Details of Module and its structure

Module Detail	
Subject Name	Education
Paper Name	Perspectives, Issues and Research in Teacher Education
Module Name/Title	Sustainable Development of the Learners without Eye Vision: the Case of Parmesh
Module Id	e-PGEDN 10.12
Pre-requisites	• Knowledge about the profiles of children with visual challenges and also that of without eye vision. • Knowledge about the problems faced by them.
Objectives	After going through this module the learners will be able to: • Identify the profile of the persons with visual challenges. • Employ various ways for sustainable development of the learners without eye vision. • Realise inclusive education for people with visual disablity. • Exercise measures for the placement of qualified visually disabled persons in teaching.
Keywords	case study, Job Access With Speech (JAWS), open book software, visual impairment, mobile facilitated talk back, technology devices, e-Braille, assistive technology

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1. Introduction

The present module presents the case of Parmesh- a dedicated educationist without eye vision. It presents how he has successfully completed M.A. (English Literature) and M.Ed. despite being Visually Challenged, how he could sustain his studies with social and technological support. The factors impeding his development have also been presented, along with his plight of overpowering those factors, his emerging profile as a healthy personality- a dynamic, balanced person with self-support, parent support, peer support, some school support, a little State Support. Though he has been employing Technologies such as, Job Access with Speech (JAWS), Open Book Software, Mobile facilitated Talk Back, and Braille, but, he is not yet been in a position to employ the latest technological devices. He has successfully completed his Education, but in terms of employment, the service sector at large has failed to seek his academic services. Technology has not yet been in a position to liberate him of the dependence on the Writers, which has been a limiting factor in his life. As his teachers have been feeling a lot for him, but, failed to act for him in providing teaching-learning material in the accessible e-form through latest available compatible technological devices.

2. The Case of Parmesh

Parmesh Solanki born on 31st January 1984 in Gujarat, India has completed M.A. English Literature and M.Ed. from the Maharaja Sayajirao University (MSU) of Baroda, Vadodara, Gujarat, India. He has been the MSU tudent both at M.A. & M.Ed. levels. During these programs he was found to be a very dedicated student, always keen on learning despite lack of eye vision, always insisting on e- learning material which could be utilized by him through packages like JAWS (Job Access With Speech). The teachers were always keen on providing him with e-learning material corresponding to various programs & courses. Also, his parents would read the text from the learning resources over late nights, so that he could be abreast with the course contents regularly.

After completing his B.Ed., when he tried his candidature for the position of English Language Teacher with the Parent Institution, his case was rejected under the pretext that

being without eye vision, he would not be in a position to conduct the various activities which the school demands, particularly, teaching and evaluation. It is surprising and shocking to learnt that how soullessly we disown our own quality product, even when, there is a national ethos of special education, integrated education and inclusive education. Not disheartened, this daring graduate tried for vertical mobility for M.Ed. with the specialization in Teacher Education, joyfully, fully and painstakingly. Then he tried for placement in School Education and Teacher Education, particularly, in the corporate private sector where again this sector failed to induct him as a teaching professional.

In order to sustain life and living, he joined a Call Centre at Ahmadabad, Gujarat, India as Consumer Care Executive (CCE), more than one year and daily from 10 a.m. to 6 p.m. with a salary of Rs. 4750 per month. Since the year 2015 he initially be joined as Assistant Professor in a Government B.Ed. College, Kachhal, Surat, Gujarat, India on contractual basis with a consolidated salary of Rs. 25,000/month.

3. **Most Impeding Factors**

- Reading disability without eye vision has been found to be the most impeding factor in the life of this dedicated scholar.
- Writer's availability from time to time has been found to be another limiting factor in his life. However, the support from the peers, teachers and parents and family and community members helped a lot to move ahead. There was full financial and emotional support from home.

4. **Technological Support**

During his studies and professional entourage Parmesh has got some technical assistance from the following:

a. **Facility with the JAWS:** He learnt JAWS which convert the e-text into audio form with Teerath at Tarsali very satisfactorily with nominal fees, because, Teerath has been providing support to the visually impaired with service motive.

b. **Open Book Software:** Another software package which he has found at ease with, is Open Book Software, because, here the contents in the hard copy are scanned by the Optical Character Reader (OCR) which can be read by the OBS, converting it from the text to the audio stimuli.

c. **Talk Back:** Parmesh has also been working with another software, namely, Talk Back, which is a screen reading software inbuilt in the mobiles. The syntax is as follows:

- Setting
- Accessibility
- Talk Back
- Click
- Install

d. **E-braille:** He has been using braille for the last 12 years, but, there is a question of accessibility with respect to the software converting & printing the text into the braille form. Moreover, it is not economically viable, because, 500 pages of hard text are converted into 3000 pages of the braille text.

5. Life Satisfaction

Parmesh is a man of literature. Every bit of his text has its own testimony. He observes decency, decorum and discipline in every act of life. He is a humane & dedicated personality who has been very gracefully struggling without Eye Vision, with a mental kick & motor muscle momentum to move dynamically in every facet of life – personal, social or workplace. His students are all satisfied with his scholarship, simple living & high thinking. He is deeply rooted into the Indian Culture.

Parmesh has a very sound family background. His father has been the administrative staff of the MSU. Parents are fully caring. Now he is looking for a life partner who has to be understanding and without a visually challenged. He does not aspire for a partner with lots of degrees, but likes to seek happiness with the humanistic grace, and native culture. He is of the

view that he would never disappoint his life partner on any fore, rather than try to seek suitable appointments for her. He is in quest of both, emotional satisfaction along with professional satisfaction. He is hopeful of a meaningful, healthy and resonating life.

6. Assistive Devices for the Sustainable Development of the Visually Challenged and Low Vision students

Assistive technology may be organized into a system of low-tech and high-tech tools and strategies that match a person's needs, abilities and tasks. Learners/ teachers/parents pick and choose from the system the appropriate tools for the situation.

- **Low Technological Devices:** These refer to unsophisticated devices and largely non-electronic devices, such as: hearing aids, speech trainers, braille paper and styli, tape recorders, and magnifying reading glasses, Hard copies of notes provided by the instructor or other student, outlines, double spaced, with keywords provided by the teacher or note taker, Printed materials double-spaced and with larger print, calculators with voice synthesizer and books on tape.

- **High Technological Devices:** These devices involve the use of sophisticated communication and environmental control systems that are electronically based. Here the focus is on increasing variety of methods of adapting the computer through the use of special needs peripherals and/or software, such as, Lap top computer for note taking, Electronic spelling masters or dictionary with voice output, Word prediction software, Outline software, Reading and scanning software and Voice recognition software.

  Let us discuss about few of the assistive software/technology devices which can be used by the visually impaired or low eye vision people:

- **Language Software for Visually Impaired:** The Indian Institute of Technology (IIT) Chennai has developed braille Software as well as Language Software which enables a visually impaired person to access computers for braille as well as language outputs in all the Indian languages. The Vidya Vriksha Training Centre for the Disabled, a Chennai based NGO is imparting training to visually impaired persons in the use of

software. It is also providing the software completely free of cost to the users and the institutions. It has also developed a system of keyboard mapping and operations in Indian languages and instruction manual for use of the special version of the ITI Multilingual Software.

- **Screen Readers:** These are used to verbalize, or "speak," everything on the screen including text, graphics, control buttons, and menus into a computerized voice that is spoken aloud. In short, a screen reader transforms a Graphic User Interface (GUI) into an audio interface. Screen readers are most useful for visually impaired computer users.

- **Speech Recognition or Voice Recognition Programs:** These systems allow people to give commands and enter data using their voices rather than a mouse or keyboard. Voice recognition systems use a microphone attached to the computer, which can be used to create text documents such as letters or e-mail messages, browsing the Internet, and navigating among applications and menus by voice.

- **Screen Enlargers, or Screen Magnifiers:** This system is very useful for the people with low or very poor vision; it works like a magnifying glass for the computer by enlarging a portion of the screen which can increase legibility and make it easier to see items on the computer. Some screen enlargers allow a person to zoom in and out on a particular area of the screen.

- **Braille Embossers:** With the use of Braille Embossers students can transfer computer generated text into embossed braille output. In this system braille translation programs convert text scanned-in or generated via standard word processing programs into braille, which can be printed on the embosser.

- **Refreshable Braille Displays:** Through this software students are provided with tactile output of information represented on the computer screen. The user reads the

braille letters with his or her fingers, and then, after a line is read, can refresh the display to read the next line.

- **Text-To-Speech (TTS) or Speech Synthesizers:** These software receive information going to the screen in the form of letters, numbers, and punctuation marks, and then "speak" it out loud in a computerized voice. The use of speech synthesizers allows computer users (who are visually impaired or who have learning difficulties) to hear what they are typing and also provide a spoken voice for individuals who cannot communicate orally, but can communicate their thoughts through typing.

- **Talking and Large-print Word Processors:** These processors are very useful for the people with low or very poor vision; they are software programs that use speech synthesizers to provide auditory feedback of what is being typed. These are-print word processors allow the user to view everything in large text without added screen enlargement.

- **DAISY (Digital Accessible Information System):** This is a technical standard for digital audiobooks, periodicals and computerized text. DAISY is designed to be a complete audio substitute for print material and is specifically designed for use by people with "print disabilities", including blindness, impaired vision, and dyslexia. Based on the MP3 and XML formats, the DAISY format has advanced features in addition to those of a traditional audio book. Users can search, place bookmarks, precisely navigate line by line, and regulate the speaking speed without distortion.

- **Non-Visual Desktop Access (NVDA):** This open source software enables visually challenged people to use a computer by communicating what is on the screen using a synthetic voice or braille. It is the only screen reader for Microsoft Windows that is totally free, yet fully functional and portable. Students can download it to their PC, or to portable media such as a USB stick which they can use with any computer at school, work, etc.

- **Braille Slate:** A wooden board with holes on either sides, metal guide is fitted with these holes and brought down a writing progresses. Each cell in the guide has six notches representing six dots in braille. On the top there is a clamp with the pins to hold the paper in position. This is the simplest appliance used for writing braille (Figure 1).
  - Interline braille Frame,
  - Taylor Postcard Frame
  - Pocket braille Frame

- **Stylus:** These are produced with handles of various shapes to suit individual needs. The points of all stylii are made of stainless steel and the handles are of polished hardwood or synthetic material (Figure 1).

Figure 1: Slate and Stylus

Source: https://upload.wikimedia.org/wikipedia/commons/8/89/Slate_and_Stylus_2.jpg

- **Taylor Arithmetic Frame and Arithmetic and Algebra Type (Metal):** The surface of this aluminum frame is divided into star shaped holes with eight angles, thus allowing the double-ended metal types to be placed in different positions according to a set system.

- **Abacus:** A simple instrument for performing rapid arithmetical calculations. It consists of a frame holding thirteen vertically arranged rods on which beads slide up and down. The beam supporting the beads is marked with a raised dot at each rod position and a raised bar between every third rod. The bars serve to indicate the decimal point and other units of decimal measure (Figure 2).

Figure 2: Abacus

Source: https://upload.wikimedia.org/wikipedia/commons/2/27/Chinese-abacus.jpg

- **Braille Board:** It is a favourite braille learning tools for kids. It is made of 3 rows and 10 cells and is accompanied by 180 metal pegs to make different words or sentences.
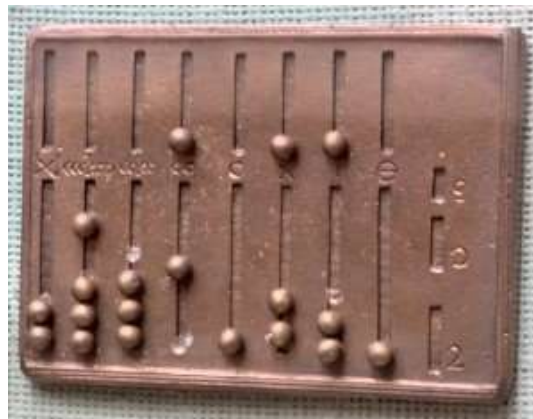

Figure 3: Braille Board

Source: https://upload.wikimedia.org/wikipedia/commons/b/b5/RomanAbacusRecon.jpg

- **Letter Cube:** A little cube help the child learn braille in a very exciting way. It's a three sectioned rectangular cube which can be rotated to form any letter.

- **Word Forming Block:** A plastic piece of block to make children learn 5 or 8 letter words.

- **Alphabet Trainer Plate:** It's a made up of a plastic plate which has braille letters embossed and the English letters are engraved (Figure 4).
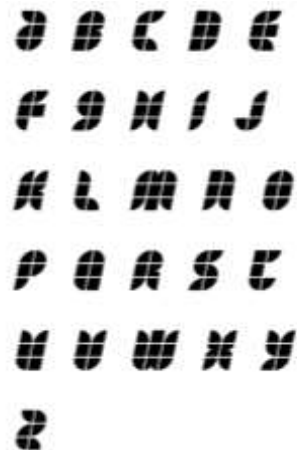
Figure 4: Alphabet Trainer Plate

Source: http://www.publicdomainpictures.net/pictures/50000/velka/broken-alphabet.jpg

- **Word Building Kit:** This kit has 60 plastic pieces of alphabets in braille and in English that can be interlocked to form words (Figure 5).

Figure 5: Word building kit   Source:

http://maxpixel.freegreatpicture.com/static/photo/1x/Numbers-Words-Scrabble-620665.jpg

- **Geometry Kit:** This kit has set of 30º & 45º Set squares, Compass, Scale-30 cms, Protractor and other instruments that can be used for studies (Figure 6).

Figure 6: Geometry kit

- **Brailler:** It is an upward writing machine for writing on one side of the paper, enabling the braille to be read as it is written, it has nine keys, three for paper setting and six for embossing, the brailler embosses combinations of six dots in a braille cell. The braille machine is made of metal with an enamel finish, with plastic key-tops and adjustable margin stops. The paper is roller-fed and line spacing is achieved by pressing a special key (Figure 7).

Figure 7: Brailler

Source:

https://upload.wikimedia.org/wikipedia/commons/d/d9/Perkins_SMART_brailler.jpg

- **Braille Duplicators:** Thermoform Machine semi-automatic braille duplicating machine. It is useful for taking out multiple copies of the braille matter on the Indutherm sheets from the master generally prepared on the braille paper. This machine operates on the principle of vacuum and high temperature (Figure 8).

Figure 8: Braille duplicators

- **OPTACON Reading Machine**

The OPTACON is an electromechanical device that enables blind users to read printed material that has not been transcribed into braille. It consists of a camera lens connected to a main electronics unit that contains a "tactile array" that consists of vibrating rods that users feel with their index finger. Printed text is, essentially, translated into tactile vibrating images (Figure 9).

Figure 9: OPTACON Reading Machine

Source: https://upload.wikimedia.org/wikipedia/commons/7/72/Optacon.jpg

- **Kurzweil Reading Machine:** The Kurzweil Reading Machine converts print to speech, and is designed as a reading prosthetic aid for the blind and visually handicapped. The system handles ordinary printed material—books, letters, reports, memoranda, etc. In most common styles and sizes of type. The output produced is a synthetic voice using full-word English speech (Figure 10).

Figure 10: Kurzweil reading machine

- **Electronic braille Note Taker:** Small, portable devices with braille keyboards for entering information. They use a speech synthesizer or braille display for output (Figure 11).

Figure 11: Electronic braille note taker

- **Braille Display Technology:** These devices operate by raising and lowering different combinations of pins electronically to produce in braille what appears on a portion of the computer screen (Figure 12).

Figure 12: Braille Display Technology

Source:

https://upload.wikimedia.org/wikipedia/commons/thumb/e/e5/Brno,_Universal_Learning_Design,_Braille_laptop_2.JPG/189px-Brno,_Universal_Learning_Design,_Braille_laptop_2.JPG

- **Stand Alone Scanners:** These are all-in-one 3D printers with integrated computer touchscreens and 3D scanners (Figure 13).

Figure 13: All-in-one 3D   Printer and
3Dscanner, Source:

https://upload.wikimedia.org/wikipedia/commons/4/4e/ZEUS_3D_Printer.png

- **Video Magnifiers:** Video magnifier or closed-circuit television (CCTV) system uses a stand-mounted or handheld video camera to project a magnified image onto a video monitor, a television (TV) screen, or a computer monitor.

- **Braille Printers:** After being sent information to be brailled from computer devices, braille printers do the actual embossing of braille onto paper. Both one-sided and two-sided Braille printers.

- **Magnification Software:** There are several magnification software like Zoom Text, Magic, Lunar, etc. which help in magnifying content.

- **Screen Access Software:** Cobra, Guide, JAWS, Supernova Screen Reader, System Access, Talking Toolbox, Voice over, Window-Eye Pro are few of the screen Access software.

- **Braille Translation Software:** Braille 2000, Duxbury braille Translator, MegaDots, Viewplus braille Translator, Winbraille

- **Mobility Devices:** Those Devices which helps/aids an individual to move from one place to another safely, securely, independently and gracefully, such as, Long Cane, Folding Cane, Laser Cane.

- **Long Cane & Folding Cane:** It is made up of aluminum tubing of 12 mm outer diameter and is 90 cm long. It has a grip at the top and a nylon tip at the bottom, so that it does not slip. Long cane is used by adults. A variety of cane tips are available.

- **Laser Cane:** This is an electronic cane that uses invisible laser beams to detect obstacles, drop offs, and similar hazards in the surroundings. Once the cane detects the obstacle or drop off using the laser beams, it will produce a specific audio signal. The cane has three distinct audio signals; each one indicates a specific distance. The audio signal informs the user of the distance of the obstacle or the height of the drop off. This device can detect objects and hazards up to a distance of 12 feet. A part of the cane's handle also vibrates when there is an object in front of the user (Figure 14).

Figure 14: Laser cane

- **Electronic Travel Devices**

Laser Cane, Ultrasonic Torch, Sonic Guide (Figure 15), Light probe, Mini Beeper, Lindsay Russel E-Model Path founder, etc. are few of the electronic travel devices which are very helpful for the visually challenged.

Figure 15: Sonic Guide

- **Mobility Show Card:** A plastic show card to help Visually impaired persons to cross busy roads and to hail a taxi.

- **Daily Living Devices for visually impaired:** Clocks and watches, Games and Puzzles, Sports, Kitchen Equipment, Personal Devices.

- **ScripTalk Station:** This device helps to scan and read the small print and look-alike packaging of medicine vials can lead to confusion, non-compliance, and mistakes.

- **Some other free solutions for visually challenged or low vision students:** Few of the other free software based solutions for the visually challenged or low vision students include Fire Vox, CLC STAR, iZoom Web, System Access to go, etc.

7. **Devices for Assisting in Receiving and Responding**
   a. The TLM should be provided in the e-form/ digital format.
   b. Screen Reader for recording aloud the text format and picture description narration.
   c. Audio Recording
      o Basic phone
      o Smart phone
      o Stand alone sound recorder
   d. Devices for recording the responses in examination hall.
      o The audio message given by the examinee can be captured by a LMS/Exam system as it is in audio form which can be later evaluated by an evaluator.
      o The audio signals can be converted into the digital text form by LMS/ ES.
      o In addition the audio responses can be registered and automatically converted into a digital format by detecting the segments given by the candidate in an interactive 3D virtual reality system.

8. **Concluding Status of Parmesh on Sustainable Development**

   a. Parmesh is a healthy personality- a dynamic, balanced person with self support, parent support, peer support, some school support, a little State Support.

   b. Though he has been employing Technology- JAWS, Open Book Software, Mobile facilitated Talk Back, and braille, but, he is not yet been in a position to employ the latest technological devices.

   c. He has successfully completed his Education- M.A. (English Literature) & M.Ed.

   d. As far as employment of Parmesh in the service sector is concerned, the service sector at large has failed to seek his academic services.

   e. Technology has not yet been in a position to liberate him of the dependence on the Writers, which has been a limiting factor in his life. As his teachers we have been feeling a lot for him, but, failed to act for him in providing teaching-learning material in the e-form, latest available compatible technological devices.

9. **Conclusion**

We talk a lot of special education, integrated education, inclusive education, education of the disadvantaged groups & their sustainable development, but, there are wide gaps between our feelings and action. We have ANUBHOOTI but not ANUPRANIT. Feeling without action for a while is futile. Technology without application is useless. The natural miseries though Meta cognition are the subject of every heart & soul. Sustaining every entity in sound health is the concern of Education. Same holds true in the case of Parmesh!