

CHAPTER 3
METHODOLOGY

CHAPTER - 3

METHODOLOGY

The present study aimed at **“Designing and Developing Accessible Digital Media in Video-Format on Comprehension of Basics of Entrepreneurship for the Deaf”**. The study was conducted using an experimental design in the academic year 2021-24. Pre-post experimental research design was used to conduct the research. The present chapter describes the methodology used in the study. These were as follows:

3.1 Part 1: Feasibility Study

3.2 Part 2: Designing & Development of the Modules on “Basics of Entrepreneurship” for Deaf

3.3 Part 3: Experiment of Modules on Accessible Digital Media in Video Format on “Basics of Entrepreneurship for Deaf”

- Construction of the Research Tool
- Validation of the Research Tool
- Ethical Clearance
- Experimental Phase
- Scoring and Categorization of the Data
- Plan of Statistical Analysis

3.1 Part 1: Feasibility Study

A feasibility study refers to checking the possibility, viability, practicability, and probability of the research subject. The present feasibility study adopted a certain direction and willingness to carry out the lengthy and arduous research work process. In addition, it provided an insight into practical and ethical aspects, i.e., administrative structure, seeking permissions, sample availability and willingness, relevancy and effectiveness of the tools executed, methodology, etc.

3.1.2 Phase I – Objectives of the Feasibility Study

3.1.2.1.1 To understand the means of livelihood of the selected deaf respondents.

3.1.2.1.2 To understand the employment status of the selected deaf respondents.

3.1.2.2 To study the awareness level of the selected deaf respondents about special employment exchange under RPWD Act.

3.1.2.3 To study the Deaf person's expectations from government agencies regarding their livelihood.

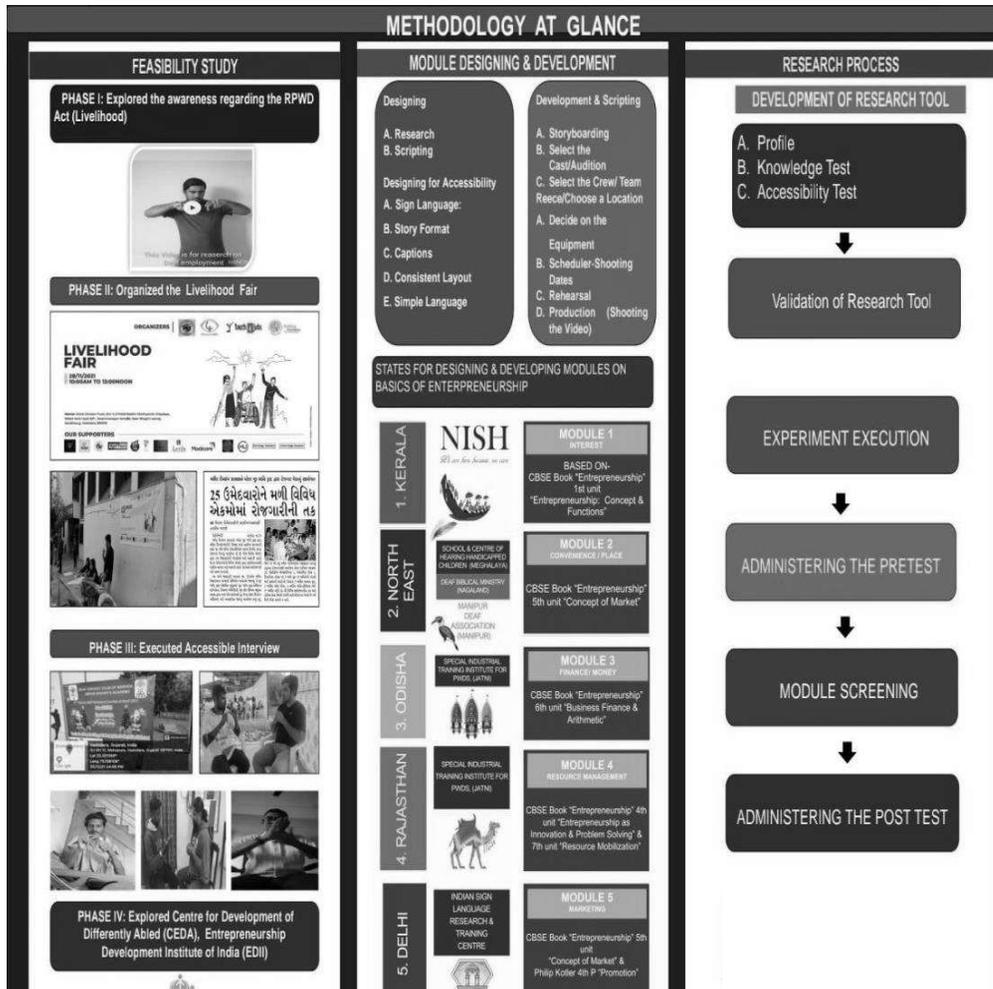


Figure 3 Methodology at Glance

3.1.3 Phase I – Objectives of the Feasibility Study

3.1.3.1 To understand the means of livelihood of the selected deaf respondents.

3.1.3.2 To understand the employment status of the selected deaf respondents.

3.1.3.3 To study the awareness level of the selected deaf respondents about special employment exchange under RPWD Act.

3.1.3.4 To study the Deaf person's expectations from government agencies regarding their livelihood.

3.1.4 Population of the Feasibility Study: The population studied were eligible employable deaf persons of the Vadodara District.

3.1.4.1 Sample & Sampling Technique used for the Feasibility Study: Sample is the total quantity of the things or cases and were the subject of this research. Sample is part of the universe or population (Tailor, 2005). The study of comprehension of sign language by the deaf was undertaken based on nonprobability sampling, as

randomization is unimportant in selecting a sample from the population of interest, while the study was about the deaf and their comprehension. Hence, non-probability sampling techniques were appropriated for this study, where the population was clearly defined, i.e., the deaf population. This study attempted to understand the subject matter's awareness and comprehension in sign language of the special employment exchange under the RPWD Act regarding employment and livelihood, therefore a sample of 96 deaf respondents were selected through the convenient sampling technique. The study required denoting the population eligible for employment, readily accessible, in close geographical proximity, available at any given time, with a willingness to participate; included in the purpose of the study.

3.1.5 Procedure of Feasibility Study

To understand the issues faced by the deaf community regarding employment, and to gauge their awareness about the RPWD Act and its comprehension in sign language, the following procedure was adopted:

3.1.5.1 Partnership with Local NGO: Partnered with the Vadodara-based NGO, Astitva Foundation, to initiate interactions with the deaf community about employment issues.

3.1.5.2 Questionnaire Development: A nine-question survey was designed to gather personal information, disability details, awareness of special employment exchanges, and livelihood insights. To ensure accessibility, the questionnaire was recorded in sign language on video for easy distribution. An English script was developed, and a native deaf individual was chosen to present the questions on camera. The video was then edited using the mobile app "In Shot" for final production.

3.1.5.3 Validation: Before distribution, the video underwent validation by experts including Mr. Sunil Saharabudhe, President of the All India Federation of the Deaf; two well-known interpreters, Ms. Kinjal Shah from Mumbai and Ms. Trushna from Vadodara; along with Ms. Rashmi Mehta, Principal of GD Patel Senior and Secondary Deaf School under the Mook Dhvani Trust. Their feedback, especially regarding regional variations in sign language, was incorporated.

3.1.5.4 Distribution: The video was sent to 96 deaf individuals through WhatsApp, but no responses were received. Several factors contributed to this outcome, such as the way deaf individuals primarily process information visually, challenges in

retaining content, the absence of an internal voice, and difficulties in seeking assistance from family members due to communication barriers.

3.1.5.5 Personal Interaction: It was determined that face-to-face interactions were necessary to gather responses. A livelihood fair, specifically for the deaf was planned to draw the respondents to a single location for the study.

3.1.6 Challenges Faced in Feasibility Study

3.1.6.1 The study faced hurdles due to COVID-19 restrictions.

3.1.6.2 Deaf community mobility issues during the pandemic made participation challenging.

Thus, the feasibility study, though impeded due to unforeseen circumstances, continued to aim to understand the unique challenges and awareness levels of the deaf community in Vadodara regarding employment.

- It was noted that deaf persons primarily process information visually and often struggle with memorization.
- Instead of an inner voice, the deaf rely on sign language, their first language, and tend to think in signs, having what might be termed an “inner sign”.
- Upon receiving a video message on their phone, the deaf individuals were unable to respond due to difficulty in memorization
- Seeking assistance from family was not always effective, since family members only grasp some basics of sign language, primarily using gestures to communicate with the deaf.
- The most effective responses were through direct face-to-face interviews conducted with them.
- The deaf community spread throughout the city made individual visits challenging, further complicated by their schedules.
- Gathering all deaf individuals at a single location was considered the best resolution.

Consequently, a livelihood fair was set-up to ensure their presence at a designated location and time.

3.1.7 Phase II – Organization of the Livelihood Fair for the Deaf in Vadodara

3.1.7.1 Objective: To facilitate employment opportunities for the deaf community in Vadodara and gather insights for a feasibility study (Phase - I).

3.1.7.2 Steps Involved:

3.1.7.2.1 Collaboration Initiatives: Collaborated with the Vadodara-based NGO Astitva Foundation, along with Youth For Jobs and Piramal Glass Products, to offer 100 job opportunities. Additionally, I partnered with 10 local organizations in Vadodara, spanning industries like manufacturing, retail, and food & beverages. I also facilitated five self-employment ventures in areas such as scent-stick production, pizza outlets, bakeries, and multi-level marketing.

3.1.7.2.2 Venue Selection: The fair was hosted at Mook Dhvani Trust's GD Patel Senior Secondary Deaf School.

3.1.7.2.3 Support and Logistics: Sign language interpreters were engaged to ensure effective communication during the interviews. Refreshments were made available for all participants, and the press was invited for coverage. Prominent local newspapers, including Sandesh Press, Gujarat Samachar, and Divya Bhaskar, featured the event in their publications.

3.1.7.2.4 Team Formation and Training: A volunteer team of 13 members, made up of graduate and post-graduate students from The Maharaja Sayajirao University of Baroda, had been formed. The group received orientation at the Department of Extension & Communication to equip them with the skills necessary for effectively coordinating with the deaf participants during the interviews.

3.1.7.2.5 Participation: 92 job seekers from Vadodara and its surrounding regions attended the fair.

3.1.8 Outcomes of Livelihood Fair

3.1.8.1 Employment Achieved: Of the 92 job seekers who attended the fair, 27 (or 29.34%) were successful in securing job opportunities.

3.1.8.2 Feasibility Study Insights: The livelihood fair primarily aimed to conduct a feasibility study, selecting a sample of 72 participants from a total of 92 to collect sufficient responses. However, a troubling finding emerged when only 4 out of the 72 participants responded accurately. This highlighted the significant challenges faced by the deaf community in reading comprehension, revealing deeper issues within deaf education in Vadodara and the nearby regions

3.1.8.3 Educational Status of Participants: A total of 34% of the individuals had finished their 12th class, while 38% had completed the 10th class. Meanwhile, 28% had not successfully passed the 8th standard.

3.1.8.4 Adjustments Made Post Feasibility Study: In light of the challenges encountered during the feasibility study, the approach was adjusted to improve its effectiveness. The revised methodology focused on conducting individual interviews to enhance communication clarity. A sign language- proficient interviewer was engaged with the deaf participants, aiming to gain a more thorough understanding of their viewpoints. This adjustment highlighted both the importance of the study and the obstacles faced.

3.1.9 Modified Study:

3.1.9.1 Procedure Adopted for the Modified Study:

- **Reassessment Due to Unmet Outcomes:** The study was re-evaluated and modified after the initial outcomes did not align with expectations.
- **Challenges in Gathering Respondents:** Securing the participation of deaf respondents proved to be a challenge, leading to a reduction in the number of interviewees. Initially planned to interview 72 individuals, the number was scaled down to 30 due to the difficulties in re- interviewing all the participants.
- **Venue for the Modified Study:** An opportunistic approach was taken by utilizing a deaf cricket tournament hosted by the Deaf Cricket Club of Baroda. This event provided access to 13 participants who had been interviewed earlier during the Livelihood Fair.
- **Further Data Collection:** The remaining 17 participants needed personal interviews. Following the Livelihood Fair, various methods were employed, such as home and workplace visits, along with collecting video interviews through WhatsApp. This process proved to be time- consuming, lasting over two months, primarily due to challenges with non-responsiveness and participants' availability. Persistent efforts were made, which included engaging the respondents' family and friends and maintaining contact with them even during travels to successfully gather the interviews.
- **Data Conversion and Verification:** Initially, all data presented in sign language was transcribed into text. A certified sign language interpreter subsequently verified the transcription to ensure its accuracy.
- **Maintaining the Deaf Perspective:** In the study, authenticity and true representation were prioritized by focusing on the perspective of the deaf community. The questions were developed by deaf individuals themselves, and both

signing and interpretation from sign language to text were carried out by native deaf individuals from Gujarat, which ensured a genuine reflection of their experiences and viewpoints. The investigator demonstrated a meticulous approach by making necessary modifications to the study procedures, addressing the challenges encountered and taking measures to ensure a comprehensive understanding from the deaf community's perspective in Gujarat.

3.1.10 Phase III- Findings of The Feasibility Study

3.1.10.1 Feasibility Study Findings: A Summary

The feasibility study explored various dimensions of the deaf community's comprehension and awareness levels about their personal information, employment, and rights. Following findings emerged:

- **Reading and Comprehension Abilities:** Approximately 20% of respondents, despite completing the 8th grade, were unable to read or write basic information about themselves. This concerning statistic can be attributed to the educational approaches in special schools for the deaf, where sign language was not given priority. Instead, these schools adopted a method known as total communication, which emphasized a combination of oral speech, lip reading, and visual aids, rather than focusing on sign language as a primary mode of instruction. The emphasis in these schools seemed to be more on increasing enrollment numbers rather than ensuring that deaf students received a comprehensive education that catered to their unique needs. As a result, many students struggled with fundamental literacy skills. This highlights the urgent need to introduce sign language at the elementary level, as it could significantly enhance the comprehension and educational outcomes for deaf students, helping them better understand and engage with the curriculum.
- **Employment and Expense Management:** A significant 43.3% of respondents were able to share information about their employment status and how they manage their expenses. However, this percentage reflects a deeper issue rooted in the lack of comprehension of Gujarati and English language materials. Many deaf individuals struggle to fully understand these languages, which limits their ability to navigate important aspects of life, including employment. This language barrier has contributed to the underachievement of initiatives like the 'Accessible India Campaign 2015,' which, despite its intentions, has not delivered the expected

positive outcomes for the deaf community. Without materials and resources in formats that are accessible and comprehensible to the deaf, such campaigns fail to meet their full potential, leaving many in the community without the support they need to thrive.

- **Awareness about Rights:** None of the respondents were aware of the RPWD Act 2016 or the special employment exchange for persons with disabilities (PWD), highlighting a significant gap in their access to vital information. This lack of awareness underscores the urgent need to improve how essential information is communicated to the deaf community. The absence of knowledge about such important policies and opportunities is largely due to the failure to deliver information in a format they can easily understand, such as sign language. This communication gap has motivated further study, emphasizing the critical importance of providing information in sign language to ensure the deaf community is informed and empowered to access the rights and services available to them.

3.1.11 Outcomes of the Modified Study after Using Sign Language:

- **Personal Information Comprehension:** When asked in sign language, all respondents were able to answer basic questions about their name, education, and disability. Of the respondents, 26% were employed and managed their expenses independently, while the remaining 74% relied on family and relatives for financial support. Despite this, all respondents, when questioned in sign language, expressed significant challenges in finding employment, highlighting the barriers they face in accessing job opportunities. This outcome stressed the need for more comprehensive communication methods, such as sign language, to improve the deaf community's access to employment information.
- **RPWD Act Awareness:** Only one respondent was aware of the RPWD ACT 2016. This implied the necessity of communicating crucial rights and provisions in sign language to ensure that the deaf community is informed and empowered.

After finishing the feasibility study, it became evident that gathering the deaf community in one location without an event is challenging. A follow-up revealed that several deaf individuals who found employment through the Livelihood Fair left their jobs within a few months. The reasons for leaving their jobs as follows:

- The respondents shared that they often felt excluded from daily organizational communications, which led to feelings of demotivation and invisibility within the workplace. They also experienced job discrimination, with many being assigned tasks that were outside of their job profiles.
- Additionally, they were compensated unfairly compared to their peers, further deepening their sense of inequity. These combined factors ultimately caused them to resign from their positions.

This cycle affected their performance and perpetuated negative stereotypes, rendering them financially vulnerable and reliant on their families. They often settled for lower-paying, less dignified jobs, reinforcing the stereotype that deaf individuals are inferior and deserve less. This cycle needs urgent interruption, especially given the global emphasis on inclusivity.

Although the RPWD Act 2016 and SDGs Goal 8 promote equal opportunities for all disabled individuals, their implementation seems symbolic rather than sincere, shifting from a rights-based approach to charity-driven efforts.

3.1.12 Phase IV: The Centre of Empowerment of the Differently Abled (CEDA)

In Phase IV, the researcher visited the Centre of Empowerment of the Differently Abled (CEDA) at the Entrepreneurship Development Institute of India (EDII) in Gandhinagar. Sponsored by the Social Justice of Empowerment Department and the Gujarat State Handicapped (Divyang) Finance & Development Corporation, the center primarily catered to individuals with physical disabilities and the visually impaired, while the deaf community remained largely overlooked. This exclusion was attributed to the absence of accessible training modules personalized for the deaf.

- **The Findings Emphasized Two Immediate Needs:** There is a pressing need to emphasize entrepreneurial opportunities tailored for the deaf community. This includes the development of educational modules on entrepreneurship that incorporate sign language, ensuring better comprehension. Additionally, integrating digital captioning will enhance accessibility and affordability, making these resources more inclusive and effective for deaf individuals looking to pursue entrepreneurial ventures.

Addressing the above needs may rectify the challenges identified during the feasibility study. The proposed accessible educational modules aim for genuine inclusion, promoting dignity and independence for the deaf community in society's mainstream.

Therefore, a comprehensive study of the deaf population throughout selected states of India not only will provide insight into the complexities and challenges faced by the deaf community but also may present a roadmap for progress in the socioeconomic inclusion agenda. The investigator, with over a decade of expertise in deaf studies, spearheaded this nationwide research. Given India's extensive diversity, these in-depth findings are of immense importance. Vadodara is home to thousands within the deaf community. While they maintain their distinct culture, they also grapple with issues related to healthcare, education, and economic engagement. Despite the unique challenges they face, one standout observation was the minimal entrepreneurial participation of the deaf. Hence, the study seeks to address this area of concern.

It facilitated the investigator to **“Design & Develop modules for the Deaf on the Basics of Entrepreneurship using the investigator's experience in creating digital educational content tailored for the deaf in today's tech-driven classroom setting”**.

3.2 Part 2: Designing & Development of the Modules on “Basics of Entrepreneurship” for Deaf

- **Criteria for selection of the Institutes:** Higher education for the deaf in India has progressed at a slower pace due to a combination of factors. Predominantly, a lack of accessible relevantly skilled persons and infrastructure, such as sign language interpreters in educational institutions, which hinders effective learning. Additionally, societal attitudes and misconceptions about the abilities of deaf individuals lead to reduced opportunities and support. The scarcity of specialized training for educators catering to deaf students and limited resources dedicated to the creation of an inclusive curriculum further exacerbated the challenges. Many deaf students in India faced barriers that prevented access and growth in higher education environments due to scarce specialized higher educational institutes. A targeted initiative was then launched across India to delve into higher educational aspirations and entrepreneurial inclinations of the deaf community. Thus, the following Institutes of Deaf were selected for the present study:

Table 1: Institutes Selected for Conducting Research Study on Modules of Basics of Entrepreneurship for Deaf

NAME OF THE INSTITUTE	PLACE OF DESIGNING & TESTING THE MODULE
NISH The National Institute of Speech & Hearing School & Centre of Hearing Handicapped Children	Kerala
Deaf Biblical Ministry in Dimapur Govt Deaf and Mute School & Manipur Deaf Association Imphal	North East
Special Industrial Training Institute for PWDs, Jatni	Odisha
Government Deaf College	Rajasthan
Indian Sign Language Research & Training Centre	New Delhi

It was planned to develop the modules on ‘Basics of Entrepreneurship’, for the above-mentioned various prestigious institutions for Deaf across the selected states of country.

3.2.1.1 NISH: The National Institute of Speech & Hearing, Kerala

The National Institute of Speech & Hearing situated in Thiruvananthapuram, Kerala, is a pioneer in providing higher education programs in Indian Sign Language. This institute was approached to explore post-graduate aspirations. NISH's past endeavors significantly improved the lives of

those with disabilities, particularly the hearing impaired. Their commitment to impactful research in the disability and rehabilitation sectors made them an apt choice for collaboration.

The investigator applied for an internship at NISH, which, after a successful telephonic interview, entailed a range of daily tasks. These varied from observing teaching methodologies to early childhood interventions and skill training programs. A daily log was maintained, culminating in a presentation on choosing between conventional employment and entrepreneurship.

Post-internship, the investigator sought permission for a more in-depth study from NISH's Review Authority for Research (RAR). Adherence to strict ethical guidelines and a standardized format, aligning with the American Psychological Association's

seventh edition, was mandatory. Research proposals had to include various components, from title and objective to methodology and results, and even informed consent forms in multiple languages. A thorough review process ensued, requiring the investigator's patience and perseverance. Following several rounds of evaluations and an ethical clearance, the green light was given for the study at NISH.

While the internship phase fostered rapport-building, the research phase transformed the investigator's role. Upon receiving research permission, the investigator worked independently, supervised remotely by a guide from MSU Vadodara. The investigator would engage with students during specific times, and all interactions within NISH demanded prior approval. Despite initial administrative hurdles, the investigator's commitment remained unwavering. The study was executed at NISH with the cooperation of students, faculty, and staff, ensuring its content's validation and relevance.

3.2.1.1.1 Designing and Development of Modules

Therefore, the design and development of an accessible digital media in video-format on entrepreneurship was planned, based on the Central Board of Secondary Education Class XI Book “Entrepreneurship” and Philip Kotler's 4P’s of marketing (Product, Price, Place, & Promotion) for the deaf.

Table 2: Reference for the Design and Development of Modules on “Basics of Entrepreneurship for Deaf”

REFERENCE	TITLE OF THE MODULES
CBSE Book “Entrepreneurship” 1 st unit “Entrepreneurship: Concept & Functions	1 st module Entitled “Interest”
CBSE Book “Entrepreneurship” 5 th unit “Concept of Market	2 nd module Entitled “Convenience/Place”
CBSE Book “Entrepreneurship” 6 th unit “Business Finance & Arithmetic	3 rd module Entitled “Finance/Money – To start your own Business/Enterprise”
CBSE Book “Entrepreneurship” 4 th unit “Entrepreneurship as Innovation & Problem Solving” & 7 th unit “Resource Mobilization”	4 th module Entitled “Resource Management: How to Manage Resource”.
CBSE Book “Entrepreneurship” 5 th unit “Concept of Market” & Philip Kotler 4P’s “Promotion”	5 th module Entitled “Concept of Marketing”

3.2.1.1.2 Steps for Designing of a Module

The designing of a module in an accessible digital video-format for the Deaf involved a comprehensive process that prioritized the needs and experiences of the deaf.

- **Needs Analysis:** To study ideas and interests of students at National Institute of Speech & Hearing (NISH), Thiruvananthapuram, for becoming an entrepreneur. At NISH, it was learned that deaf students were preparing to join the industry for jobs. Though there was no 100% placement guarantee, there were students without any jobs that led us to find other options for jobs. It was decided to study their interest or ideas about self-employment.
- **Learning Objectives:** By the end of the module, students would have a fair idea about their interest or about what they want to do as an entrepreneur.
- **Content Development:** For developing the content of the Module, as described previously, the main source was the Central Board of Secondary Education for Class XI Book on “Entrepreneurship” and Philip Kotler 4ps of marketing (Product, Price, Place, & Promotion). From the CBSE Book on “Entrepreneurship”, the 1st unit “Entrepreneurship: Concept & Functions” was referred to and considered as the base to develop the 1st module entitled “Interest”. Deaf experts and educators were shown the content selected for module I to ensure its clarity, concision, and relevance with the comprehension level of the Deaf.
- **Scripting:** The scripting was framed in consultation with the subject matter and subject experts, in a way that flowed smoothly when translated into sign language.
- **Validation of the script from Experts:** The script was sent to deaf experts well-versed in sign language, viz., the President of Deaf Association, an academician of deaf studies primarily on sign language from Ali Yavar Jung National Institute of Speech & Hearing Disabilities (AYJNISHD), Mumbai, and NISH, in addition to prominent sign language interpreters, namely, General Secretary and Secretary of Indian Sign Language Interpreter Association (ISLIA) and NISH, for validation with reference to content, format and clarity.
- **Designing for Accessibility:** The following elements were considered to ensure the accessibility of the module:

- **Sign Language:** The mother tongue of the deaf is sign language and also their learning comfort is in sign language, therefore, the sign language was used to ensure accessibility. Simple and straightforward language minus unnecessary jargon was used.
- **A Story Format:** This technique was used to deliver the developed content to facilitate learning for deaf persons with short memory and slow grasping characteristics.
- **Captions:** The reverse captioning technique was used for the Deaf to easily comprehend. Using this technique, captions were written the way sign language is used; conversion of sign into text. With sign language incorporated, captions further support understanding. Captions were synchronized with the content, were easy to read, sharply contrasted against the background.
- **Consistent Layout:** A consistent layout throughout the video was maintained to make it easier to follow. This helped in reinforcing the information communicated, therefore only the location of the Tea Stall was used.

3.21.1.3 Development of module on “Basics of Entrepreneurship”-

Module-I “Interest”

A. Pre-production

- **Storyboarding:** The script was broken down into shots, then sketched or the shot was outlined scene by scene. This helped the deaf to visualize the final video and guide the shooting process, as deaf people mainly think in visuals.
- **Select the cast/audition:** The modules were crafted to be infomercial/infotainment in nature. Therefore, the deaf well-versed in sign language, inclined towards filmmaking and a creative bent of mind were considered for the audition. A sign language interpreter was required to finish the shoot of the module per schedule effectively and smoothly.
- **Crew/Team Selection:** The entire production team comprised Deaf from pre-production: assisting in script to production, actors, actresses, and camera person to postproduction: editing, and graphics, all were executed by a deaf team with the help of sign language interpreters. This ensured accurate translation of content, so the perspective of the Deaf remained in the forefront.

- **Reece/Choose a location:** A tea stall was considered, per the requirement of the script for module-I “interest”, as well as for assessing lighting, background noise, and visual aesthetics.
- **Equipment:** Camera, microphones, lights, editing software, etc
- **Scheduler/Shooting dates:** A rehearsal schedule with shooting dates, along with a post- production time plan helped the researcher to finish the module in the anticipated time frame.
- **Rehearsal:** At NISH the only time to rehearse was after classes, for which permission was sought to conduct rehearsals in one of the classes. During recess, a plan was formed for rehearsal after class. To monitor and gain confidence a rehearsal was conducted on the location to check time and logistics.

B. Production (Shooting the Video)

A production manager ensured the availability of the cast and crew on time at location. As it was an outdoor shoot and no alternatives were planned for rainy-day scenarios, the shoot had to stop during rains, delaying the shoot. Subsequently, the time-plan was reworked as some cast had to leave earlier than expected, obligating a rework of their shoot schedule to accommodate their early exits. Furthermore, time consumed in equipment set-up was pushed through, using the storyboard and script as guides. Long signlogues obligated multiple shoots to capture the perfect shot.

C. Post-production

- **Video Editing:** A team of sign language interpreters and deaf editors was formed to edit the module for okay shots, and verify sign language content on software, such as Adobe Premiere for trim, splice, and arrange video clips, insert transitions, effects, and graphics.
- **Audio Editing: Booked an audio studio at NISH on prior permission for recording voice overs,** adjusting volume levels, ensuring audio and video synchronization.
- **Color Correction/Grading:** Adjusted video colors for consistency and desired tone.
- **Add Text and Titles:** Used legible fonts for captions and ensured they fit the video's style.
- **Usability Testing:** Conducted tests with members of the Deaf community to get feedback on the clarity, pacing, and effectiveness of the module. Adjusted content and design based on feedback. Then only was the final cut presented for screening.

3.2.1.1.4 Validation of the Developed Module:

The developed module was screened at the Centre for Communication and Media Development (CCMD) at NISH for its validation by selected academicians of deaf studies primarily on sign language and sign language interpretation.

3.2.1.1.5 Construction of the Research Tool:

The research tool was developed based on the developed module considering the following parameters:

Table 3: Description of the Research Tool for the Selected Deaf Respondents from Kerala

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Knowledge test)
Features & Aspects of module	Checklist (Accessibility test)

The first section was a checklist meant to collect specific demographic details in terms of age, gender, education level, exposure to social media and experience with accessible video formats.

The second section aimed to evaluate knowledge about the basics of entrepreneurship, focusing on “Interest”.

The third section included module features, aspects, and problems faced in comprehending Accessible Digital Media and suggestions.

The construction of the tool was framed in simple English with multiple choices for easy comprehension for the deaf.

3.2.1.1.6 Validation of the Research Tool:

The research tool was validated by an academician of Deaf studies, primarily on sign language at the Centre for Communication and Media Development (CCMD), and a sign language interpreter from NISH.

3.2.1.1.7 Screening of the Module:

The module was projected in a classroom setting using a projector at National Institutes of Speech and Hearing (NISH), Kerala.

3.2.1.1.8 Administration of the Knowledge Test & Accessibility Scale:

Immediately after the module screening, participants were given a test, which included a knowledge and an accessibility test.

3.2.1.1.9 Scoring & Categorization of the Independent Variables:

The following tables describe the scoring and categorizing of the selected variables under the study.

Table 4: Scoring and Categorization of the Independent Variables of Selected Deaf Respondents from Kerala

VARIABLE	BASIS	CATEGORIES
Age	16-20 Years	Teenagers
	21-25 Years	Young Adults
	26-30 Years	Early Adults
Education	Undergraduates	Undergraduates
Gender	Males	Males
	Females	Females
Exposure to Social Media	Below Mean	Low Exposure
	Mean & Above	High Exposure
Exposure to Accessible Media	Below Mean	Low Exposure
	Mean & Above	High Exposure

3.2.1.1.10 Scoring & Categorization of the Dependent Variable:

A knowledge test was prepared to measure the comprehension level of the deaf respondents regarding the content of the module screened. There were a total of fourteen questions asked. A correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score of this test was 14, and minimum possible score was 0.

Table 5: Scoring and Categorization of the Dependent Variable in Knowledge Test of Selected Deaf Respondents from, Kerala

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Module I	Below Mean	Low Comprehension
	Mean & Above	High Comprehension

An accessibility scale prepared to measured the reactions of the respondents regarding the accessibility of the module screened. There were a total of nine questions in the research tool. The correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score of this test was 9, and the minimum possible score was 0.

Table 6: Scoring and Categorization of Dependent Variable in Accessibility Test of Selected Deaf Respondents from Kerala

VARIABLES	BASIS	CATEGORIES
Accessibility of the Module I	Below Mean	Low Accessibility
	Mean & above	High Accessibility

3.2.1.1.11 Learning from Module I:

Signlogue must be short and an introduction of each character must be indicated in the beginning for easy relation and identification of each character to easily differentiate which is which.

3.2.1.1.2 Criteria for Selection of the Institutes in the North-East:

The North-East states of India have historically faced challenges related to geographical isolation, limited infrastructure, socio-political issues, and lack of awareness about the needs of differently abled populations. As a result, the development of specialized higher education facilities for the deaf remains inadequate. While there are institutions that offer support for the differently abled in other parts of India, the North-East has not experienced equivalent growth. This can be attributed to a combination of limited resources, other pressing regional priorities, perhaps a lack of advocacy for the deaf community, and/or lack of representation in these areas. The overarching issue is a complex interplay of regional challenges and the specific needs of the deaf community, leading to a lack of dedicated institutions and programs in the North-East.

3.2.1.2.1 Designing of Module on “Basics of Entrepreneurship”- Module-II “Place/ Convenience” for Selected Deaf of North East (Meghalaya, Nagaland, Manipur)

The investigator delved into the research of Dr. Melissa Wallang, an Associate Professor of Linguistics at NERIE, NCERT Umiam, Meghalaya. Her examination of ‘Deafness and a Village Sign Language Community in Meghalaya’ inspired the present study at the School & Centre of Hearing Handicapped Children (SCHHC), Shillong, Meghalaya. Before liaising with Dr. Wallang, a comprehensive review was undertaken. Upon seeking advice from experts and professionals in the deaf studies domain, the investigator connected with Dr. Wallang. She graciously deputed a PhD student to aid the present research in Meghalaya. The assigned scholar provided with

crucial contacts within Shillong's Deaf community. Following these leads, eventually coordinated with an educator at Bethany's society, who directed to the Principal of SCHHC. The principal outlined specific research prerequisites concerning the safety and protection of special needs children, including obtaining various permissions and certificates. To satisfy these requirements, the investigator engaged with the Director of Health Services (MI), Meghalaya, and other significant authorities. Upon securing the necessary approvals, the SCHHC, Principal, facilitated our research.

- **Content Development:** For developing the content of the Module, as mentioned earlier, the main source was the Central Board of Secondary Education for Class XI Book on "Entrepreneurship" and Philip Kotler 4ps of marketing (Product, Price, Place, & Promotion).

From the CBSE Book on "Entrepreneurship", the 5th unit "Concept of Market" was referred to and considered as the base for developing the 2nd module entitled "Convenience/Place".

Deaf experts and educators were shown the content selected for module II to ensure its clarity, concision and relevance with the comprehension level of the Deaf.

- **Scripting:** The scripting was framed in consultation with the subject matter and subject experts, in a way that flowed smoothly when translated into sign language.

3.2.1.2.2 Validation of the script from Experts: The script was sent to deaf experts, well-versed in sign language like the president and some selected deaf members of the Meghalaya Deaf Association; academician of deaf studies primarily on sign language Dr. Wallang; and the SCHHC's Principal and faculty for validation with reference to content, format and clarity.

Casting for this fictional module was challenging, but after extensive scouting, investigator managed to enlist participants. The module's shooting, split into indoor and outdoor sessions was successfully concluded with the support of sign language interpreters. Subsequently, the module was showcased for feedback from Deaf experts – State Education Mission Authority of Meghalaya (SEMAM) officials, and the Meghalaya Deaf Association members. Interestingly, the administrative engagements during this process aided a local resident in obtaining crucial resources for her differently abled daughter, revealing a skewed focus on rural areas over urban ones.

In Nagaland, Dr. Wallang and her scholar suggested to explore the Deaf Biblical Ministry in Dimapur. Founded in 1987, this institution educates deaf students from grades 1-10, using English & American Sign Language (ASL). The second module, primarily in ISL, posed a linguistic challenge, but the school's principal, proficient in both sign languages, bridged the gap.\

In Manipur, post validation of the module, investigator journeyed to Imphal. Recognizing that the Deaf often knew multiple languages, the team was eager to extend its research there. Given that higher education opportunities for the deaf are limited in Manipur investigator collaborated with a former General Secretary of the Manipur Deaf Association. Though, the research endeavour to assemble the adult deaf community in Imphal faced hurdles. Though, undeterred, investigator aspired to extend the present research to other regions. The second module validation in Imphal concluded right before the Christmas break. The experiences in Imphal emphasized that many individuals with disabilities remain unaware of their rights, particularly concerning their UDID.

3.2.1.2.3 Development of learning module on “Basics of Entrepreneurship”- Module-II “Place/ Convenience” for Selected Deaf of North East (Meghalaya, Nagaland, Manipur)

The second module, which is based on CBSE Book “Entrepreneurship” 5th unit “Concept of Market” led to the development of the 2nd module “Place/ Convenience” and was scheduled for development in Shillong Meghalaya. All the parameters in the design and development of module I were also implemented in the second module. However, unlike module I, a story of 5 friends, and one set-up at an outdoor tea stall, Module II was framed with three stories divided in three chapters and two set-ups. In Module II, one was an indoor home set-up, and the second was a set-up outside a girl’s college. All the three stories had different casts. The first story/chapter included a father and daughter and the daughter’s aspirations. The second story/chapter was about three college-going girls and their aspirations. The third story/chapter was about two brothers, their mother and a friend and their struggle. This module’s signlogues of all three chapters were short and easy to sign. In this instance, each character’s introduction was in the beginning of the story, so it was easier to relate.

3.2.1.2.4 Validation of the Developed Module: The developed module was screened at the hall in the School & Centre of Hearing Handicapped Children (SCHHC) for its validation from selected academicians of deaf studies primarily on sign language, namely, the Principal, faculty staff of SCHHC, an official of the state's Education Ministry of Meghalaya, and a sign language interpreter from Shillong.

3.2.1.2.5 Construction of the Research Tool: The research tool was developed based on a developed module with following section

Table 7: Description of the Research Tool of Selected Deaf Respondents from North East (Meghalaya, Nagaland, Manipur)

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Knowledge test)
Features & Aspects of module	Checklist (Accessibility test)

The first section includes a checklist meant to collect specific demographic details in terms of age, gender, education level, exposure to social media and experience with accessible video-format.

The second section aimed to evaluate knowledge about the basics of entrepreneurship, focused on the "Place/Convenience".

The third section delved into module features, aspects, problems faced in comprehending Accessible Digital Media, and suggestions.

The construction of the tool was in simple English with multiple choices for easy comprehension for the deaf.

3.2.1.2.6 Validation of the research Tool: The research tool was validated by an academician of Deaf studies primarily on sign language, the Principal, faculty staff at SCHHC, and a sign language interpreter from Shillong.

3.2.1.2.7 Screening of the Module: The module was projected in a classroom setting using a projector.

3.2.1.2.8 Administration of the Knowledge Test & Accessibility Scale: After module screening, participants were immediately given a test, which included a knowledge and an accessibility test.

3.2.1.2.8 Scoring & Categorization of the Independent Variables: The following Tables describe scoring & categorizing of the selected variables under the study.

Table 8: Scoring and Categorization of the Independent Variables of Selected Deaf Respondents from North East (Meghalaya, Nagaland, Manipur)

VARIABLE	BASIS	CATEGORIES
Age	16-20 Years	Teenagers
	21-25 Years	Young Adults
	26-30 Years	Early Adults
Education	8 th Pass	Middle
	10 th Pass	Secondary
	12 th Pass	Senior Secondary
	Undergraduates	Undergraduates
Gender	Males	Males
	Females	Females
Exposure to Social Media	Below Mean	Low Exposure
	Mean & Above	High Exposure
Exposure to Accessible Media	Below Mean	Low Exposure
	Mean & Above	High Exposure

3.2.1.2.10 Scoring & Categorization of the Dependent Variable: A knowledge test prepared, measured the respondent's comprehension-level regarding the content of the module screened. There was a total of 14 questions asked. The correct answer scored 1 and an incorrect answer scored 0.

Thus, the maximum possible score for this test was 14, and the minimum possible score was 0.

Table 9: Scoring and Categorization of the Dependent Variable in Knowledge Test of Selected Deaf Respondents from North East (Meghalaya, Nagaland, Manipur)

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Module II	Below Mean	Low Comprehension
	Mean & above	High Comprehension

An accessibility scale prepared, measured the reactions of the respondents regarding the accessibility of the module screened. There was a total of 9 questions asked. The correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score for this test was 9, and the minimum possible score was 0.

Table 10: Scoring and Categorization of the Dependent Variable in Accessibility Test of Selected Deaf Respondents from North East (Meghalaya, Nagaland, Manipur)

VARIABLES	BASIS	CATEGORIES
Accessibility of the Module II	Below Mean	Low Accessibility
	Mean & Above	High Accessibility

3.2.1.2.11 Learning from Module II

In the three stories, all the cast consisted of native Deaf, except two characters/roles, one of a father and the other a mother in chapter 1 and chapter 3 respectively. Though both, mother & father were in fact the actual mother and father of the Deaf kids, yet multiple takes were taken, delaying the shoot.

3.2.1.3 Criteria for Selection of the Institutes in Odisha

Module III, based on the CBSE Book “Entrepreneurship”, 6th unit “Business Finance & Arithmetic”, led the development of the 3rd module “Finance/Money: To start your own Business/Enterprise”. All the parameters in the design and development implemented in I & II module were also implemented in this module. Except this module was non-fiction based and interview based. This module focused on Finance Schemes to start businesses, therefore interviews of officials at the State Government of Odisha, Swabhiman NGO, and S.NO.M Group CSR, were featured with the service of sign language interpreters.

Mr. Sibaji Panda of Odisha, a renowned researcher in Deaf sign language and the founder of Happy Hand School, motivated us to undertake validation at the Bhubaneswar-based Satyabhama Devi College for the Deaf. When planning to execute research at this college, which receives support from the Department of Social Security & Empowerment of Person with Disability (SSEPD) — a division dedicated to individuals with disabilities under the Odisha government — permissions were to sought from the Secretary and Commissioner of SSEPD. Meeting the Commissioner proved challenging, as he was available only on Mondays between 3 and 5 pm. Due to holidays and absences, it took a month to finally appoint a scheduled meeting. However, investigator’s request was initially declined. Persistence led to case being referred to a senior department director, an IAS officer, which added another month of waiting due to bureaucratic delays.

After a two-month-long effort, finally secured the necessary permission to conduct the research.

3.2.1.3.1 Designing of learning module on “Basics of Entrepreneurship”- Module-III “Finance/Money: To start your own Business/Enterprise” for Selected Deaf of Odisha

- **Content Development:** For developing the content of the Module, as described previously, the main source was the Central Board of

Secondary Education for Class XI Book on “Entrepreneurship” and Philip Kotler 4ps of marketing (Product, Price, Place, & Promotion).

From the CBSE Book on “Entrepreneurship”, 5th unit 6th unit “Business Finance & Arithmetic”, led the development of the 3rd module “Finance/Money: To start your own Business/Enterprise”.

Deaf experts and educators were shown the content selected for module III to ensure its clarity, concision and relevance with the comprehension level of the Deaf.

- **Scripting:** The scripting was framed in consultation with the subject matter and subject experts, in a way that flowed smoothly when translated into sign language.

3.2.1.3.2 Validation of the Script from Experts: The script was sent to Deaf experts, well-versed in sign language, to mention a few, the President and some selected Deaf members at the Odisha Deaf Association; academician of Deaf studies, primarily on sign language from regional centre of AYJNISHD; and a sign language interpreter for validation with reference to content, format and clarity.

Yet, another challenge arose: a student raised concerns about the food quality at Satyabhama Devi College. As a result, the SSEPD launched an investigation, and the research was put on hold until the inquiry concluded.

3.2.1.3.3 Development of Module III “Finance/ Money: To start your own Business/ Enterprise”

This module delved into financial programs designed for individuals with disabilities looking to start a business. Initially intended to craft a fictional narrative for this module, but a lack of student’s participation from Satyabhama College made it unfeasible. Consequently, transitioned to a nonfictional approach, centring on financial aspects. We reached out to the National Handicapped Financial Development Corporation (NHFDC), learning about their collaboration with the Punjab National Bank (PNB) and IDBI Bank. Investigators exploration led to interview the Under-Secretary of SSEPD, Government of Odisha, who, being visually impaired, necessitated the assistance of a sign language interpreter. The under-secretary provided insights into both state and NHFDC/PNB financial programs for the disabled community. An interview with the chairman of S.NO.M Group was also scheduled to understand their Corporate Social Responsibility (CSR) initiatives,

which again involved the services of a sign language interpreter. Third interview featured the Project Officer from the Swabhiman NGO in Bhubaneswar, who was hearing-abled. Therefore, her discussion about their livelihood projects for the disabled community was translated by a sign language interpreter. This module primarily centred on financial opportunities for businesses owned by those with disabilities. In the course of the investigation, a critical gap was identified in the Odisha Government's support system: the lack of sign language interpreters in educational institutions for the deaf, including schools and specialized ITIs. This finding emphasized a pervasive issue in India's Deaf education system, motivating us to broaden our inquiry across the country.

3.2.1.3.4 Validation of the Developed Module: The developed module was screened at the Odisha Deaf Association Hall for its validation from selected deaf official and members of Odisha, including the Deaf Association, academicians of deaf studies primarily on sign language from the regional center AYJNISHD, and sign language interpreters from Bhubaneswar.

3.2.1.3.5 Construction of the Research Tool: The research tool was developed based on developed module with following section:

Table 11: Description of the Research Tool for the Selected Deaf Respondents from Odisha

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Knowledge test)
Features & Aspects of module	Checklist (Accessibility test)

The first section is a checklist meant to collect specific demographic details in terms of age, gender, education-level, exposure to social media and experience with accessible video-format.

The second section aims to evaluate knowledge about the basics of entrepreneurship, focusing on “Finance/ Money – To Start your Own Business/ Enterprise”.

The third section delves into module features, aspects, problems faced in comprehending Accessible Digital Media and suggestions.

The construction of the tool implemented simple English with multiple choices for easy comprehension for deaf.

3.2.1.3.6 Validation of the research Tool: The research tool was validated by selected deaf official and members of the Odisha Deaf Association; academicians of deaf studies, primarily on sign language from the regional centre AYJNISHD; Deaf College; an NGO working for the Deaf; and a sign language interpreter from Bhubaneswar.

3.2.1.3.7 Screening of the Module: The module was showcased in a classroom setting using a projector.

3.2.1.3.8 Administration of the knowledge test & Reaction Scale: After module screening, participants were immediately given a test, which included a knowledge and an accessibility test.

3.2.1.3.9 Scoring & Categorization of the Independent Variables: The following table describe scoring and Categorizing of the selected variables under the study.

Table 12: Scoring and Categorization of the Independent Variables of Deaf Respondents from Odisha

VARIABLE	BASIS	CATEGORIES
Age	16-20 Years	Teenagers
	21-25 Years	Young Adults
	26-30 Years	Early Adults
Education	8 th Pass	Middle
	10 th Pass	Secondary
	12 th Pass	Senior Secondary
	Undergraduates	Undergraduates
Gender	Males	Males
	Females	Females
Exposure to Social Media	Below Mean	Low Exposure
	Mean & Above	High Exposure
Exposure to Accessible Media	Below Mean	Low Exposure
	Mean & Above	High Exposure

3.2.1.3.10 Scoring & Categorization of the Dependent Variable: A knowledge test prepared, measured the comprehension level of the respondents regarding the content of the module screened. There was a total of 14 questions asked. The correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score for this test was 14 and the minimum possible score 0.

Table 13: Scoring and Categorization of Scores in Knowledge Test of Selected Deaf Respondents from Odisha.

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Module III	Below Mean	Low Comprehension
	Mean & Above	High Comprehension

An Accessibility scale prepared, measured the reactions of the respondents regarding the accessibility of the module screened. There was a total of 9 questions asked. The correct answer scored 1, and an incorrect answer scored 0. Thus, the maximum possible score of this test was 9, and the minimum possible score 0.

Table 14: Scoring and Categorization of Scores in Accessibility Test of Selected Deaf Respondents from Odisha

VARIABLES	BASIS	CATEGORIES
Accessibility of the Module III	Below Mean	Low Accessibility
	Mean & Above	High Accessibility

3.2.1.3.11 Learning from Module –III

Though the interpreter was a qualified interpreter and teaching deaf students in a government aided Deaf school run by the Odisha Deaf Association, they still could not match signs with the native deaf. Learning from this module was to only use/employ the Deaf when involved in policies or issues related to the Deaf community. Also, there was no Deaf working in the Department of SSEPD, Odisha Government; in the NGO, Swabhiman and S.NO.M Group, CSR, or otherwise a well-versed sign language interpreter.

3.2.1.4 Criteria for Selection of the Institutes in Rajasthan

Having spent over a decade studying the deaf community, the researcher is familiar with the Jaipur Government Deaf College – the sole co-educational institution in Rajasthan catering to the deaf. Established in 2016, the college offers a Bachelor of Arts program in various disciplines, including Hindi, English, Political Science, Sociology, Public Administration, and Drawing. For the present study, which focused on resource management, the researcher sought to identify self-employed deaf individuals.

3.2.1.4.1 Designing of learning module on “Basics of Entrepreneurship”- Module-IV “Resource Management: How to Manage Resource” for Selected

Deaf of Rajasthan

- **Content Development:** For developing the content of the Module, as described previously, the main source was the Central Board of Secondary Education for Class XI Book on “Entrepreneurship” and Philip Kotler 4ps of marketing (Product, Price, Place, & Promotion).

From the CBSE Book on “Entrepreneurship”, 4th unit “Entrepreneurship as Innovation & Problem Solving” & 7th unit “Resource Mobilization”.

Deaf experts and educators were shown the content selected for module IV to ensure its clarity, concision and relevance with the comprehension level of the Deaf.

- **Scripting:** The scripting was framed in consultation with the subject matter and subject experts, in a way that flowed smoothly when translated into sign language.

3.2.1.4.2 Validation of the Script from Experts:

The script was sent to Deaf experts, well-versed in sign language, such as, an academician of Deaf studies primarily on sign language from the Jaipur Government Deaf College, and a sign language interpreter for validation with reference to content, format and clarity.

Subsequently, an opportunity arose to hold a workshop on entrepreneurship. Given the tight timeline – as the college was soon closing for exam preparations – the researcher had to swiftly shoot and edit the workshop's footage. This content was then presented to the faculty, staff, and students at the Jaipur Government Deaf College for validation.

3.2.1.4.3 Development of Module IV: “Resource Management: How to Manage Resource”

While conducting research, investigator received help from a college alumna skilled in sign- language interpretation. Her expertise enabled us to coordinate interviews with Deaf entrepreneurs, though finding participants was initially difficult. Thus sought assistance from the Deaf Association, parents and children of Deaf adults (CODA), siblings of Deaf adults (SODA), and educators with ties to the Deaf community, which helped to arrange the interviews. However, unexpected obligations led to the cancellation of some interviews at the last minute.

The module's script followed a non-fiction format, with interviews taking place at business locations of the participants. This setup necessitated detailed planning to

conduct interviews throughout Jaipur City. Thus a list of Deaf entrepreneurs was compiled and sought their agreement to participate. During the first interview, a Deaf entrepreneur was uncomfortable discussing his earnings and reluctant to be filmed. Then after persuasion the investigator was allowed filming at their respective business sites. Since all participants were Deaf entrepreneurs, their interviews were filmed directly with prior approval, accommodating their schedules. For instance, interview of a stationary owner was scheduled in the morning because his shop was near a school. Investigator also spoke with a Deaf female entrepreneur who operated a boutique from her house, another running a parlour from her home, and a confectionery owner. Each one was interviewed at their business premises about managing their operations. Once the shooting was completed the task of editing was done for three days, & the module was completed.

3.2.1.4.4 Validation of the Developed Module:

The developed module was screened to Deaf experts, well-versed in sign language, such as academicians of deaf studies primarily on sign language from Government Deaf College Jaipur, and a sign language interpreter for validation with reference to content, format and clarity.

3.2.1.4.5 Construction of the Research Tool: The research tool was developed based on developed modules considering the following:

Table 15: Description of the Research Tool for the Selected Deaf Respondents from Rajasthan

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Knowledge test)
Features & Aspects of module	Checklist (Accessibility test)

The first section is a checklist meant to collect specific demographic details in terms of age, gender, education-level, exposure to social media and experience with accessible video-format.

The second section aims to evaluate knowledge about the basics of entrepreneurship focusing on “Resource Management: How to Manage Resource”.

The third section delves into module features, aspects, problems faced in

comprehending Accessible Digital Media and suggestions.

The construction of the tool was in simple English with multiple choices for easy comprehension for deaf.

3.2.1.4.6 Validation of the research Tool: The research tool was validated by an academicians of Deaf studies primarily on sign language, Principal, faculty staff of Govt. Deaf College, and a sign language interpreter from Jaipur.

3.2.1.4.7 Screening of the Module: The module was showcased in a classroom setting using a projector.

3.2.1.4.8 Administration of the Knowledge Test & Reaction Scale: After module screening, participants were immediately given a test, which included a knowledge and an accessibility test.

3.2.1.4.9 Scoring & Categorization of the Independent Variables: The following Table describe scoring and Categorizing of the selected variables under the study.

Table 16: Scoring and Categorization of the Independent Variables of Selected Deaf Respondents from Rajasthan

VARIABLE	BASIS	CATEGORIES
	16-20 Years	Teenagers
Age	21-25 Years 26-30 Years	Young Adults Early Adults
	10 th Pass	Secondary
Education	12 th Pass Undergraduates	Senior Secondary Undergraduates
	Males	Males
Gender	Females	Females
Exposure to Social Media	Below Mean Mean & Above	Low Exposure High Exposure
Exposure to	Below Mean	Low Exposure
Accessible Media	Mean & Above	High Exposure

3.2.1.4.10 Scoring & Categorization of the Dependent Variable: A knowledge test prepared, measured the comprehension level of the respondents regarding the content

of the module screened. There was a total of 14 questions asked. The correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score of this test was 14, and the minimum possible score was 0

Table 17: Scoring and Categorization of Scores in Knowledge Test of Selected Deaf Respondents from Rajasthan

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Module IV	Below Mean	Low Comprehension
	Mean & Above	High Comprehension

An Accessibility scale prepared, measured the reactions of the respondents regarding the accessibility of the module screened. There was a total of 9 questions asked. A correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score on the test was 9, and the minimum possible score was 0.

Table 18: Categorization and Scoring of Scores in Accessibility Test of Selected Deaf Respondents from Rajasthan

VARIABLES	BASIS	CATEGORIES
Accessibility of the Module IV	Below Mean	Low Accessibility
	Mean & Above	High Accessibility

3.2.1.4.11 Learning from Module IV

The fourth module, based on the CBSE Book “Entrepreneurship”, 4th unit “Entrepreneurship as Innovation & Problem Solving”, and 7th unit “Resource Mobilization”, led the development of the 4th module “Resource Management: How to Manage Resource”. All the parameters of design

and development of the module implemented in the 1st & 2nd modules were implemented in this module. Similar to the 3rd module, this module was also non-fiction and interview-based of deaf entrepreneurs.

3.2.1.5 Criteria for Selection of the Institutes in Delhi

The final module focused on Marketing and was developed at the Indian Sign Language Research & Training Centre (ISLRTC), which was established in New Delhi on September 28, 2015. The researcher, having studied at the AYJ National

Institute of Speech and Hearing Disabilities (AYJNISHD), utilized contacts from the institute who currently work at ISLRTC. Due to ISLRTC's governmental affiliation, obtaining permission to conduct research there required adherence to established protocols.

3.2.1.5.1 Designing of learning module on “Basics of Entrepreneurship”-Module-V “Concept of Market” for Selected Deaf of Delhi

- **Content Development:** For developing the content of the Module, as described previously, the main source was the Central Board of Secondary Education for Class XI Book on “Entrepreneurship” and Philip Kotler 4ps of marketing (Product, Price, Place, & Promotion).

From the CBSE Book on “Entrepreneurship”, 5th unit “Concept of Market” was referred to and considered as the base to develop the 5th module entitled “Concept of Market” Deaf experts and educators were shown the content selected for module V to ensure its clarity, concision and relevance with the comprehension level of the Deaf.

- **Development of Script:** After securing permission from the ISLRTC's Director, logistical challenges arose, particularly concerning student schedules. Students were tasked with drafting a script as an assignment.

3.2.1.5.2 Validation of the script from Experts: This script underwent consultation with deaf teachers and sign language interpreters before being implemented in the shoot. The script was sent to Deaf experts, well-versed in sign language, such, an academician of Deaf studies, primarily on

sign language from the Indian Sign language Research & Training Centre (ISLRTC), and a sign language interpreter for validation with reference to content, format and clarity.

3.2.1.5.3 Development of Module V: “Concept of Marketing”

Due to class commitments, students would miss their sessions for filming, restricting the shooting opportunities during the alumna's class timings. However, several students with prior experience in filmmaking stepped up and played a significant role in developing the module. Rehearsals were planned & arranged during their regular classes to familiarize them with their roles. Once roles and scenes were finalized, the students were provided flexibility to help in production and post- production of the module based on their availability.

3.2.1.5.4 Validation of the Developed Module: The developed module was screened for Deaf experts, well-versed in sign language, such as, an academicians of Deaf studies primarily on sign language from the Indian Sign language Research & Training Centre (ISLRTC), and sign language interpreters for validation with reference to content, format and clarity.

3.2.1.5.5 Construction of the Research Tool: The research tool was developed based on developed modules with following section:

Table 19: Description of the Research Tool of Selected Deaf Respondents from Delhi

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Comprehension test)
Features & Aspects of module	Checklist (Accessibility test)

The first section is a checklist meant to collect specific demographic details in terms of age, gender, education-level, exposure to social media and experience with accessible video-formats.

The second section aims to evaluate knowledge about the basics of entrepreneurship focusing on “Concept of Marketing”.

The third section included module features, aspects, problems faced in comprehending Accessible Digital Media and suggestions.

The construction of the tool was made in simple English with multiple choices for easy comprehension for deaf.

3.2.1.5.6 Validation of the research Tool:

The research tool was validated by academicians of Deaf studies primarily on sign language from the Indian Sign language Research & Training Centre (ISLRTC), and sign language interpreters, New Delhi.

3.2.1.5.7 Screening of the Module: The module was projected in a classroom setting using a projector.

3.2.1.5.8 Administration of the Knowledge Test & Reaction Scale: After module screening, participants were immediately given a test, which included a knowledge and an accessibility test.

3.2.1.5.9 Scoring & Categorization of the Independent Variables: The following Tables describe scoring and categorizing of the selected variables under the study.

Table 20: Scoring and Categorization of the Independent Variables of Selected Deaf Respondents from Delhi

VARIABLE	BASIS	CATEGORIES
Age	16-20 Years	Teenagers
	21-25 Years	Young Adults
	26-30 Years	Early Adults
Education	12 th Pass	Senior Secondary
	Undergraduates	Undergraduates
Gender	Males	Males
	Females	Females
Exposure to Social Media	Below Mean	Low Exposure
	Mean & above	High Exposure
Exposure to Accessible Media	Below Mean	Low Exposure
	Mean & above	High Exposure

3.2.1.5.10 Scoring & Categorization of the Dependent Variable:

A knowledge test prepared, measured the comprehension-level of the respondents regarding the content of the module screened. There was a total of 14 questions asked. A correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score of this test was 14, and the minimum possible score was 0.

Table 21: Scoring and Categorization of Scores in Knowledge Test of Selected Deaf Respondents from Delhi

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Module V	Below Mean	Low Comprehension
	Mean & Above	High Comprehension

An Accessibility scale prepared, measured the reactions of the respondents regarding the accessibility of the module screened. There was a total of 9 questions asked. A correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score of this test was 9, and the minimum possible score was 0.

Table 22: Scoring and Categorization of Scores in Accessibility Test of Selected Deaf Respondents from Delhi

VARIABLES	BASIS	CATEGORIES
Accessibility of the Module V	Below Mean	Low Accessibility
	Mean & Above	High Accessibility

3.2.1.5.11 Learning from Module V

The fifth module, based on the CBSE Book “Entrepreneurship”, 5th unit “Concept of Market”, & Philip Kotler 4ps “Promotion”, led to the development of the 5th module “Concept of Marketing”. All the parameters of design and development implemented in the Ist & IInd modules were\

implemented in this module. The script of the 5th module on “Concept of Marketing” was fiction and in a story form with 5 characters, 3 females and two males as the lead.

Part 3: Experiment of Modules on Accessible Digital Media in Video Format on “Basics of Entrepreneurship for Deaf”

3.3 Planning for the Final Experiment

The Feasibility Study was conducted in Vadodara, the city housing the investigator's university, which also served as the planned location for the final pre-post evaluation. Due to observed challenges in gathering deaf individuals initially in Vadodara for a single event, it was deemed necessary to create an event to accomplish this. A workshop was proposed in collaboration with the Vadodara Municipal Corporation (VMC) and Mook Badhir Mandal (MBM), under the auspices of the Department of Extension & Communication, Faculty of Family & Community Sciences at The Maharaja Sayajirao University of Baroda (MSUB). The researcher obtained a support letter for the workshop, where all modules on entrepreneurship for the Deaf would be presented. While VMC was hesitant to participate under the MSUB banner, MBM endorsed the event. After VMC's withdrawal, United Way of Baroda, a Vadodara-based NGO, was approached but subsequently declined participation.

Consequently, Indore was selected due to existing connections with the Indore Deaf Bilingual Academy (IDBA). Managed by Mook Badhir Sangathan, IDBA offers a comprehensive educational program, from nursery to post-graduation levels, including various vocational training courses. Central to IDBA's ethos is Educational Bilingualism, which emphasizes teaching through Indian Sign Language (ISL),

ensuring fluency in ISL among both teachers and students.

3.3.1 Research Instrument Development

A research instrument was devised that employed questionnaires in both sign language and English. This tool mainly utilized objective-type questions in a yes/no format and multiple choices.

The investigator designed the following sections to gather data:

Table 23: Description of the Research Tool for the Selected Deaf Respondents from Madhya Pradesh

SECTIONS	TOOLS
Background information including variables of selected respondents	Checklist (Profile)
Comprehension of module	Checklist (Comprehension test)
Features & Aspects of module	Checklist (Accessibility test)

The first section was to collect specific demographic details in terms of age, gender, education level, exposure to social media and experience with accessible video format.

The second section aimed to evaluate knowledge about the basics of entrepreneurship, focusing on Interest, Convenience/Place, Finance/Money: To Start Your Own Business/Enterprise, Concept of Marketing and Resource Management: How to Manage Resources.

The third section delved into module features, aspects, problems faced in comprehending Accessible Digital Media and suggestions.

3.3.2 Research Tool Validation

The research tools were validated by the experts in the field of Deaf Disability. The validators were requested to review the tools and give their expert critical remarks about the content, framing of the questions/statements, clarity of the language, ease in comprehension, and the time required to complete the tool. The researcher invited suggestions to include in the research tool. However no major suggestions were received.

3.3.3 Ethical Considerations

During the research study, the investigator considered and followed the necessary ethical measures. First and foremost, important permissions were sought from the administrative authorities of various institutes/organisations for the designing and development of the modules, as well as administering the experiments. For this, the Ministry of Health & Ministry of State Education at Shillong, Meghalaya, Ministry of Social Justice & Empowerment, Orissa, and Ministry of Social Justice & Empowerment, New Delhi, were approached.

The investigation required to get the written scripts of the modules validated by the experts from the field of Deaf Disability as well as Media Experts.

Once the experts validated the scripts, five modules were developed. Further, the modules were validated by experts.

Moreover, the tools constructed by the investigator were validated by the experts in the field of Deaf Disability.

The investigator also had gained written consent from all the participants before the execution of the experiment in all the six states namely: Kerala, North-East, Odisha, Rajasthan, New Delhi, and Madhya Pradesh.

3.3.4 Planning for the Final Execution of the Experimental Study

The experimental treatments were assigned to first and third year graduate students assembled in one class. The target segment was above 16 and pursuing higher education, in place of individuals, due to constraints of administration. Thus, the nature of the study was experimental, taking into consideration heterogeneity with reference to gender and education-level. Permission was taken from the Founder & Principal of Indore Deaf Bilingual Academy (IDBA) for screening and conducting the experiment from Director of Higher Education, for availability of faculty and students, from the Indian Sign Language Cell for the availability of sign language interpreters, as

well as from the faculty of FY, SY and TY. The class was secured in advance to conduct the experiment. A time-plan was prepared, and classes fixed accordingly.

3.3.4.1 Experiment Execution

The experiment was executed in April 2023, incorporating both pre and post-test designs. Therefore, the execution involved three distinct stages:

- ❖ Administering the Pre-test.
- ❖ Screening of Modules.

- ❖ Administering the Post-test.
- ❖ **Administering The Pre-Test**

The pre-test was conducted with the selected Deaf before the actual screening. It included the administration of the first and second section of the research tool.

- An orientation was given regarding the experiment by the investigator, followed by the sign language interpreter.
- Their consent was sought for participation by filling-in a consent form.
- The pre-test form was distributed to all the selected Deaf respondents.
- The consent form and each question with their multiple choices were explained through a sign language interpreter.

Pre-Test Challenges

- Participants, due to limited vocabulary, frequently sought clarifications.
- Even with explanations provided by interpreters, there were numerous questions regarding the wording in the research tool.
- Due to extensive queries, multiple sign language interpreters were required, with six interpreters ultimately assisting 78 participants.
- ❖ **Screening of the Modules:** Modules were projected in a classroom setting using a projector.
- ❖ **Administering The Post-Test**

After module screening, participants were immediately given a post-test, which included a knowledge and an accessibility test.

The concluding pre-post study was conducted in Indore. Notably, IDBA boasts some of India's most proficient sign language interpreters. Through this experience, the importance of sign language interpreters in enhancing the comprehension of the Deaf became evident to the researcher.

3.3.5 Scoring & Categorization of the Independent Variable: The following Table describe scoring & Categorizing of the selected variables under the study.

Table 24: Scoring and Categorization of the Independent Variable of the Selected Deaf Respondents from Madhya Pradesh

VARIABLE	BASIS	CATEGORIES
Age	16-20 Years	Teenagers
	21-25 Years	Young Adults
	26-30 Years	Early Adults
Education	10 th Pass	Secondary
	12 th Pass	Senior secondary
	Undergraduates	Undergraduates
Gender	Males	Males
	Females	Females
Exposure to Social Media	Below Mean	Low Exposure
	Mean & Above	High Exposure
Exposure to Accessible Media	Below Mean	Low Exposure
	Mean & Above	High Exposure

3.3.6 Scoring & Categorization of the Dependent Variable: A knowledge test prepared, measured the comprehension-level of the respondents regarding the content of the module screened. There was a total of 14 questions asked. A correct answer scored 1 and an incorrect answer scored 0. Thus, the maximum possible score for this test was 14, and the minimum 0.

Table 25: Scoring and Categorization of Scores in Knowledge Test for the Selected Deaf Respondents from Madhya Pradesh

VARIABLES	BASIS	CATEGORIES
Comprehension regarding the Modules on Basics of Entrepreneurship	Below Mean	Low Comprehension
	Mean & Above	High Comprehension

An Accessibility scale prepared, measured the reactions of the respondents regarding the accessibility of the module screened. There was a total of 9 questions asked. A correct answer scored 1, and an incorrect answer 0. Thus, the maximum possible score for this test was 9, and the minimum 0.

Table 26: Scoring and Categorization of Scores in Accessibility Test for the Selected Deaf Respondents from Madhya Pradesh

VARIABLES	BASIS	CATEGORIES
Accessibility of the Modules on Basics of Entrepreneurship	Below Mean	Low Accessibility
	Mean & Above	High Accessibility

3.3.7 Plan of Statistical Analyses

Table 27: Different Statistical Measures Used for Analysis of Data

PURPOSE	STATISTICAL MEASURES USED
Background information of the respondents	Percentages
Overall Effectiveness of the module on 'Basics of Entrepreneurship' in terms of Comprehension amongst the selected Deaf	Wilcoxon Sign Rank Test (Non-parametric Statistics)
Significant differences in the effectiveness of the module on 'Basics of Entrepreneurship' in terms of comprehension amongst the selected Deaf in relation to the following variables: Age Education Gender Exposure to Social Media Exposure to Accessible Media	Mann-Whitney U Test (Non-parametric Statistics)
Overall Accessibility of the Designed & Developed Modules on the Basics of Entrepreneurship	Wilcoxon Sign Rank Test (Non-parametric Statistics)
Variable Wise Significant Differences in the Accessibility of the Designed & Developed Modules on the 'Basics of Entrepreneurship'	Mann-Whitney U Test (Non-parametric Statistics)
Accessibility of the Designed & Developed Modules on the 'Basics of Entrepreneurship' with Reference to the Selected Features	Percentage