Interactive Multimedia and Tablet Enabled IMNCI Package for Health Professionals

Background

The Ministry of Health and Family Welfare is implementing the Integrated Management of Neonatal and Childhood Illness (IMNCI) as a key child health strategy within the National Reproductive Child Health Programme II and the National Rural Health Mission. The School of Health Sciences (SOHS) of the Indira Gandhi National Open University (IGNOU) launched its Post Graduate Diploma in Maternal and Child Health (PGDMCH) in 1997-98. Integrated Management of Neonatal and Childhood Illness (IMNCI), which was introduced in 2003, is a crucial component of this PG Diploma and it contains very significant practical training. Many face-to-face training programmes are conducted by GOI, and agencies like UNICEF and WHO to provide training in the Integrated Management of Neonatal and Childhood Illness (IMNCI) component to the medical practitioners, health workers up to the grassroots. While each of these interventions has shown great success, accumulating evidence suggests that there is a need of a mechanism to train thousands of medical practitioners, up to the grassroots in minimum time frame. NCIDE and SOHS collaborated towards integrating the IMNCI training component (except bed side teaching) into a digital interactive multimedia package for all health professionals who are involved in the care of children.

Need of the Innovation

The Integrated Management of Neonatal and Childhood Illness is all about guiding the health professionals to assess and manage sick young infants and children and provide counselling to the mothers and care givers. GOI, UNICEF and WHO have worked out a strategy by way of which the health professionals can organize the above mentioned task by using a series of algorithms. The training component, i.e. teaching-learning transaction is handled through a 11-day F-IMNCI training programme, of which a 8-day training course is a part wherein we have a combination of classroom work and clinical practice. The challenges faced by the training programme are as under :

- Making the training programme accessible to the health professionals at the grassroots level.
- Tailoring the quality of the programme in accordance with the need-base of the people.
- Meeting the timelines which are quite stringent.
- Cost-effectiveness of the training programme.
- Effective follow-up pursuant to a suitable feedback mechanism.
- Periodic updating of the training content.

These challenges motivated the innovators to develop a product to change the way education and training are imparted to pre-service and in-service doctors for the IMNCI component by designing, developing and testing the IMNCI training package for the health professionals.

Description of the Innovation

The National Centre for Innovations in Distance Education (NCIDE) in collaboration with School of Health Sciences (SOHS) under the UNICEF funded project have integrated the IMNCI training components (except bed side teaching) into a digital interactive multimedia package enabled by virtual training scenario which consists of built in textual descriptions, animations, images, videos, learning opportunities and self-evaluation. It also includes sections like resources, quiz-bank, glossary, and videos to train all health professionals who are involved in the care of children.

Through this package we have introduced a long-term innovative ICT enabled mechanism for providing a quality assured, dynamic, cost effective and accessible training through trainee centric pedagogic approach, and simple platform independent technology by replacing face-to-face training sessions with the interactive multimedia package except the bed side teaching component.

The effective deployment of the IMNCI training in varied training environments with heterogeneous group of trainees is a complex process. It required a lot of planning at the initial stages when the project was approved. This was the initial stage in which we collected raw data like soft copies of IMNCI modules, videos already developed by UNICEF and other ppt and pdf resources and processed the recruitment of project staff. In view of the dynamic nature of the project, readiness in infrastructural, technological, and content domains were assessed. After the readiness assessment a prototype of the model was developed to identify operational problems, scarce of resources, system errors; screen out possible failures like technological or pedagogical or even managerial. The prototype development saves time, cost and improve usability of the product; correct the errors and to design our working strategies for developing the final product. The Spiral model of Software Development Life Cycle was used to design the prototype. This enabled the team to release the software incrementally which resulted in the increasing refinement of the material developed each time it goes around the spiral. The major steps of the spiral model are as follows :

1. Finding out the requirements of the IMNCI package and identifying the measures to be taken to achieve the requirements.
2. Developing a detail plan to implement the development of the IMNCI package and design the components like script based on the content, assessment, screen layouts, flowchart of working, etc.
3. Designing of interface, navigation scheme, xml schemas for quiz and other dynamic content, editing of audio and video of the prototype, development of animated texts and images.
4. Demonstration of the prototype of the IMNCI package developed to the stakeholders, experts, academics for its functionality, reliability and usability. Demonstration of prototype goes through cycle of iterative process of obtaining feedback from the stakeholders and making subsequent improvements. The cycle is repeated until the right prototype is developed. Once the right prototype is obtained then the development of all the modules take place.

The content of the package includes the IMNCI training modules followed for training the physicians.

Figure 1 : The Package

Different Components of the Interactive Multimedia enabled IMNCI Package are described below :

a. **Virtual Training Scenario :** In this package we have simulated the face-to-face training scenario into virtual training with animated characters of master trainers and trainees. (See Figure 2)

Figure 2 : Virtual Training Scenario

b. **Interactive Multimedia Enabled Learnlets :** The Interactive Multimedia enabled learnlet has an introduction to the topic, it presents engaging and interactive simulation-based content as and when required and ensures quality training of the learner. The scenarios in the package motivate the trainees for learning difficult concepts. (See Figure 3)

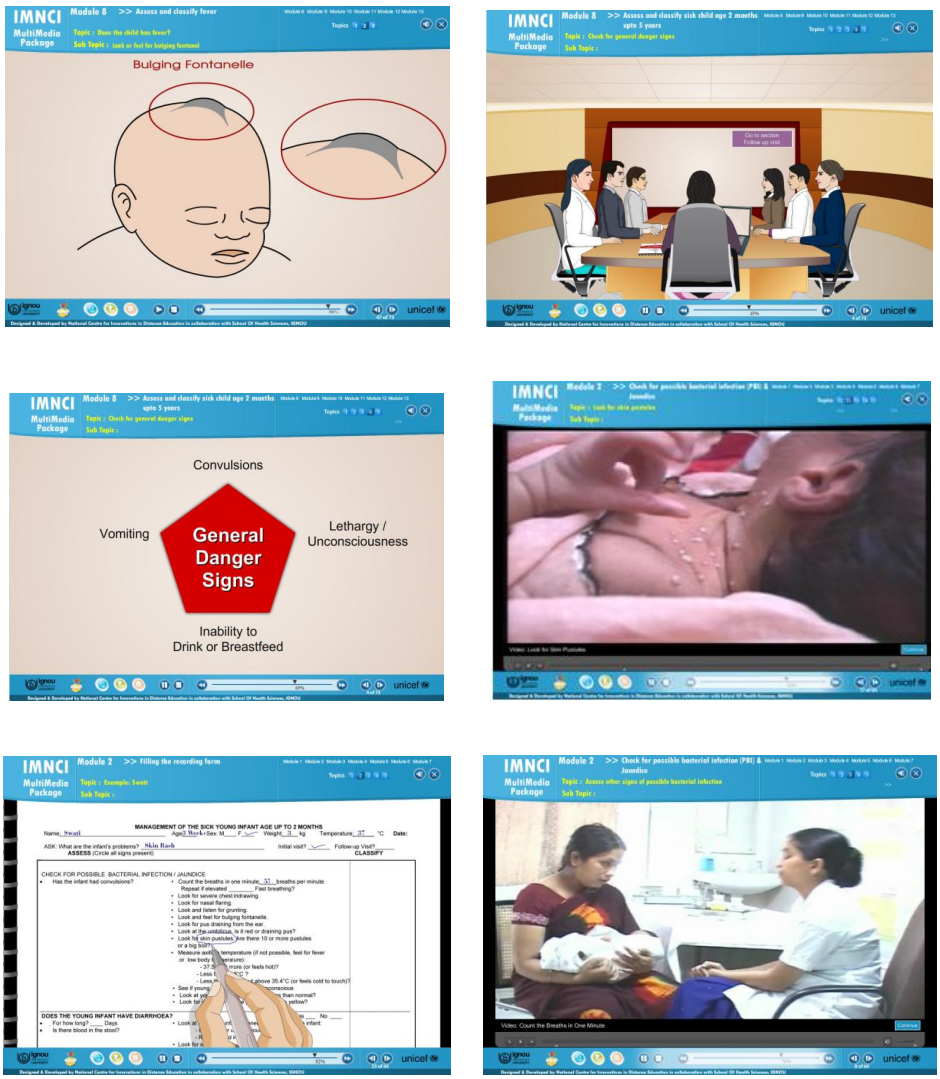


Figure 3 : Interactive Multimedia Enabled Learnlets

Each learnet also contains activities and give scope for self evaluation in the form of quizzes like Multiple Choice Quiz, Picture Quiz, Video Quiz, Filling Recording Forms, True/False Quiz, Fill in the Blank (Drag and Drop), Drag and Drop Quiz, Arranging Steps in Sequence, Yes/No Quiz, Case Analysis, Assessment, and Classification through Simulations, etc. As a sample see Figure 4.

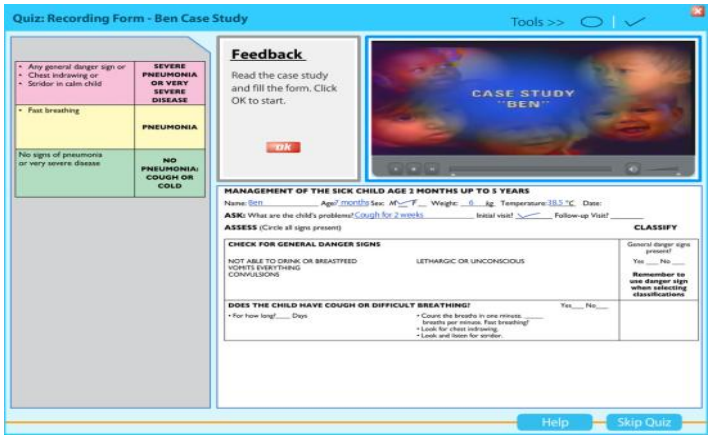


Figure 4 : Simulation Enabled Self Evaluation

c. **Resources :** This give access to various free software, articles, PowerPoint presentations, and video material for reference of the trainee.(See Figure 5)

Figure 5 : Resources Page

d. **Quiz-bank :** This component consists of random generation of questions for evaluating the learner (See Figure 6).

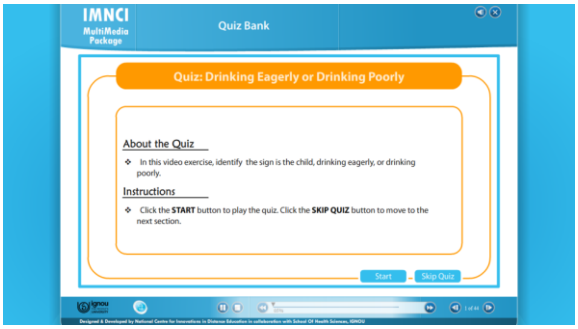


Figure 6 : Quiz Bank

e. **Chart Book :** Users can view chart book instantly. They can view other pages through clicking on the page numbers given on top right corner. (See Figure 7)

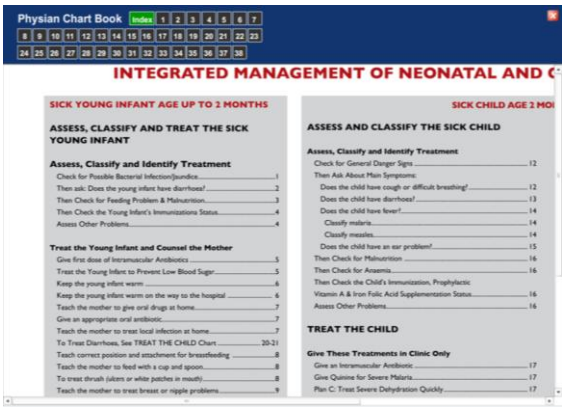


Figure 7 : Chart Book

f. **Glossary :** Users can access the glossary section. The glossary is an alphabetized collection of computer related terms with their meanings. (See Figure 8)

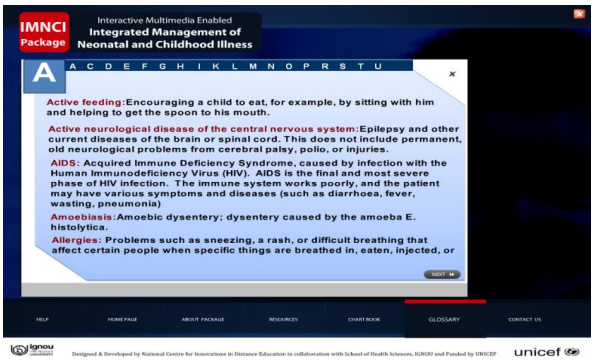


Figure 8 : Glossary

Innovative Features

The innovative features of the interactive multimedia enabled IMNCI package for health professionals are given below :

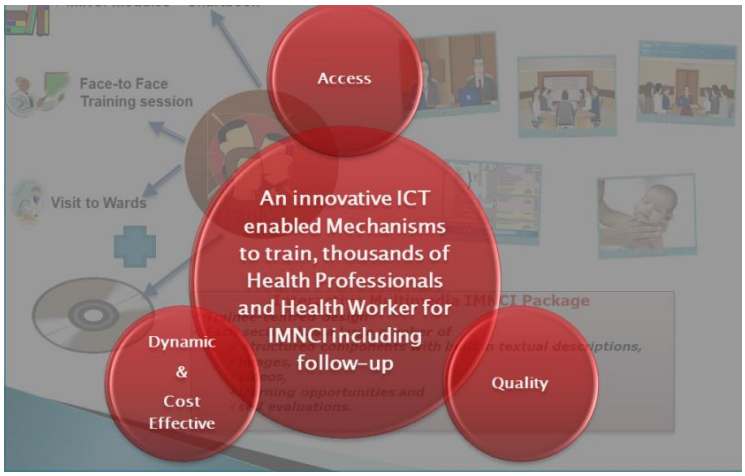
- It is a self learning package with a large number of structured components with built-in textual descriptions, images, videos, animations, learning scenario and self evaluations.
- Self-training and learning is inbuilt in the multimedia content which is, engaging and interactive, simulation-based and ensures that the trainees learn exactly what they need to learn.
- Each trainee has the same level of participation in the learning process. Participants are active rather than passive, and assume greater responsibility for their own learning.
- Trainees can obtain information and update or revise skills when they need them.
- This package caters to the need to train the doctors in IMNCI approach, re-orient the doctors trained in IMNCI and sensitize the health personnel about IMNCI.
- Trainees are provided instant feedback about their performances in order to stay motivated and involved.
- Trainees are active rather than passive, and assume greater responsibility for their own learning.
- Learning activities which are organized sequentially, have objectives that must be met before proceeding to the next component.
- Quality assurance and universality in respect of all health professionals involved in the care of children.
- It is dynamic and cost effective.
- The training is accessible through a trainee centric model.
- It is characterized by integrating the IMNCI training components (Except bedside teaching) into a pedagogically sound, technologically accessible digital package.
- It can be delivered both online and offline.
- It can be made available on other embedded systems like IPTv, android supported mobile phones, palmtops and tablets.
- The content is multimedia based where self-training and learning are inbuilt along with being engaging and interactive.
- The training is fully need based and handled by way of simulation technique.
- It is ensured that the level of participation of every trainee is same.
- Every trainee is an active participant during the process of training and thereby she/he assumes greater responsibility of self-learning.
- The trainees can update and revise their skills whenever they need.

- The conceptual framework of the IMNCI model enabled us to experiment and try new ideas as and when required by the stakeholders, thus enabling a quick adoption of it.

A product which is incompatible with the existing social and technological environment cannot be spread as rapidly as the one which is compatible. As in our case the health professionals even at the grassroots are fully aware of using computers and tabs for their day-to-day work hence the interactive multimedia package, is compatible to their social and technological environment making the IMNCI model rapidly being spread at the grassroots. Another fact that the IMNCI training is to be imparted to health professionals who are geographically distributed but have some essential similar attributes like their educational background is MBBS, so they are like individuals who share common meanings and beliefs, thus enabling the spread of the IMNCI training up to the grassroots effectively and with a high degree of rapidity.

Financial resources are cited as a constraint for Governments to scale up the IMNCI key health interventions in some countries including India. The technology enabled intervention has enabled conducting training for large scale of medical professionals in minimum time frame where the number of face-to-face training sessions is reduced from eight to two, which includes bed side teaching also. This has lead imparting of the training to be cost-effective.

For sustaining an innovation it is very import that it is flexible. An innovation which is not closed, i.e. an innovation system which is flexible enough to try new ideas, accommodate new technological interventions, simple, user friendly, and platform independent is generally sustainable than other complicated innovations. The conceptual framework of the IMNCI model enabled us to experiment and try new ideas as and when required by the stakeholders, thus enabling it to be sustainable.



Achievements

One of the biggest challenge was to make the IMNCI package accessible to all up to the grass root. In this context, through this package we have introduced a long-term innovative ICT enabled mechanism for providing a quality assured, dynamic, cost effective and accessible training through trainee centric pedagogic approach, and simple platform independent technology by replacing face-to-face training sessions with the interactive multimedia package except the bed side teaching component.Traditional barriers to facilitate new ideas and methods were worked out by getting the funds to develop the products from external agencies. The subject matter experts master trainers of the IMNCI

training were provided with working prototype of every script with animations so that the interactive multimedia content could be finalized.

Applications and Uses of the Innovation

The package can also be translated into other languages and could be easily used for Hindi speaking health personnel.

Pick up from the article.

Way Forward

The benefits of the IMNCI model using the interactive multimedia package for health professionals is perceived better than the exiting training model. This has attracted many health professionals, government organizations, state governments and central government who have approached to implement IMNCI training in their states.

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