

COMPETENCY - BASED CURRICULUM - THE PANACEA -

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ABSTRACT

With a result - demanding society, the industry has found out that the competency - based curriculum for their in house training, as an excellent strategy - the learning being always observable and measurable. If this approach is adopted by the technical education, the passouts of which are the direct inputs to the industry, the latter may co-operate much more as they will be the first to be benefited. They will get personnel with the requisite competencies who can be directly put on the job without any preliminary training. This will encourage an active partnership from the industry, right from the curriculum planning stage, also resulting in bringing about a lot of clarity in the instructional strategy and evaluation. This paper examines the concept of competency and argues the need for the technical education system to shift to the competency-based curriculum.

1.1 INTRODUCTION :

The concept of competency - based education and training is not a very new idea in India. It is gathering more momentum all over the world and even in the Indian Industry, because of the societal changes and market forces. Organizations like the Technical Teachers's Training Institute, Bhopal has conceived and implemented the Competency - Based Teacher Education (CBTE) programme for the polytechnic teachers of the Western Region of India, way back in 1976. Certain industries have been utilising this approach to train their craftsmen / craftswoman to master cer-

tain essential competencies, sometimes mentioned explicitly and at other times in implicit terms.

1.2 ORGANIZATION USING THE COMPETENCY APPROACH :

To get a fairer idea, let us examine a few competencies which have been used by a few organisations to attain their specific needs over the past years.

a. Technical Teacher's Training Institute (TTTI), Bhopal.

TTTI, Bhopal has been one of the pioneers in using this approach for training the teachers of the Western Region Polytechnics in India. A sum of

seventy-eight competencies (11) that are to be possessed by a technical teacher whose occupation/profession is teaching, were identified. Few of them are highlighted here.

- Conduct a group discussion
- Design laboratory experiences
- Design and prepare instructional materials (non-print)
- Use a case method for teaching

Of late, TTTI is even using the competency approach to train different clientele for the service and industrial sector too at all hierarchical levels.

b. Vocational Educational Schools in the USA

Andreyka (10) has listed a number of competencies required of an automotive mechanic, plumber, electrician etc. Some of them are :

- tune a carburetor to give maximum fuel efficiency
- fix a faucet without any leakage
- fix a plug - socket on a switch board for a 110 V ac supply.

You may notice in both the cases, each of the competency are observable and measurable.

c. Shipping Industry

The International Marine Organization (IMO) based at London has been using the competency approach for training the sailors. They have documented these competencies in 'The International Convention on Standards of Training, Certification and Watchkeeping for Seafarers (1978) as amended in 1995 (STCW Convention)' (6). Internationally, these competencies are made

mandatory. The trainees will not be given higher responsibilities on the sea, if they do not attain these competencies. Even their future career development depends on the attainment of competencies which they have to acquire from time - to - time during their career.

Some of the competencies of an electrical engineering diploma holder who is required to work on a ship are as follows (6) :

- i. *operate marine pumping system and associated control systems.*
- ii. *use English in written and oral form.*

Competency (i) further comprises of broad skill (as documented) like :

- a1. *operate routine pumping systems.*
- b1. *operate bilge, ballast and cargo pumping systems.*

Competency (ii) is made up of certain other kind of broad skills.

- a2. *English language publication are correctly interpreted.*
- b2. *Oral English communications are clear and understood.*

You will note that, the second comprises of intellectual skills and is not of practical skills as in the preceding one.

d. Vocational Education Systems in Australia

Presently, most of the technician, (vocational) education systems in Western Australia (4) is competency - based. The competency - based training in Western Australia has a very definite enterprise focus, with much scope for customisation. Industry has the power to define the training outcomes (competencies) that their particular workforce needs. The competency - based training

is used extensively in regional delivery via satellite linkups also.

With these examples in the background, let us now try to understand the term 'competency'.

1.3 THE COMPETENCY :

The industry/society wants competent people for all purposes. So, what does this word 'competent' mean? This means that the technologist, technician or craftsman (plumber, electrician) and for that matter any professional, should be able to perform his/her job proficiently. In other words, the person in any profession will have to undergo a purposeful learning experience to reach the proficiency standards required for the job.

'Learning' is described as a 'relatively permanent change' in behaviour in a learner, after he/she goes through a learning experience. If this being the truth, an explicit change in performance (behaviour) which is measurable and observable should have occurred after the learner has undergone precise learning experiences (if envisaged so) deliberately incorporated by the curriculum designer in a curriculum document.

Do the present day curriculum documents specially in technical education focus on a *changed behaviour*? Of course, in some cases it is implicit, but in most of the cases it is not. The concept of *competency* also relates to this. It focuses on a behavioural change which should be reflected deliberately and purposefully in a curriculum document. In short, competency-based education is a system of training whose learning modules and methods of assessment are

based around the attainment of well defined, and agreed upon, group of competencies. The attainment and assessment of competencies has benchmarked (4) against specified standard (usually in consultation with the industry) and not against other learners.

A seminal work on competencies was produced in 1982 by a US academic, Richard Boyatzis (9). His definition of competency as an underlying characteristic of a person was very broad; it could be motive, trait, skill, aspect of one's self-image, or social role or a body of knowledge which he or she uses. Where Boyatzis made an important contribution was in distinguishing between, function, tasks and the relevant competencies needed to undertake the task and hence fulfill the requirements of the function.

Rhinesmith (8) has defined that a competency is a specific capacity to execute action at skill level i.e. sufficient for achieving a desired effect.

With all these discussion in the back of your mind, we shall try to define what a competency is. You may also come across several other definitions of the word 'competency'. A working definition which we are elaborating here will be the basis of our discussion in this paper. '*A competency is a cluster of skills, knowledge and attitudes required of a person to perform a specific job with a specified proficiency*'.

This definition then implies the following :

- that a competency is an integration of knowledge, skills and attitudes
- an observable and measurable demonstration of the skills is essen-

tial for the accomplishment of the competency

- 'action' or 'performance' oriented verbs have to be used in stating competencies
- a job is a complete unit of work that results in a product or a service for which the employer or customer / client is willing to pay
- it involves higher order knowledge, skills and attitudes involved in designing, interpreting, evaluating, analyzing, creating, planning, troubleshooting, diagnosing etc. as well as relatively simpler ones as cutting, joining machining, measuring, soldering, painting etc.
- it involves knowledge, skills and attitudes that vary from being specific to generic and from being essentials to only elective ones
- perform a job at a specified proficiency means, performing a given job successfully every time he/she is asked to do. In other words, mastery at the job is the key.

1.4 SALIENT FEATURES OF THE COMPETENCY APPROACH :

The salient features of a competency based curriculum, especially concerned with technical education in particular is that :

- it shifts the emphasis from cognition to performance
- the process of learning is individualized
- the course content is identified more systematically
- students are evaluated more objectively

- there is an increase in congruity between objectives and tests
- evaluation is not by Norm - referenced testing, but by Criterion referenced testing
- instruction can be modular which can offer different learning alternatives to attain the competency
- It makes the attainment (2) of the competency constant (or definite), and the time required to attain the competency is variable, (in the present system time is constant and learning is variable)
- it facilitates the development and evaluation of accomplishment of competency by the student himself/herself
- emphasis is placed on accountability. Exit performance will come up to specific standards, while the flexibility will be permissible at the entrance and during learning phase
- competencies like leadership team work, assertiveness, will be developed in group situations during the contact sessions (1)
- locates the industry as a central customer
- modular design is possible more easily, rendering the curriculum more portable for a flexible programme design and flexible delivery
- open entry and open exit can be built in
- credit is granted for work completed
- certification is made simpler, depending on the attainment of com-

petencies

- allows customisation of training for client groups and
- offers opportunity for workplace reforms.

1.5 NEED FOR COMPETENCY APPROACH :

Three key issues (3) are driving change and affecting organisations in India and the world.

- Technological change
- Globalisation and
- Customisation

The technological change has altered concepts of space and time and has made enormous impact in the way society and work is organised. With E-Mail, Internet and World-Wide Web, information and knowledge is on the tap for every one. If organisations have to survive in an environment of competition, new technologies and training techniques are to be adopted/ adapted. Globalisation has created a much more accessible world through transportation, deregulation and electronics communication, resulting in increased competitive pressures.

Customisation has made organization to move away from internal concentration on their product to an external concentration on responding to customer's needs. For example, we no longer tend to teach people, but we help and facilitate the learning process in programmes, often largely designed by the customer.

As a result of these key drivers of change, three processes are emerging in our organizations and in our patterns of

work (3).

• Boundaries are changing and are becoming more permeable :

- public sector is moving to the private sector model.
- amalgamations/takeovers are happening to create increased effectiveness
- strategic alliances are being struck with organisation for increased effectiveness
- there are more interstate and overseas activities in both public and private organisations.
- our own internal boundaries are changing as we re-structure to meet the new environment.

• Time frames for action are being reduced :

- we must be fast to be competitive
- we are expected to do more at a higher standard and that too with fewer employees.
- we have to work both harder and wiser to survive.

• Our work is becoming internationalised

- internationalization poses a less predictable environment
- organisational learning is essential for doing business with other cultures
- competition is worldwide with programmes/courses available on the Internet
- age and cultural differences are disappearing as young people across the world adopt new technology with ease
- our work is now open to

instantaneous worldwide critique emphasizing world's best practice.

The Australian experience (4) shows that, when a curriculum is developed with competency-based design, the industry becomes a major stakeholder, because it is in their partnership, that the competencies are decided. As a consequence, for the highly expensive technical education, the industry will also provide the necessary funds, to a certain extent.

For the students this approach is highly self-motivating, as almost all the students work toward 80 to 90 plus scores on all their skills, as the criteria for assessment is already made known to them. The only limiting factor (if it is) is the time which can be overcome, if the curriculum delivery is made flexible if alternative instructional strategies are provided.

The strength of this approach is also its effectiveness as a teaching tool. Students can use the score sheets to critique their own work before asking their teacher for a score.

Most of the times, the industry thinks in terms of the competencies which a person should possess, to perform the job rather than skills at a macro level (5).

1.6 BENEFICIARIES

Looking at the examples in section 1.2 and with the discussions so far, it is now obvious to you that stating the competencies explicitly brings about a lot of clarity to all those who are concerned about education and training. You can also see that the beneficiaries are many.

* The student/trainee is the first

and foremost beneficiary, who has to demonstrate the competency.

- It is known from the start what competencies he/she must attain to complete a programme of study successfully.
- The student knows right at the beginning of the programme/course, how well he/she must perform on all written tests and all performance tests to attain the required competency (s).
- The student can see exactly, how the evaluation will take place.
- The progress or performance of one student is not compared to that of the other students. It is with reference to fixed standards, or in other words, to a acceptable level of performance (criterion-referenced tests).
- If a student has already acquired certain skills required for a particular programme (as in Multi-Point Entry and Credit System) and demonstrates the relevant skills, attention can be focused on skills that have not yet been acquired.
- The student is able (without penalty) to go back to the learning resources several times, if need be, to attempt proficiency.
- Enough time (within reason) can be spent to practice the skill to reach proficiency levels.
- On the acquisition of the skills, the student may speed up the progress through the programme.
- A particular programme can be completed when the student has attained all the stipulated competencies and hence the exit need not be

restricted to any date. This will make it convenient for the student to time the landing at a particular place or job within his/her control.

- The teacher/trainer/instructor gets a clear idea of the instructional strategies that he/she will need to adopt, the instructional resources to be kept ready, the instructional media to be developed/procured for the development of the competencies.
- Helps the administration /organizations for arranging requisite resources.
- Guides the instructional system designer in deciding the kind of instructional resources that are to be provided and in what logical sequence.
- Informs the evaluator/examiner the type of assessment tools he has to adopt to test the accomplishment of the competencies and the skill / enabling objective.
- The industry / society becomes aware of the competencies that the passouts possess emerging from a particular programme. They can also give feed back of the competencies that need to be included and that need to be taken out.

If viewed wholistically, we see that the competency -based curriculum specially for technical education is a very effective approach to achieve the overall aims of any programme whether short-term or long-term.

1.7 INSTRUCTIONAL STRATEGY :

When performance becomes the criteria, as is required in a competency -

based curriculum, the usual classroom instructional strategies adopted hitherto will have to be modified and re-oriented towards demonstration of the specified skills. The overall learning experiences planned by the teacher/trainer should be directed towards the acquisition of the stipulated skills and thereby attain the competencies.

To develop any skill, be it intellectual (cognitive) or a practical (psychomotor) the instructional strategy would be firstly, to present the requisite stimulus material - maybe through a handout, lecture, demonstration, video and the like. Following this, opportunity should be provided to the student for practicing the skill (by way of mental activity) group activity or some practical exercise) with close supervision by the teacher/instructor/trainer. Immediate feedback (for immediate knowledge of results) need to be given for improvement or correction so that the skill can be mastered. In other words, for developing a skill, the instructional strategy should be **Input - Practice (process) - Output - Feedback** cycle as depicted in fig. 1. Enough opportunity should be made available for drill and practice which will accelerate the acquisition of atleast the essential skills which are crucial for the competency development.

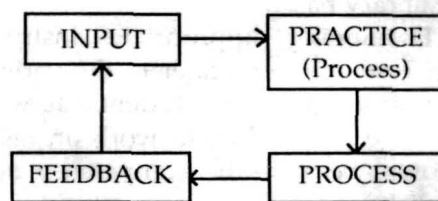


Fig. No. 1 : Skill Development Cycle

1.8 INSTRUCTIONAL RESOURCES :

The instructional resources generally available in the market caters to more than one category of target group. Every group has to strain out what it requires from the common mass of knowledge and leave the rest. For example, a diploma engineering student may study from the same text book/ laboratory manual that is used by the degree student. Moreover, the emphasis of most of the resources is on cognition and not performance, thus not making it much suitable for developing skill.

In a competency - based curriculum, where an overt performance is required, it intrinsically demands competency specific instructional resources. Hence, the instructional resources should enable the student in performing the skill and not lead towards rote-learning. Therefore course - specific and skill - specific learning material need to be produced.

The instructional resources need to be learner friendly, and should have enough of examples and counter-examples for as many concepts, principles and applications as possible. Assignment and feedback will also have to be inbuilt. The assignments could have activities which may be pen and paper - based, field-based, laboratory-based and / or library-based.

Developing appropriate instructional resources, can cater to the varied learning styles of the students. It will encourage the student to work on his/her own, because the competency accomplishment provides an intrinsic motivation. This will lead to more discipline in the individual student in - turn

the whole educational environment.

1.9 ACCREDITATION :

Accreditation of any educational / training programme is a necessity to draw the relevant clientele. A unified system of accreditation of the competency standard, recognition of prior learning (prerequisites) will go a long way for all the stakeholders concerned, especially in the internationalisation of the competency-based curricula. For this to happen, a clearinghouse (a recognised body may be like the All India Council for Technical Education) should start functioning at the regional and national level. Such a body can even function at the institutional level as far as autonomous institutions are concerned. This clearinghouse will have representatives from the industry, institutions, government etc. and they will decide the competency and will be responsible for some of the following function :

- competency standards development
- curriculum and learning resource development
- delivery of education and trainee
- quality assurance

1.10 THE FUTURE :

The emphasis so far in most of the curriculum designs in the technical education system is in acquiring knowledge and not on developing the requisite competencies required for lateral and vertical career mobility. The concept of competency - based curriculum will trigger a new system of education and training and give a new direction to the development of the curricula. This ap-

proach for the technical education system will become compatible for the industry and country.

A competency - based curriculum, is inherently modular in nature, which can make the delivery very flexible, and also convenient to be offered even in the distance mode interspersed by contact hours. Along the way, working professionals will also be helped if the delivery is made flexible.

1.11 REFERENCES

1. **Mani, R. K. & et al** - Training Needs and Instructional Objectives; Module for RTC staff under Cement Industry HRD Project; Pub. TTTI, Bhopal, (1996).
2. **Patki, S. D.** - Methods to Update Curricula - Monograph presented at Educational Technology Course at I.I.T. Delhi; (1996).
3. **Wild, Dr. Ron** - Internationalisation in VET; Paper presented at the Australia, India New Horizons in Education and Training conference at New Delhi, Oct. 1996.
4. **Hill, Ian** - Issues and Outcomes of Vet Reforms : Competency Based Training - Paper presented at the Australia, India New Horizons in Education and Training conference at New Delhi, Oct. 1996.
5. **Ernest, Joshua** - Curriculum Development in emerging technologies; The Journal of Technical Education; Pub. ISTE, New Delhi - (1996) pp 33-36.
6. **I.M.O.** - International Convention on Standards of Training, Certification and Watch keeping for Seafarers, 1978, as amended in 1995 (STCW Convention) and Seafarer's Training, Certification Watch-keeping Code (STCW Code), International Maritime Organisation (IMO) : London (1996).
7. **Mani, R. K.** - Curriculum Design and Development; Monograph; Pub. TTTI, Bhopal; (1995).
8. **Rhinesmith - Frantzeb, Richard B** : Editor; Training and Development YearBook; Prentice Hall : New Jersey; (1994) pp. 7.55.
9. **Boyatzis, R. E.** - The competent Manager : A model for Effective Programme; New York; Wiley (1982).
10. **Andreyka, E** - Establishing CBVE demonstration Centre : Final Report; Ridge Voc. Tech. Centre; Winter Haven, Florida, ERIC Microfiche No. ED 210 422 (July 1980) pp. 216.
11. **TTTI** - Modular Approach in Technical Teacher Training : Competency - based Teacher Education; Paper presented at Third Inter TTTI Faculty Conference, Chandigarh TTTI; Pub. CDC, Bhopal.

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