Computer Assisted Training Programme for Early Intervention for Children with Mental Retardation

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Abstract. Mental retardation is the worst of all human handicaps. An estimated 2% of the population suffer from this handicap. The earlier the intervention the greater is its effectiveness. There is hardly any systematic programme of early intervention suited to the cultural milieu and socio-economic conditions of India. Noting the need for an indigenous programme suited to the country, Indchem Research and Development Laboratory developed a computer assisted programme of training for children with mental retardation. The curriculum of training was developed by an interdisciplinary team of experts in the field. A logic was developed to relate the pre-requisite skills in different developmental areas to those in the area of Self-Help. The programme called *Upanayan* (To lead along) is confined now to children with mental retardation in the age group 0-2 years. The mothers are trained on this programme to train the children.

The computer assistance for the training programme was developed in Microsoft 'C' and operates on an IBM compatible PC/AT. A programme for recording the data on children under training and their progress facilitates the setting of goals and the monitoring of progress.

Parents of children at Madhuram Narayanan Centre for Exceptional Centre, Madras, use this programme for early intervention. The programme for the children has been documented and the results of training using it are satisfactory and encouraging.

1. Introduction

1.1 Indchem Research and Development Laboratory is a scientific association recognised by Government of India and dedicated to research and development in the field of electronics. As a part of its societal responsibility, the laboratory took up a project in 1987 for the developmental training of children with mental retardation in the age group from birth to two years.

1.2 In a survey prior to this, the Laboratory had noted that mental retardation was the worst and the most neglected of all human handicaps and that the services to persons with this category of handicaps, were poor in this country. The estimated number of persons with this handicap is about 1.8 million i.e. about 2% of the country's total population which is nearing 900 million. Out of these only about 70,000 persons receive the services needed. This is because of the paucity of trained teachers and the lack of suitable material for imparting training. There are only about 5,000 special educators and there will never be a situation when there are enough teachers to serve the vast population with mental handicap. There has been practically no worthwhile standard material produced in the country as there has been hardly any research in the field because of limited resources. Whatever programmes have been used are drawn from western sources not quite suited to the socio economic conditions and cultural milieu of the country.

1.3 Early Intervention

The organisation also noted that earlier the intervention in the case of the handicap, the better the chances of reducing its impact as established by a number of pioneering studies in India and abroad [1,2,3,4]. It noted that there was an urgent, felt need for a standard, systematic tool for providing early intervention services appropriate to the conditions in the sub continent.

1.4 The potential of the micro computer

The organisation took note of the potential of the micro computer in this area, its capacity to receive, store and enable retrieval of, a large amount of information/data and its capability to be the platform for an expert system. It was envisaged that the computer will enable provision of services to a much larger population than the traditional methods of training.

2. The Upanayan Project And The Early Intervention Programme

2.1 The Laboratory took up a project for the development of a programme of early intervention which could be understood and implemented by mothers of children who need such services. The programme named 'UPANAYAN' to signify the 'leading to progress' of the child by the mother was evolved by an interdisciplinary team of experts in the field, comprising, amongst others, a neo-natal pediatrician, developmental psychologists, special educators, a speech therapist, a physiotherapist and an occupational therapist. [5]

- 2.2 The interdisciplinary team identified 250 discrete skills in the five developmental areas Motor, Self-Help, Language, Cognition and Socialisation as the optimal ones for the training of children with the handicap.
- 2.3 The intervention system consists of (a) a developmental check list of skills for assessment and programming, (b) a profile to record the observation and (c) intervention strategies in the form of activities to train the mother/ professional to train the children in all the skills in the check list. Formats to evaluate the efficacy of the programme and the methodology of activityoriented intervention strategies for the acquiring of the skills by the child were developed. The programme was field-tested and its workability and suitability established.
- 2.3.1 To give the necessary visual impact, the activity modules were illustrated with over 600 photographs of children performing the various skills.
- 2.3.2 The are of Self-Help was considered as the priority goal by the parents. The related skills in the other developmental areas which are pre-requisites for the achievement of a particular Self-Help skill are shown as `Linked Skills' at the end of the module for each Self Help skill.

3. Computer Assistance To The Training Programme

- 3.1 The text of Upanayan Early Intervention Activities corresponding to the 250 skills are stored in the hard disk of a personal computer along with the photographs illustrating these activities. Any desired skill and activity could be called and displayed.
- 3.1.1 The training package comprising the text and photographs was developed in Microsoft 'C' (version 6.0.). the text of the instructions on the intervention activities was edited using the Northern Editor (NE). An IBM compatible PC/AT with a hard disk capacity of 10 MB, along with an VGA monitor, is used in the system operated.
- 3.2.2 Relevant particulars of the child and his parents, his medical history and his performance on the skills are recorded in the computer. His performance on the skills appropriate to his age at the initial assessment and at the subsequent quarterly assessments are also recorded. The mother sees the performance profile of her child on the screen after every periodical evaluation, after which new goals and objectives are set by the teacher in consultation with the mother, based on the the child's achievements and his priorities. An Individual Programme Plan is then worked out for the child and implemented.

- 3. 2.1 The process of training and evluation mentioned in para 3.2 continues.
- 3.2.2 The programme for recording the data on children and the progress of their training was developed using the 'Clipper'.
- 3.3 The mother goes ahead with the programme till the child acquires the necessary skills.

4. Application

The programme is in use at Madhuram Narayanan Centre for Exceptional Children established at Madras, India, in 1989, as a division of Indchem Research and Development Laboratory for providing early intervention services using the Upanayam programme. The Centre has been using the programme effectively over the last 5 years, with nearly 340 children on its rolls now. It is noted that the parents and the teachers were particularly motivated by the novelty of the computer assisted programme which displays the programme graphically on the monitor apart from the efficacy of the training itself and the progress acheived in the child's development.

The centre has trained teachers from 16 institutions in the country on the Early Intervention Programme in the print form. As these institutions do not have the computer facility, they were not trained on the computer version of the programme. The centre plans to train teachers from other institutions on the computer assisted programme when computer facilities are made available in the various district headquarters in the neighbourhood of these institutions.

5. Future Plans

We propose to convert the basic modules developed in the computer into an Interactive Visual Training Programme. This interactive visual training programme will enable the linking of the related skills in different developmental areas to facilitate correction in the training activity, where necessary, and re-training, as needed.

Multi-media tools will be used for developing the above said visual training modules. The training modules will employ step-by-step approach with digitized pictures of the actions in the training process and voice explanation of the same. Facility will be provided for retracing the steps and the related pre-requisite skills for any specific activity. By developing interactive visual tools to aid training, we plan to make learning more enjoyable and rewarding. This will also eliminate the need for experts to be available in all places where training is given. Indchem Research and Development Laboratory is presently engaged in the development of a multimedia tool. This tool will be utilised for the purpose mentioned above.

The future plan also includes providing computer aided on-line interaction with different groups by employing state-of-art technology and development and implementation of performance contoured programme of training.

6. Conclusion

- 6.1 Computer assistance to the Upanayan Early Intervention Programme has facilitated the easy implementation of the programme, assisted in monitoring the progress of the children and enhanced the effectiveness of the system of training.
- 6.2 The computer assisted programme has the potential of the extension of the services to a much larger population than the traditional methods and of enhancing the quality and effectiveness of these services.

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