondary schools. At secondary level, age group of students is 12-14 years. To become employable, they need to attain minimum 18 years of age. Therefore impact of pre-vocational in schools is difficult to measure in terms of direct employment.
iv) Administrative problems: Provision for staff and instructors were made almost on the line of ITI and technical schools. Fixed trade, recruitment of specialized teachers by creating new positions made the program financially unviable.

National curriculum framework (NCF2005) focus group on ‘Work and Education’[1] wrote a detailed critic of present policy of vocational education at plus two stage. It has suggested a new approach of ‘Work centered Education (WCE)’ for secondary schools. It has suggested implementation of WCE in all schools from class I – XII. The program will be based on Gandhiji’s idea of ‘Nai Talim’ in which ‘Work is a medium of education’. Students are involved in various productive works to understand different curricular areas viz. maths, science and social sciences. It has also stressed that period of conducting experimentation was long over and there is enough expertise available in the country to overcome the drawbacks experienced in previous attempt of introducing vocational education in schools. It has listed several such experiments in the country, one such experiment is ‘Introduction to Basic Technology (IBT)’ program in Maharashtra. IBT program tried to provide answers to some of the problems listed above.

Solution: IBT program in Maharashtra

Vigyan Ashram (www.vigyanashram.com) believes in ‘Learning while doing in real life situation’ as a ‘Natural way of learning’. This is the method by which a child learns his mother-tongue in 2 years. It is the method by which we learn to swim, drive, cook. Almost all things which we can ‘Do’ are learned by ‘Learning while doing’ method. Most of our skilled work force learns their skills by this method.

This method is so effective that it can train school dropouts into entrepreneurs and innovators.

VA has successfully introduced this method in 122 + schools in 4 states. Though IBT is categorized as ‘pre-vocational’ program, its objectives are more in line with the objectives of Work centered Education of NCF2005.

IBT program is implemented in formal schools from class VIII – X std. In this program, basic hand tools and conventional machines for fabrication, agricultural tools, electrical instruments etc are available in the schools. 20% of school time (10 school periods per week) is given for carrying out IBT activities.
Basic Principles of IBT program is as follows:

i) **Learning While Doing**: There is no classroom training. Students will actually work by hand, they will learn while doing the things. They will learn about quality, customer satisfaction, costing and pricing by working in real life situation.

ii) **Multi skill training**: ‘Nature’ is the syllabus for IBT program and it is divided into four sections as shown in fig.1. Training in multiple skills helps to broaden horizons of experiences of the student. S/he becomes a handyman. It helps him in deciding his preferences for vocation in future. Most of the problems at ground level need multidisciplinary approach and hence multiskills helps. Students become jack of all skills and decide to become master in one skill later.

iii) **Community Services**: Using basic tools in the schools, students provide various services to the community at modest cost. The student gets training in real life environment. Cost, Quality, Delivery etc are better learnt in real life situation. Community gets the services which otherwise would not have been possible in a village. For e.g fabrication, plumbing, soil analysis, electrical appliance repair etc.

iv) **Instructors as Entrepreneur**: Young skilled persons from the community with demonstrable skills works with the school as an ‘Honorary teachers’. He uses facilities of the school and with the help of students gives services to the community. He is free to practice his enterprise using facility in the school.

**Community services:**
Community services are important strategy of IBT program. It helps in keeping the program dynamic and updated and in line with the requirement of community. There are lots of work requirement in the school and surrounding. This can become good hands on experiences for students. It creates a sense of fulfillment in students and increases their
confidence to solve their own problems. Few representative examples of community services given in last few months in IBT schools:-

i) Students did water audit and fixed leaking taps using plumbing tools in Devalapar village (Dist.Nagpur)

ii) Students carried out electric wiring of their classroom. They learned from estimation, material selection, drawing wiring diagram, actually carrying out wiring etc. in Jamgaon school (Dist.A.Nagar)

iii) Students fabricated cycle stand for their school in shindavane school (Dist.Pune).

iv) Students make the LED light circuits while carrying out practical’s of soldering and electric principles and installed in un-electrified huts in Chikhalgaon (Dist.Ratnagiri)

v) Students of tribal residential schools of Dantewada (Chattisgarh) are regularly taking agricultural crop and supplies to their kitchen. They kept record of all the activities and studies growth of their crop from soil to harvesting as part of IBT curriculum.

It is observed that schools are providing community services of average value of Rs.26000/- pa. Technology based services taught and provided by IBT schools are shown in fig.2. All these services and technologies selected are based on the curricular areas like mathematics and science in the school.

<table>
<thead>
<tr>
<th>AGRICULTURE - ANIMAL HUSBANDRY</th>
<th>Mosquito control (Gippi Fish breeding), Making phenyl, liquid soap and selling Water testing Healthy diet, Soya milk, Blood testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drip irrigation, Sprinkler, Vermi composting, Vermi wash, Humidity chamber, AQUA Portal, Nursery technique, Azolla culture, Weather SMS, Seedling Tray, Vaccination Poultry, Age estimation, Rice cultivation, Crop using(SRI) Mulching, Silage Feed concentrate for animals Pest control, Soil testing</td>
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<td>Computer applications</td>
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<td>FOOD PROCESSING</td>
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<td>Solar drying, Food preservation, Drying of vegetables Medicinal plant cultivation</td>
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<td>ENERGY - ENVIRONMENT Electrical wiring, Solar cooker, LED lighting, Biogas, Soak pit, Watershed, Smokeless stove(Check dam construction), Earthing, Inverter, GPS</td>
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<tr>
<td>ENGINEERING</td>
<td></td>
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<td>Workshop technique, Ferro cement, Bamboo treatment, Different Agriculture tools Ventilation – Low cost housing, Sanitation - Toilets, Pedal power, Fabrication, Plumbing, Construction</td>
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Fig.2 Technology based services

Nurturing creativity
Community services gives students scope to try out alternate materials, designs etc. This leads to many interesting innovation from IBT students. Instead of carrying out activity for the sake of activity, absence of development in the community becomes the objective of student’s project. It is posed as research project and this gives scope to introduce
research methodology to students at school level. IBT students have developed many agricultural tools, food products, projects on introducing new technologies like azolla / irrigation technique in agriculture etc.

IBT schools won many awards in schools science competition, INSPIRE competition etc. Objective of the vocational program is not only to give skills but also to develop creativity, logical thinking and values like working in team and dignity for labour. IBT is multi-skill program and hence boys & girls have to work on jobs like welding, preparing food products, electrical wiring and helps in inculcating gender equality.

**Impact of the IBT program**

Impact of IBT was evaluated by many agencies. A latest independent third party evaluation was done in 2012 by Lend-a-hand-India\textsuperscript{[4]}. The major indicators of the success of IBT program as follows :

- 49% IBT Students (2011-12) enrolled for technical courses after Xth std. Which is higher than 16.81% all India enrollment rate and 20% enrollment in control group.
- 14% of IBT Girls enrolled for technical courses when national GER for girls in rural areas are 8.3%. For Boys 38% enrolled for technical courses when National GER is 13.7%
- 31% students who are not pursuing higher studies after 10\textsuperscript{th} std, Only 15% of them remain unemployed. Rest 85% are meaningfully employed/ self employed/engaged in agriculture.

Other Benefits recorded of IBT program is

1. Improving understanding in curricular areas.
2. Increase in enrollment & attendance.
3. Students get better idea of their preferences for future vocation.
4. School becomes happening place.
5. Decrease in drop-out rate (17%)
6. Wider exposure to student & improvement in their confidence level.

Success of IBT program encouraged many schools to come forward to adopt the program. Multiple funding partners supported the program in its scaling up. Today IBT is getting implemented in 122 schools with 7000 + students in Maharashtra, Chhattisgarh and Karnataka. Many agencies have started the program on their own and its very encouraging. In Maharashtra state, IBT has now become a part of core subject under new vocational scheme.

**Lesson learnt from successes of IBT**

When the old approach of vocational training in schools could not deliver the expected results, IBT program continues to grow and demonstrate its impact. IBT could generate public & community financial support for the program. This shows its acceptance and success. It is worthwhile to differentiate between the conventional approach of vocational training at secondary school and Vigyan Ashram’s approach in implementing IBT program(fig.3).
<table>
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<th>Conventional approach for vocational training in secondary schools</th>
<th>Vigyan Ashram approach in implementing IBT program</th>
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<tbody>
<tr>
<td>Content</td>
<td>Its trade based. Specific training is given in selected trade viz. mechanical, electrical, automobile, hospitality, security etc.</td>
<td>It is multi-skill program. Students get basic skills in all areas of nature.</td>
</tr>
<tr>
<td>Methodology</td>
<td>Theory + practicals. Most of the time importance is given to write answers and completing work book. Many assignments are paper-pencil based and soft skills exercises.</td>
<td>‘Learning while doing’ in real life situation. Students are implementing their skills by providing services. They learn about principles and practices on the job. There is no distinction between theory and practical.</td>
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<td>Updating the content</td>
<td>Took time to update.</td>
<td>Community services are the core of the program. This helps to keep program evolving with changing need of the community.</td>
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<td>Instructors</td>
<td>Mainly academically qualified teachers with salaries. May not have entrepreneurial ability. Most of the time, they are full time teachers.</td>
<td>Instructors are from the community and with demonstrable skills. They are entrepreneurs in the community. Since they are entrepreneurs, they are updated with needs of the market and latest practices. Effective in transferring entrepreneurship qualities to students at their level is possible.</td>
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<tr>
<td>Objective of the program</td>
<td>It is to introduce them to specific skill. Prepare them for career in a particular trade. Get the useful skills for employment if they dropped out.</td>
<td>To give them exposure to multiple skills to stimulate their intellect. Working by hands to develop motor skills, inculcate values like team work, dignity of labour etc. To understand connect between academics and the real life.</td>
</tr>
<tr>
<td>Objective of the program perceived by community &amp; teachers</td>
<td>To create skilled workforce.</td>
<td>To develop cognitive ability of child. To make them better human being. To introduce project based learning by involving students in real life problems and thereby practicing ‘constructivism’ as required by education policy.</td>
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<td>Cost of the program</td>
<td>Substantially high. It requires special tools and equipment. Chances of skills getting out dates are very high.</td>
<td>Required all generic tools. Skills based on local needs. Students ‘LEARN to LEARN’. Since they are learning multiple skills, they...</td>
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<td>On-the-Job Training (OJT)</td>
<td>OJT is compulsory part of the curriculum. Its difficult to</td>
<td>It encourages use of basic skills (plumbing, fabrication, electrical,</td>
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<td></td>
<td>implement considering practical limitation of school timing and</td>
<td>food processing, agri) in their surrounding. Schools itself have</td>
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<td></td>
<td>age of students. It becomes only exposure visits. In the rural</td>
<td>lots of work to do. Students brings work order from their home as</td>
</tr>
<tr>
<td></td>
<td>areas it is very difficult to organize OJT.</td>
<td>well. This proves to be more useful and exciting.</td>
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</table>

Fig. 3 Difference between conventional vocational education and IBT

**Gandhiji never wanted this !!**

Many advocates of vocational education in school give reference to Gandhiji’s thoughts on introducing crafts in education. Their intentions might be genuine. But Gandhiji in his philosophy of education wanted Crafts as a medium of education. He wanted work as medium of knowledge acquisition, values and also skills. He was not talking about vocational education but method of education by which brain will be educated through the hands.

Unfortunately, new scheme of introducing vocational education in secondary school does not seem to be based on these learning’s from the past. It is introducing trade/sector based learning at secondary schools. It will not be a surprise if the program fails to get enthusiastic response from students.

Government institutions are taking lots of efforts for effective implementation of scheme of vocational education at secondary schools. They are planning funding for training, training providers, development of quality content etc. But these efforts overlook the past learning from similar efforts.

**Study of contents of curriculum at IX and X std.**

A comparison was made to compare content of Level 1 and Level2 (IX and Xth std) curriculum[5]. It is observed that most of the content for basic level is generic in nature. For e.g measurement, safety, best work practices, communication skills, documentation etc remains the same across most of the syllabus. Fig.4 shows comparison different syllabus for L1.
Fig.4: L1 syllabus of different trades for L1

(FMPE/L1 : Farm machinery & power engineering, GHT : Green house technician, RE : Renewable energy, PFE : Processing and food engineering, SWC : Soil & water conservation, BT : Building Technology)

Fig.4 shows that across all the courses almost 80% syllabus is common. It consists of basic workshop practices, Engineering drawing, basics of physics etc. Only 20% syllabus is specific to that trade. But the content is generic in nature viz. food preservation, environment, painting etc. Therefore there is as such no big advantage in making the course sector based at basic L1 and L2 level. IBT program by Vigyan Ashram covers these common and generic skills. Therefore sector based approach can be easily avoided at L1 and L2.

Conclusion:

In the paper, the causes of failure of past efforts in introducing vocational education in schools were discussed. As an answer to this problem, pre-vocational program ‘Introduction to Basic Technology (IBT)’ has emerged as a successful alternative. The paper described difference between conventional thinking of implementing vocational education in schools and IBT’s approach.

IBT program shows, how multi-skill training and community services are successful strategies for introducing skills at secondary school level. On the job training (OJT) is
useful in an organized industry. It cannot be applicable for skills training for unorganized sector & rural areas. Community service becomes useful in place of OJT.

IBT stands for vocationalisation of school education and not merely vocational education. It is necessary to understand difference between the two terms as given in fig.5 :

<table>
<thead>
<tr>
<th>Vocational Education</th>
<th>Vocationalization of Education</th>
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</thead>
<tbody>
<tr>
<td>Training in particular skill</td>
<td>Training in all basic skills in variety of real life situation.</td>
</tr>
<tr>
<td>Objective to train in specific task.</td>
<td>Objective is to increase capacity of students to deal in variety of situations.</td>
</tr>
<tr>
<td>Specific skills may not help to face life-long competition.</td>
<td>It develops ability to learn and acquire varied skills.</td>
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**Fig.5 Difference between vocational and vocationalization of education**

It is heartening that focus is drawn on introducing vocationalisation at school level by Government of India. But all past mistakes must be avoided. Efforts must be made to carry out vocationalisation of secondary education and not introducing vocational education at secondary schools.

**References :**