programmes of awareness training for building up women's confidence and making them economically self-reliant. Such programmes would help them stand on their own feet and decrease their dependency on their husbands or parents for their financial sustenance. The laws protecting the rights of women, like the anti-dowry legislation, should be effectively enforced. Such a step can considerably reduce the occurrence of domestic violence.

Knowledge of women about laws related to atrocities against women and services addressing women's issues are in general scanty. Awareness campaigns, workshops, seminars etc. in this regard should therefore be organised regularly in rural as well as urban areas. A fundamental change in the attitude of the general public and in particular men is required to enable women to live in the society and at home as free human beings with due respect and without the fear of being subjected to violence. Gradually women must be made capable of organising themselves in order to raise collective voice against violence on them. Unified efforts can certainly create public opinion against situations, where women are subjected to all forms of atrocities. Women must help themselves collectively in the fight against violence.

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A CENTRE CARING FOR THE DEVELOPMENT OF RURAL TECHNOLOGY: IRTC

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INTRODUCTION

Integrated Rural Technology Centre (IRTC) has been in existence since 1987 with the mission of integrating rural technology with scientific knowledge and scientific temper, and disseminating them to the rural people so as to enhance the quality of their life. IRTC has its roots in the Kerala Sastra Sahthya Parishad (KSSP), the premier People's Science Movement in the country, started in 1962 as a forum for the science writers in Malayalam (regional language of the state of Kerala). Through the years the KSSP has emerged from an idea of a group of committed individuals, to a well-knit organisation spread all over Kerala and finally to a People's Science Movement. It has grown from the humble objective of publishing articles/ books in Malayalam on science, scientific inventions and discoveries for enabling the common literate Malayali to understand the progress of science and its importance in our day-to-day life. Its goal got evolved later into the slogan "Science for Social Revolution", by virtue of its empirical knowledge and experience accumulated through the years of active involvement in several real issues.

On de-constructing this slogan, one can arrive at the following components or action plans condensed therein.

1. Popularise scientific knowledge and scientific temper among the common people in the country, which will serve as weapons in their hands and help them in their collective struggle for climbing up from the abyss of illiteracy, poverty, exploitation, inequality, superstitions, communal factionalism etc., in which a majority of them are lying plunged deeply.
2. Expose and oppose all that is unscientific and anti-people in the policies, approaches, attitudes and applications in the society, particularly at the state level.
3. Carry out activities of research and development (R and D) in order to evolve alternate approaches in the field of science and technology that will be beneficial to the masses and thereby to achieve sustainable development of the country.

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It was in summation of these objectives that the KSSP coined the slogan, "Science for Social Revolution." In an attempt to materialise the third component of the same the KSSP gave shape to the IRTC in 1987. It coincided with the initiative of the Department of Science and Technology (DST), Government of India to provide core support grant to set up such a centre under the STARD (Science and Technology Application for Rural Development) Programme of their Science and Society Division. Later in 1995 the IRTC was registered as an autonomous institution.

The objectives of the IRTC are the following:

- Adapt technologies known elsewhere into forms appropriate to our society.
- Diffuse innovative practices of technologies and scientific culture among the masses in a big way.
- Work out local level development plans.
- Take new technologies out of our R and D institutions for field trials.
- Identify and promote local inventiveness.
- Develop integrated 'science and technology' packages and management models for strengthening local economies.
- Encourage young scientists, research scholars, students and rural innovators to work for rural development.

All the IRTC programmes are targeted to the disadvantaged

sections like women, scheduled castes and scheduled tribes. Most of the participants of the training programmes conducted by IRTC come from these categories.

ACTIVITIES

IRTC gradually started taking up projects related to various problems coming under areas such as energy, environment, water and soil management, agriculture and fisheries, pottery, local level planning, health and sanitation, education, gender issue, rural technology and engineering, rabbit rearing, etc.

Energy

In the field of rural energy the *Parishad Aduppu* (oven) or smokeless *chulha* (oven) was developed by IRTC in the 1980s. This smokeless *chulha* has fuel efficiency three times more than that of the conventional wood burning oven used traditionally. It reduces indoor pollution in the kitchen and helps improve cleanliness and hence it safeguards the health of the user. Fuel efficiency of this *chulah* reduces the consumption of firewood by one third and thereby saves cutting of trees to that extent. Through the Agency for Non-conventional Energy and Rural Technology (ANERT), the Government of Kerala distributed this *chulah* to thousands of houses in Kerala, and thus it became very popular.

Another activity of IRTC in the field of energy was the development of an electronic ballast, meeting Bureau of Indian Standards (BIS) specifications, for tube lights and compact fluorescent lamps (CFL), in order to reduce power consumption. Its production and marketing were undertaken at IRTC. However, market competition forced IRTC to stop the production of this energy saving device. Presently a full-fledged laboratory for testing quality attributes of CFL is functional at IRTC, which has been approved by the Kerala State Planning Board.

A device, called 'hot box', was developed by IRTC with the use of thermocol for saving fuel in cooking rice. In using this device, the

vessel containing partially cooked rice is transferred in the boiling condition and kept inside the hot box and closed. This is an improved version of *kachipetty* (a wooden or a cardboard box in which paddy straw – *kachi* – is spread tightly leaving a whole at the centre within which the cooking hot pot is kept with a lid and a paddy straw pillow is placed on the lid and the box closed). Keeping the same in that condition for about two hours the rice gets cooked. About 50 per cent saving in fuel (or fire wood) is effected when the hot box is used.

The performance analysis of a 5 KVA bio-mass gas producer, supplied by the Indian Institute of Science (IISc), Bangalore, was successfully conducted by IRTC using coconut fronds. The gas produced in this manner can be used in domestic gas burners for the purpose of cooking. It can also be used in a diesel power generator to produce electricity. It would be possible to supply gas for cooking and electricity for household lighting, in return for the biomass used, in areas where access to electrical grid is a problem.

Selected sites in the Western Ghats were assessed for their potential for economical generation of hydro power. Detailed project reports for all the sites were prepared and a methodology for cost reduction through the standardisation of unit sizes was also suggested. A micro hydro station using pump as turbine at Kavarakundu, Malampuzha in Palakkad district of Kerala was proposed. Also an induction motor was selected for use as generator. Using a load controller, developed at the Indian Institute of Technology (IIT), Delhi it would be possible to generate electricity with better efficiency and economy in micro hydro stations. Though the system would work as shown by the results of tests under lab conditions, the project is yet to be field tested.

Another activity of IRTC in the field of energy has been the power line mapping and assessment of the efficiency of rural electricity distribution system that was carried out in a few panchayaths in Kerala. It was possible to suggest changes such as re-location of transformers, conversion from single to three phases, etc. for reducing loss in distribution, improving power supply and helping economical utilisation of electricity.

Agriculture

IRTC has been making experiments in the area of agriculture in order to introduce new enterprises and improve production. One of the experiments taken up by the centre was in sericulture. Sericulture was attempted at the IRTC campus in Palakkad district during 1992-93. Farmers were trained in rearing of silk worms for silk production. Assessment of the quality of cocoons produced in the experimental endeavour indicated that climatic conditions of Palakkad were not favourable for production of good quality silk. Thus no step was taken to promote sericulture.

A new rubber tapping technique, inclined upward tapping (IUT) was introduced and tested for getting increased latex yield. IUT is a method of tapping in the upward direction on inclined panel, while the traditional method is exactly in the opposite direction, downward in a vertical direction. Up to 45 per cent increase in latex yield was reported. This was field tested successfully. Also this method was found useful in controlling the Brown Bast incidence due to tapping.

Another activity initiated by IRTC has been fish farming. A programme for training farmers in scientific fish farming and spawn rearing was started at IRTC. A Chinese hatchery was set up and farmers were given training in spawn production. As part of this programme aquaculture service support system was developed during 1999-2003 through farmers' co-operative societies in two panchayaths, Puthuppariyaram and Polpully in Palakkad district. This facility is being used to breed edible fish and distribute fish fingerlings to farmers during every monsoon season.

Mushroom cultivation is another agricultural activity undertaken by IRTC. Facilities for production and cultivation of oyster mushroom spawn were set up in the campus of IRTC as a continuation of a DST (government of India) project. As part of the programme mushroom spawn is distributed to farmers and they are given training in mushroom cultivation. Over the years the IRTC experiment has shown that small scale oyster mushroom cultivation is an economically viable income generating household activity.

Environment

One of the activities taken up by IRTC in the field of environment is soil conservation. Agro forestry alternatives for soil conservation were investigated and experimented during 1988-1991 in three districts of Kerala, viz., Ernakulam, Thrissur and Idukki, which correspond to gentle, medium and steep slope lands. As a result, certain types of vegetation like pineapple were found to be effective barriers in preventing or reducing soil erosion. A farm refined technique, namely vegetation guarded trenches and ridges (VGCTR), was found to be most effective. The method is based on the formation of vegetative barriers which are capable of bringing down the soil erosion effectively. The pineapple hedge was the most efficient with 95 per cent reduction, followed by vetiver and fodder grass hedges. VGCTR in conjunction with ridge farming and cow-pea cover was the most effective in bringing down soil erosion.

Preservation of biodiversity has been an environmental concern of IRTC. An assessment of biodiversity was conducted in the Meenvallom area of the Western Ghats during 1994-1996 through field mapping, random sampling of flora and fauna and interviews with the local people. The investigation confirmed reckless exploitation or destruction of forest areas. In the less disturbed areas a number of endemic and rare species of flora and fauna are still present. Mono culture in human habited areas is threatening biodiversity.

An eco-restoration plan for Attappady (Wayanad district) was prepared on the basis of an extensive field survey using local volunteers. As a result of the study, micro level action plans were made for agriculture, agro forestry and animal husbandry in conformity with eco-restoration and sustainable land use.

Another area of IRTC's environmental concern has been management of solid waste. Appropriate processing of municipal solid wastes, with the objective of avoiding environmental pollution and manufacturing compost useful as organic manure for agricultural purposes, has been extensively studied by IRTC. Detailed report of the study has been given to many panchayaths and municipalities in the state on how to manage and market household waste. A system of aerobic

windrow composting installed at Chalakudy (Thrissur district) was operated for one year by IRTC and transferred to the municipality. In windrow composting waste is spread on hard surface and partially diluted raw cow dung is sprayed over that. Then another layer of waste and cow dung is sprayed over it. Such layers are prepared, one over the other, in the form of a windrow up to a height of about one meter. Then the windrow is covered with a silpaulin sheet. After ten days the sheet is removed and the waste is mixed thoroughly. Again it is covered with the sheet. This is repeated every tenth day. By the sixtieth day the waste becomes compost. At present IRTC is helping the Palakkad municipality in developing the facility for managing the solid waste through aerobic windrow composting. Several other municipalities and panchayaths in Kerala have approached IRTC for consultancy in solid waste management. A handbook on appropriate methods for solid waste management has been prepared by IRTC.

A problem of waste disposal and serious health hazard in water logged areas is the faecal contamination of surface and ground water. In an attempt to deal with it a new closet for dry compost latrine with facility for diverting urine and wash water to facilitate dry composting of human excreta was designed and developed at IRTC. This has been field tested in Kumarakom, Kottayam district during 2000-2003 and was found to be effective in totally preventing contamination of ground water.

Land and Water Management

In 27 panchayaths identified in different districts of Kerala, an integrated resource survey and a map preparation were carried out with the active participation of volunteers, earth scientists and panchayath functionaries. *Kalajathas* (marches with performing art forms), meetings, door to door visits for field work and ward-wise meetings were held to discuss details of land and water resources. A handbook on how to conduct participatory resource mapping was also prepared by IRTC**.**

The development plan for any panchayath needs to be based on the status of the watersheds in the panchayath. The development plan for primary sector, like agriculture production and animal husbandry,

needs to take into account the land and water resources. In a project, funded by the District Rural Development Agency (DRDA) during 1998-2000, development master plans were prepared for micro watersheds in the Mundur, Pudupparirayam and Akethathara panchayaths in Palakkad district. Subsequently, recognising the utility of such master plans for their five year plan proposals, many block and grama panchayaths approached IRTC for assistance. So far IRTC has helped eight block and four grama panchayaths in the preparation of master plans based on watersheds with people's participation.

As part of the water management programme, a subsurface check dam using impervious bentonite (clay) was constructed across Bharathapuzha river at Thrangali, Palakkad by the panchayath. Under the supervision of IRTC, hydrological data of the nearby wells were collected, socio economic survey was conducted and a resource map of the project area was prepared. The failure of the dike due to damage to a vital portion of the structure prevented completion of the studies by IRTC on the influence of subsurface dam on ground water table in order to understand river water management issues and help resolution of conflict between up and down stream riparian communities. The study will be pursued when a suitable check dam is available for it.

Technology for Rural Pottery

Under the initiative of IRTC some attempts were made to improve the rural artisans of pottery. As an initial step, a survey of the socio economic conditions of the potter community was undertaken during 1999-2000. The survey, which covered 2483 households engaged in pottery work spread over 199 panchayaths, indicated a declining trend in the demand for the traditional pottery products (plates and pots). It was observed that use of pugged clay and motorised wheel, product diversification, value addition through decorative work like 'decoupage'(a French technique through which a pot is decorated by painting after pasting a photograph) and above all sustainable marketing practices were needed to improve the socio economic status of potters. Model project proposals on this matter, given to grama panchayaths, have been included in their annual plans for the uplift of the potter artisans.

Some programmes of value addition to pottery products have been initiated by IRTC. A pug mill was installed at IRTC in order to supply pugged clay to potters. Fabrication of motorised potter's wheel has been taken up by IRTC and the wheels are supplied on demand. Training in the operation of motorised wheel is given to the needy. Training in studio pottery is imparted with the help of the Design Centre at Bangalore. Periodical training in decoupage is also given by IRTC to every interested person or group.

Rural Artisans

A directory of keracraft workers (artisans working with coconut shells), providing information on the coconut shell products and tools, and institutions working for development of coconut shell based artefacts, was prepared in 2000-2001. An association of artisans also was formed. Need for developing machineries and techniques to make value added products and to reduce drudgery of artisans are being addressed to.

A micro enterprise for forest products that do not use wood was initiated by IRTC during 2002. This project for non-wood forest products to generate income for the forest dweller is found feasible in Peechi-Vazhani wild life sanctuary in Thrissur district. Herbs and shrubs are potential products for further value addition before marketing. About 109 forest products were prepared under the project. A society was formed for extracting essence from plants and also for cultivation of the most wanted species of plants.

Production of Household Goods

IRTC has developed technologies for hand-used production of toilet and washing soaps, detergent powder and liquid blue. A mould has been designed and fabricated here for making hand made soaps. Two subsidiary units, viz., 'Samatha Production Centre' for making hand made soaps and other products, and 'Parishad Production Centre' for marketing the products, have been set up by IRTC. The centre extends training to entrepreneurs and other interested groups in the above livelihood activities. It also extends support to the trainees by providing soap and detergent kits, containing all necessary ingredients for making soaps at home. The mould is also made available.

Education

Education is another field in which IRTC could do something different. It has taken steps to make pre-school education more scientific and child friendly. In order to achieve it, activities in pre-schools need to be based on modules where learning strategies can be implemented by teachers and parents. A handbook for pre-school teachers has been prepared by IRTC during 2000-2003. Also learning problems in children were studied. It was shown that the problems encountered could be remedied through parental and teacher education, once awareness is created and appropriate approach in ensured.

Another activity in the field of education was in teaching English. On the basis of integrated cognitive approaches a module was developed by IRTC during 2000-2002 for helping school children learn English. In connection with it, two day children's language camps were conducted in eight centres in Vellanad and Nedumangad panchayaths wherein 225 teachers and 450 students participated.

A study was conducted by IRTC in 2002-2003 in order to find out the extent of wastage and stagnation in engineering education. The study covered three engineering colleges in Kerala - one each run by the government, by private agency with government aid and by private agency without government aid. It was found that many students (15% of total admissions) had several papers yet to be cleared when they completed the four year course. Most of these students secured admission under the various quotas, such as management, scheduled caste and scheduled tribe. About 10 per cent of the students did not even complete the course. This problem of stagnation and wastage in engineering education was traced to admitting students who had no aptitude for engineering or lacked proficiency in Mathematics, but were forced into the engineering course through pressure or parental compulsion. Ameliorative action was suggested in order to deal with the issue.

Science Awareness

A campaign for awareness on science was organised during 2004-2005 through a series of science lectures to school and college students and to the general public in three districts, Malappuram,

Palakkad and Thrissur. An expert team trained the resource persons who subsequently handled the awareness classes. In addition, demonstration on water quality, handmade soap making, mushroom farming, vermi composting and rainwater harvesting were arranged at IRTC premises. These were attended by groups of school children, women and farmers.

Students of selected schools were encouraged to form a theatre troupe of 10-12 members under a teacher of the school. Scripts for the play were prepared and finalised in a workshop at Thrissur. A five day rehearsal camp was held at IRTC, wherein two students and two teachers from each district participated. This was followed by school level rehearsal camps at every district, wherein a troupe of 10-14 students was trained. In each district this troupe made ten performances within 25 km. radius of the host school. In addition, articles on science written in Malayalam were published in a book entitled 'Science and Scientific Awareness'.

Gender Issue

Women's development has been another area in which IRTC has been involved. A preliminary study was made on the role of women in the freedom movement. Women freedom fighters of north Kerala were interviewed to produce a document on their role in freedom movement.

A study of the *pokkali krishi* with reference to its impact on women was conducted. *Pokkali krishi* is a method of organic agriculture in wetlands, wherein both rice and shrimp are grown in eco-friendly agriculture. The objective of the study was to find out whether shifting from this to only shrimp growing would adversely affect the economy of farm women. The study indicated that women were not seriously affected by the proposed change in cultivation, because they are employed for export oriented shrimp pealing. However, male labourers who do not get year round employment get affected in the change to fish cultivation alone. Hence, ecological sustainability in *pokkali* fields is possible only through rice/fish cultivation schedule.

In the area of women's health, training modules for building

capacities of women groups on women's health were prepared. Training and awareness programmes on women's health were conducted at the state, district and village levels during 1999-2002. A handbook has been prepared on health and women empowerment.

A gender profile of Kerala was prepared during 2002–2003. An important item of information contained in the profile is that gender disparity is less in most of the human development indices like education, life expectancy etc. However, the work participation ratio was low among women in Kerala. Another piece of data from this profile is that crime against women has increased in last decade.

Cost Effective Construction Techniques

IRTC made some efforts in the field of cost effective civil construction. With a starting core grant from the DST (government of India) in the late eighties (1987-1989) a number of training programmes were conducted for engineers, technicians and masons on various low-cost construction techniques. With the grants from the Science, Technology and Environmental Council (STEC), government of Kerala in the year 1991, masons were given training in cost effective methods of building construction with Ferro-cement slabs, rat-trap bonding, filler slab roofing, arches, brick *jally*, corbelling, pre-casting of hand rails etc.

Local Level Planning Experiments

The attempt to prepare long-term developmental action plan for resource based sustainable development with people's participation in Kalliassery panchayth, Kannur district, was a unique one. As the first step, a *mahajana sabha* (people's meeting) was formed with one member nominated by consensus for every 25 households in each ward. The *mahajana sabha* then, by a process of election, formed the panchayath *vikasana samithi* (development committee)**.** Around 1200 volunteers from the village and 20 specialists from outside were involved in collecting data on natural and human resource status of the village. They held discussions at various levels and drew up an integrated village development plan.

Formation of micro level institutions, as part of panchayath level development planning, was another experiment in local level planning. In order to strengthen people's participation, micro level institutions were formed during 1996-1998 in five panchayaths, viz. Mayyil (Kannur), Ochiyam (Kozhikode), Madakkathara (Thrissur), Kumarakom (Kottayam) and Mezhuveli (Pathanamathitta). The micro level institutions were (1) panchayath development societies (PDSs), (2) ward development committees (WDCs), (3) neighbourhood groups (NHGs) for every 25-50 households, (4) sub-committees at all the above three levels and (5) self-help groups for women. Technical support groups (TSGs) consisting of 30-40 local activists who have technical and organisational skills in managing participatory action plans were also formed. A system was developed for data gathering and processing with maximum people's participation. Reports on natural resources, socio economic status, education, health, etc. were compiled.

In the second phase of the project specific areas were identified for human capability development. These were land and water management, education, health, documentation, organisation of building structures, preparation of perspective plan etc. Formation of NHGs and TSGs had significant impact on this programme. State level and panchayath level training demonstrated that participation of people (both men and women) was meaningful and effective. This facilitated the preparation of the handbook by the state planning board for the programme of people planning campaign. Data on natural resources (up-gradation and simplification of thematic maps) and social resources (land, irrigation, energy, education, health, economy etc.) were compiled into reports that became handy for preparing the master plan for panchayath development. IRTC believes that collective dreaming of common people must lead to development plan to create sustainable, productive employment based on natural and human resources. The survival and effective functioning of the NHGs, PDSs, TSGs and women's core groups (WCGs) will be the key to participatory local development programmes.

Several studies were undertaken by IRTC in the broad area of development planning. One such study was conducted by the IRTC during1998-2000 in order to analyse the changing trend in urban ecology of Thiruvanathapuram city during the last century. The results of the study showed that, after the city was retained as the capital of the Kerala

state, the land use pattern became highly oriented towards residential use. The heavy migration and increase in population resulted in encroachment of natural areas and this ultimately led to other problems like urban flood. A critical evaluation of various developmental activities in Attappady was done in 1998 and suggestions for improvement were given to the Attapady Hill Area Development Society. In another study undertaken by IRTC, the possibilities of evolving a locally appropriate and integrated credit plan for banks in Akathethara panchyath in Palakkad district were analysed and a method for the integration of credit plan with the panchayath development plan was proposed. A similar study on the banking sector (1999-2001) showed that the service area approach failed to produce any positive result in credit utilisation and it has the inherent limitation in procedure and implementation. The IRTC study on the impact of democratic decentralisation and people's plan campaign on the Integrated Child Development Service (ICDS) has indicated a positive impact of the involvement of local self-government institutions (LSGIs) in the management of Ankanawadis in Kerala.

Health

The study of the health status in rural Kerala, conducted by IRTC during 1990-1991, showed that Kerala has made remarkable advances in basic indices of health status, like low birth and death rates, low infant mortality, lower rate of disability, better female sex ratio and higher female life expectancy, and the gap between rural and urban population in the matter of health status was reduced, despite comparatively low economic development. A comparative study of the ICDS and non-ICDS blocks in Kerala showed that investment in special programmes like ICDS seems to bring in only marginal returns in the areas of immunisation, and that justification for such investments demands better impact.

An investigation into the sickle cell disease among the tribals of Attapady (Wayanad district), conducted during 2002-2004, showed its high prevalence among all the tribal communities here (565 patients during the period) and low incidence of other diseases (hemoglobinopathy or thalassaemia). The study also shows that sickle cell anaemia in Attapady is relatively mild, compared to that seen in

Africa, and the survival rate of sickle cell anaemia patients is higher in Kerala than in any other place in India.

Training Programmes

Over the years, IRTC has conducted a number of training programmes in several areas. They include installation of smokeless *chulhas*, making of pottery liners for smokeless *chulhas*, assembling of electronic ballast, low-cost construction techniques, rabbit rearing, mushroom cultivation, agricultural nursery practices, sericulture practices, fresh water fish production, ornamental fish culture, aquarium tank fabrication, decorative (decoupage) and studio pottery works, rain water harvesting, soap and other toiletry items making, preparation of watershed development plan, participatory resource appraisal, panchayath resource mapping, preparation of low-cost teaching-learning materials, rural sanitation and solid waste management, awareness creation on women's health and women empowerment, children's writers' camp, identification of biodiversity, people's planning at panchayath level and skill up-gradation of artisans and craftsmen.

Administrative Set-up of IRTC

Initially, IRTC was administered as the research wing of the KSSP, through one of its sub-committees. But, in 1995 it was found appropriate to register IRTC as an independent autonomous society, with its own governing body and executive committee. Thus IRTC was registered as a society under the 12th Travancore-Cochin Literary, Scientific and Charitable Societies' Registration Act, 1955, Kerala State with the registration number, 290/95. Its general body consists of the executive committee members of the KSSP in addition to twenty nominated members from among People's Science activists, scientists and academicians from educational institutions, research centres and governmental agencies. The general functioning of IRTC is governed by a twenty-member executive committee with the president of the KSSP as its chairperson. The Director is the chief executive officer of IRTC and the Registrar is in immediate charge of the management of IRTC. The research activities of IRTC are guided by a Research Advisory Committee (RAC) consisting of a number of senior scientists and experts from different fields, and co-ordinated by a Research Coordinator.

Library and Documentation Centre

IRTC has a modest library with about 9,500 books on various subjects, about 4000 study and research reports and other research materials. About 150 periodicals including science journals and magazines are regularly received by IRTC.

Because the IRTC library has a large number of journals in science and technology, exclusive reference books on energy, watershed, different branches of engineering, decentralisation, panchayathi raj, rural technology, paper clippings on contemporary issues, back volumes of various journals, a number of scholars and researchers from various institutions visit the library throughout the year. Documentation of newspaper clippings is done on the basis of subjects as well as contemporary issues, which are available for perusal for any interested scholar or layperson. Reprographic facilities are also available. A book binding section was started in the library recently.

Achievements in Replication of Technology

- Improved Smokeless *Chulha*: Hundreds of self-employed workers were trained in fitting/installing improved *chulhas* and more than five lakh units were installed in the sate so far.
- Low Cost Housing: About 250 masons were directly trained by IRTC and once the concept became popular other agencies also started similar training programmes. Thousands of houses constructed on these principles can be seen throughout the state.
- Rabbit Rearing: So far more than 500 persons including a majority of women were trained and a number of rearing units established by the trainees.
- Mushroom Cultivation: So far about 700 persons, majority women, were trained in this. Many of them have started their own production units. On an average about 1000-1200 spawn packets are being distributed from IRTC every month to the growers of mushroom.
- Hand Made Soap Production: More than 3500 persons were trained in this and about 2000 women are making a living out of

this. More than 5000 soap kits (each giving 20 soap cakes) are being distributed every month.

- Aquaculture: About 150 persons were trained so far in fresh water fish farming and ornamental fish farming. Training extended in azolla cultivation. Fish fingerlings are being supplied to farmers. Training is also given in aquarium tank fabrication.
- Vermi Composting: About 400 persons, mostly farmers, were trained in vermi composting and worms for the same are being supplied from IRTC.
- Nursery Practices: More than 50 persons, mostly women and farmers, were given training in agricultural nursery practices.
- Training is being given in motorised pottery wheel practice and decorative pottery making, like decoupage. So far about 150 potters were trained in motorised wheel and about 100 were trained in decoupage.
- Apart from the above training programmes, IRTC is providing technical support and consultancy in the areas like panchayath resource mapping, watershed based master plan preparation, solid waste management, power line mapping, rain water harvesting, etc. to LSGIs and other groups such as the non-government organisation (NGOs).

Networking

A unique feature of the development initiative of IRTC is the network of the People's Science Movement (KSSP) with units all over the state, the R and D centre of the IRTC with technical capability and liaison with the LSGIs. IRTC develops/adapts/adopts appropriate technologies, imparts training with the help of the LSGIs making use of their plans, and extends network support through KSSP.

IRTC has working relationships with other R and D institutions under the umbrella of the Science and Technology Council of the Government of Kerala, with NGOs and Kudumbasree (women's) self-help groups. In addition, IRTC liaisons with other people's science movements outside Kerala through the All India People's Science Network (AIPSN).

RECENT ACTIVITIES

IRTC has been continuously engaged in innovative activities of rural technology. A few of the important activities recently taken up by IRTC are the following.

Meenvallom Small Hydro Project

The detailed project report prepared by IRTC for the Meenvallom Small Hydro Project has been accepted by Palakkad district panchayath for implementation through a public limited company called Palakkad Small Hydro Company with the technical support of IRTC. The construction of the project will be done by Steel Industries Limited, Kerala and will be handed over to the Palakkad district panchayath.

The capacity of the proposed hydro plant is 3 MW and 8.4 MU of energy will be produced annually. The submergence area comes to 0.3 hectare of forest land, which is a very small area. The power produced will be fed to the KSEB (Kerala State Electricity Board) grid. The total estimated cost of the project is about Rupees 10 crore.

Women's Technology Park

A women technology park (WTP) was started at IRTC campus with the financial support from the Department of Women and Child and DST, Government of India in 2003. The major activities of the WTP are transfer of proven technologies readily available with IRTC to aspiring women through training and follow-up programmes and demonstration of live models in productive areas, which are commercially viable and technologically innovative. An emporium and information dissemination centre has been set up at the IRTC. The training programmes were arranged in the areas like hand made soap production, mushroom farming, ornamental fish farming, plant nursery practices, etc., especially for the benefit of women, many of whom belonged to the Kudumbasree units and weaker sections of society.

Watershed Based Development Project

IRTC's expertise in watershed based plan preparation has been

recognised by the government agencies and hence various block and grama panchayaths are approaching IRTC for technical consultancy in this area. As of now the project plan preparation for Ollukkara block panchayath (Thrissur district), and Sreekandapuram (Kannur district) and Thazhekkode (Malappuram district) grama panchayaths are completed. Work on Kunnummel block panchayath (Kozhikkode district) and Elikkulam grama panchayath (Kottayam district) are progressing. Implementation of similar projects under the *Hariyali* scheme of the central government is also supported by IRTC for the Palakkad district panchayath, and Malampuzha, Ollukkara and Chelannur block panchayaths.

Consultancy in Solid Waste Management

IRTC is providing technical support to the Palakkad municipality for installing a solid waste treatment plant. The installation is almost completed and the plant has started functioning partially. The technology involved is aerobic windrow composting, a methodology successfully tried out by IRTC on a small scale in Chalakkudy (Thrissur district). In addition to Palakkad municipality, several other local self-government institutions are approaching IRTC for consultancy in this area.

Technical Support for Developing Local Entrepreneurship

The Kanjikkuzhi and Aryad block panchayaths in Alappuzha district have jointly taken up a programme for micro-entrepreneurship development with the assistance from the government of India and approached IRTC for technical support. IRTC provided the technology for the production of hand made soap and toiletries, mushroom cultivation and vermi composting and offer technical support for creation of infrastructure facilities for the same. IRTC has conducted a number of training programmes in the above areas to the selected participants. A chemical laboratory and mushroom spawn production centre has been established for supporting the activities. IRTC is also taking part in motivating the local people, especially women to take up projects like soap production or mushroom cultivation as income generating activities. Several production units have come up as a result of this involvement of IRTC.

Modernisation of Techniques for Value Addition of Terra-cotta Products

The project aims to reduce the drudgery of the women pottery workers by providing pug mill as a community facility to be used by women who are at present engaged in the preparation of raw material using traditional manual processing. They are introduced to and given necessary training in designing and making glazed products with photographs which will add value to the wares and fetch more money to their products.

A pug mill is already installed in the IRTC campus and pugged clay is being distributed to the potters as door delivery at a nominal charge. Training is being given to the members of the potter colonies in studio pottery and motorised wheel. A programmable muffle furnace is already installed. Along with this a number of activities for the social uplift of potters is also being carried out.

Mapping of Fluoride Concentration in Drinking Water

Various studies have shown that the drinking water sources of many panchayaths of Chittur (Palakkad district) like Muthalamada, Kollengode, Kozhinjampara, Pattanchery, Vadakarapathy and Eruthempathy are fluoride contaminated beyond the permissible limits. IRTC has taken up a project for a detailed study of the fluoride contamination in these areas. The study proposed to chemically examine the drinking water sources in three panchayaths of Chittur taluk, namely, Nalleppilly, Kozhinjampara and Pattanchery. Based on the studies, a map was prepared indicating the concentration of fluoride contamination of water sources. The results obtained have been publicised at the panchayath level for necessary action. This will help people avoid using contaminated water sources for drinking purpose.

Centre for Ornamental Fish Farming

The ornamental fish culture is fast becoming a promising enterprise. There is good scope for taking up ornamental fish culture as a sustainable income generating occupation. It can be taken up as a household enterprise with necessary training. This can also be taken up

on a large scale with more initial investment. Similarly establishing and running aqua-shop is also a very attractive enterprise.

In view of this need in fish farming, through a DST funded project a centre has been set up at IRTC to impart proper training on ornamental fish culture, breeding and management, in addition to aquarium plant culture and tank fabrication. Utilising the facilities proper training is given to the prospective farmers especially women entrepreneurs and fish spawns are being supplied in a limited quantity.

Conclusion

In addition to those detailed above, IRTC is extending its technical support to the department of fisheries, government of Kerala for implementing a project in making and marketing toiletry items as a rehabilitation measure for the Tsunami victims in the coastal districts. Also IRTC has established a rural engineering centre with the help of the Kerala State Council for Science, Technology and Environment, at the campus in order to cater to the needs of inventors. A programme on rabbit fur processing has also been taken up recently with the support from the DST.

The campus has got a good computer centre with LAN and Internet connectivity. It also caters to the DTP needs of IRTC. The campus and its facilities are inviting other organisations to conduct their training programmes in this rural atmosphere. Further, thousands of students from schools and colleges visit this campus as part of their study tour. Several post graduate students make use of the research facilities of the campus for doing their project works.

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THREE Cs CONCEPT IN THE EDUCATION OF SPECIAL CHILDREN: AN INNOVATIVE EXPERIMENT OF CIMR

Adelaide C. Fernandez

Abstract

The three Rs system for the education of normal children has been used to educate the mentally challenged children also. This system is found to be unsuited for the education of the mentally challenged. Fr. Thomas Felix CMI through his research and studies has developed the three Cs system specially for educating the mentally challenged at the CIMR founded by him. This new concept is based on the four basic shapes - circle, triangle, square and rectangle - and natural colours. Instead of using the medium of alphabets and numbers to begin the education, children are helped through the medium of the four basic shapes. This means that they are guided through concrete and true experiences that will stimulate the motor, psychosocial, language and cognitive functions. In this process of education children simultaneously use all the five senses of seeing, hearing, touching, tasting and smelling. This approach is from concrete to abstract.

CIMR: HISTORY

The "Three Cs" concept was formulated by Rev. Fr. Thomas Felix,[1] the founder Director of the Central Institute on Mental Retardation (CIMR), Thiruvananthapuram, Kerala, for providing education to the mentally challenged children.[2] His first school for the mentally challenged was initiated in 1970 at Changanassery, Kottayam district and the system of education applied was the "Three Rs", the same system that was in

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place in normal as well as special schools all over the world. His mother had instilled in him, very early in his life, a commitment to work for the mentally challenged. He is an ordained priest, dedicated to work for his Teacher, Lord Jesus. He was happy to take note of the satisfaction, the parents of the mentally challenged attending his school have had, viz. that they did not have to worry about their problem child for 8 hours. His experience with the mentally challenged children showed that they hated their home as well as their school curriculum of Three Rs. So much so these mentally challenged come to school simply because there was somebody to talk to them, listen to them and tell them "good" very often. At the end of the first year itself, he got convinced that the three R system is an anathema to the mentally challenged, and that the development and normalisation of the mentally challenged cannot be achieved if the three R system is followed.

Fr. Felix started travelling through different states of India and over 27 countries abroad and visited special schools dedicated for the mentally challenged. He returned with the conclusion that he has to conceptualise and formulate a programme and experiment it within his school. His research work slowly gave rise to the three Cs system of education, specially crafted for the mentally challenged. This concept is practised in all the CIMR institutions, and the 20 teacher trainees who graduate as special teachers from the CIMR every year undergo this training.

CIMR Units

Over the years CIMR has grown and set up centres and units under it that carry on the work of CIMR with its principles. They include the Jeevan Prakash Child Centre, Integrated Montessori Kindergarten, CIMR Special School, Ashakendram, Developmental Centre for the "Mentally Retarded" (DCMR), Agricultural-horticultural Rehabilitation Farm, Freedom Centre and Equine Therapy Centre.

Jeevan Prakash Child Centre

Jeevan Prakash Child Centre was established in 1991 at Thiruvananthapuram in collaboration with Aktion Sonnenshein at Kinderzentrum, Germany under the guidance of Dr. Vojta and Dr. Theodore Hellbruegge. The centre provides Vojta therapy, Montessori

therapy and orofacial therapy.

The Vojta neuro-kinesiological examination of newborn babies and children, based on well known paediatric reaction to sudden postural changes, identifies developmental deficiencies in infants and applies the appropriate Vojta physio-therapeutic intervention, which will lead the child to grow in a normal way. Montessori therapy is for the mental improvement of a child with multiple handicaps. It is based on the concept and philosophy of Maria Montessori's educational principles of child development.

Orofacial Therapy: For many cerebral palsied and mentally challenged children, especially of Down's syndrome, orofacial dysfunctions are a severe health problem. These children suffer from drooling of saliva, breathing difficulty, feeding problems and articulation disorders. Orofacial therapy helps children in sucking, swallowing, chewing and breathing and it indirectly helps articulation.

Kindergarten and Special School

The Integrated Montessori Kindergarten, where developmentally delayed children are integrated with normal children, functions under the CIMR at Thiruvananthapuram. The CIMR Special School for mentally challenged students is also functioning in the CIMR campus at Thiruvananthapuram.

Ashakendram

Ashakendram, the first special school cum rehabilitation centre of CIMR, was started in 1980 at Ernakulam (in the port city of Kochi). The centre has facilities for special education using the three Cs, art programme, music, vocational training and medical rehabilitation. It is considered as a model centre located in the central part of the state of Kerala.

DCMR

The Developmental Centre for the "Mentally Retarded" (DCMR), a normalisation model centre for mentally challenged children,

was started in 1984 at Jagathy, Thiruvananthapuram. This centre is located in a spacious building in a unique campus. Children are undergoing training in various aspects of rehabilitation, including special education using the three Cs concept, vocational training, arts programme, sports, music, drama, drawing, painting etc.

Agricultural-horticultural Rehabilitation Farm

An agricultural-horticultural farm was established in 1996 on a ten and a half acre plot at Kuttichal, 30 km. away from city of Thiruvananthapuram. This serves as the vocational training centre for the students. Activities in this farm are structured to develop in the children independent, community living skills and to make them self sufficient through total development leading to employment.

Freedom Centre

The Freedom Centre is a unit of CIMR for performing arts for and by the mentally challenged. The centre is located at Kovalam, a beautiful tourist destination near Thiruvananthapuram. Dr. A. P. J. Abdul Kalam, the then Principal Scientific Advisor to the Government of India (and later the President of India) inaugurated the centre on 28 May 2000. The centre is conceived as a place of performing arts for the mentally challenged and for their family members too. Freedom centre is also a place where continued training is given to the mentally challenged persons in art and music. It is also a place for interaction, especially for the mothers/family members of the mentally challenged. The centre also serves as an art gallery for the exhibition of paintings by the mentally challenged and the family members. In short it is a centre, where the mentally challenged persons from anywhere can come and get trained.

Equine Therapy Centre

CIMR has two horses in its equine therapy unit. Here the mentally challenged children are given the opportunity to work with horses. This opportunity allows them to touch and massage them, clean their body and hoofs, and also lead them by the reins. All these are done under strict supervision and using personal protection of

equipments. This training will make them more courageous and independent in so many other activities that are routine in day-to-day life.

CIMR, New Delhi

In addition, CIMR has a centre at New Delhi. It has the function of co-ordinating the different programmes for the mentally challenged and their families.

Training Programmes

CIMR is offering a number of training programmes for the education, training and rehabilitation of the mentally challenged children. They include programmes of teacher training and mother training.

Diploma in Special Education

Since 1980 CIMR has been conducting a teacher training programme - 'Diploma in Special Education (Mental Retardation)' [DSE (MR)] for the aim of producing competent teachers with global perspective on the problems of the mentally challenged persons and with a thorough grasp of their basic talents for making the mentally challenged person a useful and productive member of his family and community. This course of two year duration is recognised by the Rehabilitation Council of India (RCI), which is a government regulatory body. The minimum educational requirement for admission to the course is successful completion of the plus-two examination. At present the 38th and the 39th batches, i.e. 40 trainees are pursuing the Diploma in Special Education. The teacher trainees of the centre have identified more than 42000 mentally challenged, who were not getting any service from any other organisation.

Foundation Course

CIMR is an approved study centre for conducting the "Foundation Course on Education of Children with Disabilities" which

is jointly offered by the Madhya Pradesh Bhoj Open University (MPBOU) and the RCI. It aims to develop understanding and basic competencies in teachers for handling children with disabilities. This is a distance education programme with three months' duration.

Continuing Rehabilitation Education

CIMR's programme of continuing rehabilitation education (CRE) aims to give current knowledge to those who are working in the field of disability. The CRE programmes are conducted by the RCI.

Short Term Training Programme

As part of the panchayath rehabilitation programme, CIMR is conducting short-term training programmes for parents and volunteers in training and rehabilitation of the mentally challenged children.

Home Bound and Community Based Rehabilitation

Once the disabilities are identified in children, home based training is conducted with the help of the programme of 'home a school'. A teaching manual, evolved specially for this purpose, and special teaching and learning materials are also given. Special teachers from CIMR train the family members how to integrate children within families. CIMR's programme of community based rehabilitation (CBR) has yielded excellent results. As on date there are 99 CBR centres functioning under the efficient guidance of CIMR. Residential programmes are conducted at Kuttichal and Kovalam to improve independent living skills in mentally challenged children, coming from various panchayaths. Training in independent living skills, vocational training in agriculture, training in arts and cultural programme etc. are given to these groups.

Mothers' Training Programme

Training the parents of the mentally challenged is of prime importance in the developmental training process for the mentally challenged. Parents, especially the mothers of the mentally challenged

play a crucial role in their developmental/ normalisation process. Therefore CIMR initiated a training programme for the mothers of the mentally challenged persons in 23 states of India and identified more than 40,000 families as the prospective trainees. This was an off-shoot of the national pilot project undertaken by CIMR. Mothers from even Jammu and Kashmir along with their mentally challenged wards participated in the above programme.

Peer Group Awareness Programme in Normal Schools

This programme is a new initiative of CIMR. It envisages integration of the mentally challenged children with normal children. It includes stage programmes of music and art by mentally challenged children in the schools for normal children. This becomes a forum for the normal children to get familiar with the systems, techniques and tools that are used for identification and developmental training of the mentally challenged.

THREE CS: INTRODUCTION

"Mental retardation" was a new word to me at the age of 54 even though persons with developmental disorders were in the family circle. They were noted as slow developers compared to normal persons at their age. They attended normal schools for some time and spent most of the time at home, as "special persons". As an expert in animal welfare regulations I was consulted by CIMR whether they should register their farm with the Committee for the Purpose of Control and Supervision of Experiments in Animals (CPCSEA). I went to see their farm and saw the special children tend the garden and take care of farm animals. I got the word "mentally retarded" from the title of CIMR. I listened to the Director about his past work in the service of the mentally challenged persons.

As a professional scientist and the father of three normal children, it was very clear to me that the development I noticed in the mentally challenged persons in CIMR institutions was a result of the application of "three Cs concept" of education. It appeared to me that if I had the three Cs concept and the "Home a School" book, the result of Rev. Fr. Thomas Felix's research studies (produced by Rev. Fr. Felix),

would have been with me in 1982, my children would have had a smooth introduction to the alphabets and numbers and other matters in the environment. This wonderful feeling is the background in which I took time to understand the three Cs concept and do an assessment of its possible impact in educating children.

In the disability circle, mentally challenged persons stand apart because body part or organ affected is brain or other neurological structures. This invariably affects their IQ and as a result learning to write, read, doing arithmetic and even speaking normally become very difficult or not at all possible. For educating the mentally challenged the universal system of three Rs is practised even now. Further, recent view of the education planners under "integrated approach" is that there is no need for special schools. Disabled should attend normal school where special teachers are among the staff. There is no data available on how many of the persons in these committees of planners taking such decisions have some experience in teaching or care and management of these special children. The CIMR initiated its schools with the above background information well deep into their heart and mind. Within three years of their introductory work CIMR noted that.

Materials and Methods

Children of any age are given admission to the special schools run by CIMR. The only requirement was that they are mentally challenged and should have a guardian or parent willing to be in constant touch with the school authorities. The staff are persons who have undergone special training to care, manage and educate the mentally challenged with kindness and compassion. Experts in games and sports were also available as staff. The school has closed as well as open space as classrooms. Further facilities for outdoor games and sports were available.

For getting admission in the CMIR school, on the day of appointment the candidate has to report to CIMR for an assessment along with her/his parents, brothers, sisters etc. Usually this assessment is made to understand the nature and extent of disability, and attitude of parents and siblings. The time taken is different for different families.

As a closing session the candidate and the family members are shown around the facility.

Students are encouraged to come to school and return home using public conveyance. Parents are requested to give importance to this point as following this instruction is part of the educational programme. If parents are in the habit of dropping their normal kids using personal conveyance, they are advised to do the same for their mentally challenged child as well. They are also instructed to take turn in the sequence of dropping. That is, the normal child should see the school of the mentally challenged and vice versa.

School programmes of each day start with a morning prayer and close with the national song. This is done without fail and in right time with the class teacher in the lead. The daily programme is broken down into as many activities as possible. Each activity is supervised by different teachers. Specifications of the time and name of activity, the name of the person leading the activity, reporting of the activity etc. help stimulate the sensory organs as well as the thought process of the student. Everyday the staff have to prepare the work report in which assessment of the students is a part of the daily work. If there is deficiency in attention, lack of interest, agitation, non-cooperation etc. on the part of the student, the teacher will have a discussion with the parent in order to find out the cause so that the teacher and the parent together can design and apply the remedial action.

The constant care and continuous assessment offered to the student builds up a healthy relationship of teacher-student-parent triangle which has great meaning. This ensures daily enquiries and communications at home, which make the mentally challenged a great and accepted person at home, very often better equipped than a child attending normal school in ethics, daily chores and accepted behaviour.

The curriculum of the CMIR school is full of activities. Major activities are described in detail and they apply as various methods to stimulate different senses of the body. A day in CIMR schools means that the mentally challenged irrespective of the extent of disability goes through a number of CIMR special school activities. Following is the categorisation and listing of the different activities.

1. Shape Based Classes:
1. Knowing the shapes
2. Making the shapes
3. Selecting the shapes
4. Combining the shapes

2. Other Classes:
1. Home a school
2. Teaching materials
3. Puzzle making
4. Drawing and painting
5. Montessori class

3. Academics:
1. Reading
2. Writing
3. Number concept
4. Time concept
5. Money concept
6. General knowledge

4. Physical Exercise:
1. Stretching exercise
2. Free-hand
3. Aerobic
4. Yoga
5. Musical exercise

5. Sports and Games:
1. Basketball
2. Volleyball
3. Football
4. Indoor games
5. Badminton
6. Cricket

6. Music:
1. Classical music
2. Light music

7. Performing Arts – Dance:
1. Bharathanattyam
2. Mohiniattam
3. Nadodi nirtham
4. Kuchupudi
5. Odissi
6. Cinematic dance

8. Instrumental Music:
1. Bongos, thabala
2. Rajasthan drums
3. Tripple drum
4. Sitar
5. Guitar
6. Veena
7. Violin
8. Thamburu
9. Harmonium

9. Out-Reach Programme:
1. Outing/ site seeing
2. Kuttichal agricultural farm visit
3. Freedom centre visit

10. Agriculture:
1. Planting of seeds
2. Familiarisation with differences and uses of flowers and fruits

11. Care and Management of Domestic Animals:
1. Chicken, duck, love birds
2. Rabbits, guinea pigs, goats, cows, pigs, fish

12. Kitchen – Cooking:
1. Making/serving coffee/tea and rice
2. Washing utensils and cleaning kitchen

13. Vocational Training:
1. Candle making
2. Flower making
3. Screen printing
4. Cover making
5. Workshop training
6. Car driving
7. Craft

14. Therapeutic (Horse) Exercise:
1. Familiarisation
2. Grooming
3. Leading by rein
4. Saddling and riding

15. Recreation:
1. Story telling
2. Action song
3. Watching TV
4. Listening music

All these activities are structured and based on the three Cs concept.

UNDERSTANDING THREE Cs CONCEPT

The three Cs stand for comprehension, competence and creativity. Every newborn child comprehends the living and nonliving

objects of the world, may be through shapes, colour, smell, touch and sound. Through this comprehension, the child develops competence, competence to differentiate between father and mother, between mother and mother's sister etc. Competence at its peak kindles creativity. Thus the three Cs of comprehension, competence and creativity are established. In the three Cs system of education the main components of the alphabets and numbers of the three Rs system become just two components but not the basic pillars of education. The development of the three Cs concept took around ten years.

From 1980 CIMR was able to implement the three Cs system in a structured form successfully in its institutions in Thiruvananthapuram, Kochi and New Delhi. Through the community based rehabilitation programme, the three Cs concept was implemented in 84 panchayaths of the Thiruvananthapuram district and 24 panchayaths of Kochi (Ernakulam district). Subsequently 40,000 families of the mentally challenged persons in 23 states of India were identified and developmental training was given to them using the three Cs educational concept through a national project under Ministry of Social Justice and Empowerment, Government of India.

The Three Cs Concept

The three Cs concept is based on the four basic shapes - circle, triangle, square and rectangle - and natural colours. Instead of using the medium of alphabets and numbers to begin the education, children are helped through the medium of the four basic shapes. This means that they are guided through concrete and true experiences that will stimulate the motor, psychosocial, language and cognitive functions which will lead to development. In this process of education children simultaneously use all five senses of seeing, hearing, touching, tasting and smelling. This approach is from concrete to abstract. Alphabets, numbers and measurements can also come from shapes.

Shape based curriculum permits the child to internalise the concrete world around him/her at his/her own pace. He/she is introduced to the basic shapes. He/she has the option to scribble or draw shapes or make shapes using any medium like paper, clay and wood. He/she then compares the four basic shapes with materials and things in his/her immediate surroundings. Thus he/she comes to know the shapes and make them. This leads to the development of various skills, such as selecting shapes, making choices of materials, and thinking logically, rationally and aesthetically.

Once the child is thorough with the shapes he/she is guided to select shapes so that he/she can conceptualise and make materials and things. Using circles and triangles he/she can make bicycle. With circles and rectangles several things can be made, such as car and motor vehicle, and tea (combined with tea powder, sugar, fire, vessel, water and filter).

The more the mentally challenged person gets the inputs, interacts with shapes and comprehends things and materials, the more will he/she be able to develop creativity. This is the innovativeness of the three Cs concept of comprehension, competence and creativity. Creativity is the measure of the attainment of ability to make decisions and act accordingly.

In the three Cs concept, mother becomes the teacher and home becomes the school. House of family of any strata of people (i.e. palace, middle class house or hut of lower class) will have all the basic shapes and a mother. The mother is more involved in the development of her ward than anybody else. In the three Cs concept any task taken for teaching or training will be implemented in the following seven steps.

1. Decision on what is to be done and what are the needed materials (identifying materials).
2. Shapes and colours present in the materials are collected from their task.
3. Learning the alphabets and words involved in the activity (of materials).
4. Measurement and number involved in the task.
5. Functional movement and related development (development of four functions related to the task).
6. Acquisition of skills and related movement.
7. Total understanding and mastering of the task (development of three Cs, i.e. comprehension, competence and creativity).

Take the example of the task of making tea. The needed materials are listed, viz. vessel, cover for the vessel, water, tea powder, milk, sugar, tea spoon and cups to measure and serve, the stove or burner, fire, match box and tea filter. All these items have their own shapes, structure and colour. Their names are learned, shapes and structure are noted, the use of each item is imprinted in mind, and alphabets related to the name and use of vocabulary are familiarised. Measurement of how many cups of tea, for how many persons, how much tea powder, how much sugar for one cup and how much for more cups is learned. Activities such as collecting water (with knowledge about purification and source of water), washing utensils, measuring water, lighting the burner, putting the vessel on fire, closing the vessel, waiting for water to boil, adding the measured tea powder, switching off the flame, giving time for tea to be extracted (depending on whether it is tea leaf / tea powder/ tea bag), filtering the tea, adding milk and sugar, mixing them, measuring tea into cups, putting the cups in trays, cleaning and drying hands, and finally serving the tea. So the skills of tea making and serving are acquired, and mind and body have been actively engaged in the total understating and mastery of the task. In this way the seven steps are really turning into an educative tool to understand the different shapes, different words, volume, weight, colour etc.

ROLE OF THREE CS CONCEPT IN MEETING THE CHALLENGES IN SPECIAL EDUCATION

The main challenge in the special education of the mentally challenged is that of alphabets and numbers. It is a common practice to measure the educational capability of a child by some arbitrary tests and rate it as IQ (intelligence quotient) and segregate him/her into the group of “retarded”. The application of the three Cs concept is meant to meet this challenge of segregating and alienating the mentally challenged from the normal members of the family, community and nation as a whole.

The effectiveness of the three Cs concept has proven beyond doubt when 72 mentally challenged children marched past our national flag in front of the VVIP pavilion during the Republic Day parade of 1999 and won the second prize for their dance and song. Judges never knew that this contingent of children comprised of mentally challenged children.

Staging of Ramayana Bale in Vigyan Bhavan, New Delhi, representing India in the Para-Olympics, 2001 in Madrid, Spain and two of the mentally challenged completing the training in an institution of national importance in the management of laboratory animals are some of other achievements of the mentally challenged persons trained through the educational system of the three Cs concept. That is to say, the application of the three Cs concept has enabled the mentally challenged to meet the challenges in their total development, so as to lead an independent life to get integrated into the community and the nation.

These children progressed well beyond the routine vocational training in making candles, cleaning solutions and notebooks. They can effectively play various musical instruments and perform various forms of dance, and engage themselves in several activities such as horticulture, agriculture, water harvesting, farm managements etc. They are able to address their colleagues on occasions like birthday and at festivals like Onam and Christmas. They can say thanks to teachers and know more names of fruits, flowers, animals, games etc. They learn to behave in the society in a manner that reflects total development of physical, mental and moral faculties. All these activities will lead a mentally challenged person to develop in an exceptional way so that he/she can become even more competent and creative than a normal child. The latest evidence is that the senior students of CIMR were able to easily learn the basics of caring for horses, grooming them, walking with them, saddling and trot riding them with three weeks of training. Two horses of the Indian Army were donated to CIMR on 26th June 2007 by Dr. A.P.J. Abdul Kalam, the President of India for the equine therapy of the mentally challenged.

Innovative Aspects of Three Cs Concept

The Three Cs concept of education is based on the four common shapes. It is simple and can easily be assimilated even by an illiterate. It is this innovative aspect that made it applicable at the grassroots level. In addition to its large scale use in the panchayaths of Thiruvananthapuram and Ernakulam districts, the three Cs concept was tried in teaching 30 school drop-outs of various ages. After three months, 30 per cent of them went back to school. Everybody agreed that the difficulties in the learning process they encountered during their initial

classes were the basic reason for their dropping out from the school.

A small exercise in the application of the three Cs concept was done with the nursery children in order to understand its effectiveness. The normal students of a LKG class were divided into two groups. One group received introduction to the three Cs concept before they got initiated into the routine LKG lessons, while the other group directly got into the routine LKG training. The group that had the introduction to the three Cs concept showed eagerness to come to the school, was regular in attendance and had better performance record in learning, when compared with the other group. The three Cs concept was found to be useful not only in academic learning, but also in vocational training and in building up skills for independent living and employment. The recreational element inherent in the three Cs concept adds to its child friendly quality.

Practical Significance of 3 Cs Concept

The mentally challenged are the most neglected among the disabled as their condition does not permit them to come together to fight for their cause. Surveys show that there may be 12 million mentally challenged children below the age of 18 in India. The question is this, how a country can boast as developed when about 12 million of its population remains undeveloped. Each mentally challenged person should be reached and helped to gain total development. This will lead him/her to be a productive person and not a mouth to feed. This will also lead to the true development as even the mentally challenged will be able to contribute to the development of our nation's economy.

OBSERVATION

CIMR initiated its education centres for the mentally challenged using the universal conventional three Rs system. They also set up boarding facilities attached to the school for overcoming the problems and hazards of transport as well as alleviating the inconvenience and pain of the parents. Special teachers were available for educating the mentally challenged.

The three Rs system, even though implemented systematically

with the help of qualified special teachers, was not of much advantage to the mentally challenged. Even the mildly challenged found it difficult to match the demands of three Rs system, designed for normal kids with normal IQ levels.

CIMR also noticed that there is need of early identification of mental disability. Early identification could help early intervention which will reduce the severity of mental disability and also the period required for the process to normalisation.

CIMR also observed that setting up and running special schools with boarding facility up to 10+2 classes would be detrimental to the total development of the mentally challenged. CIMR learned the hard way that the mentally challenged children should not be plucked away from their home for the purpose of education.

CIMR felt the urgent requirement of a new educational concept for teaching and leading the mentally challenged to their development and integration with the community. Fr. Felix has already noted that there is enough scope for improvement in the condition of the mentally challenged children, if we can simply accept them as we do to our normal child and help them have their own time to learn to live and acquire knowledge. He stressed the point that managing alphabets, numbers and a higher IQ does not make a human being. His objective is to make every mentally challenged child a totally developed human being.

Fr. Felix believed that the mentally challenged do possess the very same four functions which great personalities like Abdul Kalam, P.T. Usha and Guru Kalicharan have had, viz. motor, psycho-social, language and cognition. So if we can stimulate these functions our mentally challenged friends too can develop into successful human beings. If we can teach them to make use of all five senses of seeing, hearing, touching, tasting and smelling, it becomes simple to stimulate the four functions. His search for the new concept of education gave rise to the three Cs concept.

CONCLUSION

The daily prayers and singing of the national song in the closing

time have tremendous impact on the mentally challenged students. They have been familiar with the needle position of the clock showing the prayer time and prepare themselves for the prayer activity. They learn to say that it is 09.30 and let us pray. Through this prayer activity time sense, punctuality, the solemn requirements for prayer and *deshabhakthi* of a citizen are encoded. This activity alone gives chances for learning many words and then using them in appropriate time and phonetics, such as: “it is time, it is right time, five minutes of right time, five minutes past right time, you are late, I am late, I am in time, teacher please come, start the prayer, prayer is over, let us sing the national song, everybody keep silence.” They also learn to observe and say who are all regularly late, punctual in coming to class, who come quite earlier, and who all take part actively. There are variations in the use of speech or keeping mum. But you will be able to talk to them and elicit proof that they know the words and their appropriate meaning.

The travel to school and back home in public conveyance will prepare the mentally challenged to understand the common methods of transport, waiting for the transport, getting into the transport, the need for taking tickets, how patiently one has to wait for the transport to reach destination, how to identify the destination and make request for stop, and also the attitude of the community. It also helps the community understand about disability and accept the disabled and thereby help their integration into the society. These travels play a crucial role in the development of a mentally challenged into a capable person to share common facilities as normal persons do and to grow with the community.

The different activities that the mentally challenged is programmed to take part each day are so scheduled to stimulate all the human senses and activate every muscle in the body, so that every related neuron is stimulated and kept active.

The three Cs concept postulated and proven by Rev. Fr. Thomas Felix CMI, the founder director of CIMR, is a panacea for educating the mentally challenged. The shape based curriculum with the educational materials, structured activities in the class and the teacher-student-mother triangle together can bring in total development of the mentally challenged persons. The level of achievement of the mentally challenged students attained through the new educational three Cs

concept is amazing.

Fr. Felix through his studies and research has designed the three Cs concept. It is proven beyond doubt that early identification, early intervention and three Cs concept of education together can make the total development of the mentally challenged at a faster rate. The three Cs concept holds exceptional promise even as a new tool for elementary education in the educational scenario of the normal children too.

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[1] Fr. Thomas Felix, Director, CIMR, Murinjapalam, Medical College P.O., Thiruvananthapuram – 695 011

[2] The term mental retardation was in vogue, at the time of founding the CIMR, to refer to the situation of the mentally challenged persons. The term continues to remain in the name of the organisation.

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INNOVATIVE PRACTICES OF COMMUNITY PARTICIPATION IN SUSTAINING JALANIDHI PROJECT

Albert Kuruvila

Jalanidhi is a programme of the government of Kerala with the financial support from World Bank for providing safe drinking water with the participation of the beneficiaries, that is, the local community, which is formed into a beneficiary group (BG), and the local self-government in rural areas. The project is set up with the government assistance and the community or the BG is expected to operate and maintain it on its own. It has to deal with any problem that arises in the course of maintaining the infrastructure (pipeline, pump and motor, and tank) and distributing water to the beneficiaries. Following are a few cases of how the local community of the beneficiaries resolved the issues that arose in the operation of the jalanidhi project.

Sharing Water, the Precious Resource

The jalanidhi project of the Pullupara BG in Pokottoor panchayat of Malappuram district has 53 member households. There were five households that were not part of the BG of the jalanidhi project in the village. The non-members had their private wells close to the common well of the BG. They complained to the BG that the water level in their wells went down in summer because of the increased pumping from the jalanidhi common well. The five non-members objected to it and tried to make it as a communal issue.

In response to it the BG convened a special meeting of the members to discuss the issue and they accepted that water is a basic necessity for everyone. So they decided to allow the non-members to install their motor pumps in the common well and draw water as an alternative arrangement.

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