Inclusive eCooking and Disability: Rethinking Access, Agency and Energy Justice

A MECS Report

PREPARED BY

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MECS Modern Energy Cooking Services

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About MECS Programme:

Modern Energy Cooking Services (MECS) Programme is an eleven-year research programme funded by UK Aid (FCDO). We are a geographically diverse, multicultural and transdisciplinary team working in close partnership with NGOs, governments, private sector, academia and research institutes, policy representatives and communities in 16 countries of interest to accelerate a transition from biomass to genuinely 'clean' cooking.

In seeking to spark a new approach to clean cooking, the MECS programme researches the socio- economic realities of a transition from polluting fuels to a range of modern fuels. Whilst the research covers several clean fuels, the evidence is pointing to the viability, cost effectiveness, and user satisfaction that energy efficient electric cooking devices provide. Significant progress has been made in access to electricity in the last decade, but these gains are sometimes disconnected from the enduring problem of clean cooking. By integrating modern energy cooking services into the planning for electricity access, quality, reliability and sustainability, MECS hopes to leverage investment in renewable energies (both grid and off-grid) to address the clean cooking challenge.

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Prepared by Dr. Amita Bhakta (Independent Researcher, UK), Ms. Divya Wesley, Ms. Krishna Keshavani and Ms. Katha Bhatt (Prabhat Education Foundation, India)

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Executive Summary

This study, collaboratively conducted by Prabhat Education Foundation and Dr. Amita Bhakta (Independent Researcher) explores how eCooking appliances impact the wellbeing of people with disabilities (PwDs) and caregivers in the urban setting of Ahmedabad, India. It explores how PwDs can be included in the transition to eCooking through policy shifts and mechanisms that enable both universal design of appliances and support to access and use them. Whilst eCooking has the potential to become widespread due to the extensive access to electricity across India, policy, design and infrastructural provisions for eCooking have overlooked the needs of PwDs.

This research involved 19 households, including PwDs and their caregivers, and 11 experts, to understand the opportunities and challenges of eCooking for people with different impairments. The study reveals scope for improvement in kitchen infrastructure and in the design of eCooking appliances, along with other supportive measures, through participatory methods including cooking diaries, interviews, PhotoVoice, surveys, in-field follow-ups, drawings and participatory workshops.

Key Findings

The findings of this study are multilayered, and inherently shaped by the socio-cultural contexts in which people with disabilities and their families live. The following key findings are thematically organised, drawing on data from the different tools.

Collaborative research and peer learning approaches through inclusive co-learning platforms are key to including PwDs in eCooking. By using a participatory and collaborative model through dedicated workshops and social media messaging apps, participants could share experiences and gain peer support through cross-disability interactions, giving strengthened community social capital. Collaborative, inclusive approaches can be used to create accessible audio, tele and video cooking diaries for PwDs and caregivers.

Accessible household kitchen infrastructure is a prerequisite to inclusion. Kitchens need to be modified for PwDs to use eCooking appliances, using measures such as lower plug points and switchboards, customised storage units and accessible platforms. Limited square footage in the home can force PwDs to relocate eCooking equipment after each use, which can necessitate assistance from others.

Technical support and maintenance infrastructure are required for long-term sustainability for eCooking and disability programmes. As local repair facilities for specialised eCooking devices are often unavailable, providing timely guidance and establishing a reliable maintenance system is key to ensuring the success of disability-inclusive eCooking programmes.

Transitions to eCooking are diverse and non-linear, shaped intrinsically by psychosocial factors. PwDs and caregivers' journeys were highly influenced by psychosocial factors, and there was significant variation between participants. Whilst some participants mastered both use and maintenance of eCooking appliances, some restricted themselves to only using certain functions, and others remained fearful from the start until the end. Adoption was most robust where: functional necessity aligned with perceived safety, family dynamics were enabling, psychological fears were directly addressed, and where time savings were meaningfully redistributed. eCooking transitions had significant psychosocial impacts on participants, who were also affected by wider psychosocial factors, such as the supportive role of men and boys, senses of safety and fear, confidence, and caregiving roles. A sense of agency, independence, confidence, empowerment and enjoyment was clear, but this was not immediate, uniform nor universal. Independence is shaped by: a sense of safety; confidence in PwDs and psychological reassurance from others; functional demand and necessity; removal of fear from open flames and LPG gas; reclaiming time; intrinsic motivation; trust in the appliances from caregivers; and a sense of happiness and satisfaction. The benefits of the portability and 'smart' features of eCooking appliances can be offset by a 'transit dependency' and the 'physical friction' of the need to set up and put away the appliances, and a dependency for PwDs on family members to prepare cooking spaces, leading to LPG use and slippage in the eCooking transition. eCooking can bring a sense of 'modernity' through digital confidence to PwDs. Gender shapes eCooking experiences. Women with disabilities remain overwhelmingly responsible for cooking, even after the introduction of eCooking technologies, but the role of men and boys was significant. Household hierarchy and restrictions impact PwDs' ability to engage in eCooking. eCooking provides space to rest through time-saving. eCooking is a socio-technical intervention that intersects with gender norms, disability, caregiving labour, household hierarchy, and identity formation.

Universal design of eCooking appliances is critical to including PwDs. eCooking appliances were valued for being portable and lightweight, and enabled PwDs to sit whilst cooking, but that several features needed to be added for accessibility. These included:

- Audible alerts to tell people when food is ready such as buzzers
- Audio descriptions, talking features and voice prompts for functions
- Tactile markers and Braille and local language labelling on buttons
- Non-slip bases
- Promoting the use of existing features such as timers
- Simplified toggle buttons

EPCs bring advantages because they have multiple features for ease of use, are a 'one pot' cooking system that reduces physical strain, enable PwDs to sit down and cook, have robust safety features, reduce the risks of burning hands, are easy to maintain, and can

let PwDs and caregivers leave food to cook with a timer. EPC design however can be improved through:

- Integrating audible alerts
- Improving lids through making them lighter and adding silicone grips and latch mechanisms that require minimal force
- Reviewing the number of buttons to reduce confusion
- Improving the interface of the EPC to make it more accessible

Rice cookers are beneficial due to their safety features, simple operation, 'keep warm' function and reduced physical effort, and their deep pots which stop food from boiling over. The accessibility of rice cookers can be improved by ensuring the integration of appropriate buttons for functions and audio alerts. Use of induction cooktops by is shaped heavily by design. Beeps for existing induction controls are confusing for those with visual impairments, which is compounded by the absence of Braille marker. Audio cues and vibrations are important in induction cooking design. eCooking appliances can be make more accessible by focusing on appliance weight, cord length, storage solutions, interface language in either Braille or local language, as well as the use of pictorial representations. Design must consider storage, transport, and setup.

Supportive cooking technologies are key to including PwDs in eCooking. Food preparation can be supported through vegetable choppers and food processors.

Recommendations:

To facilitate inclusive eCooking which can enhance the cooking experience, wellbeing and economic opportunities of PwDs, and to inform policy, standards and market mechanisms that ensure no one is left behind in the clean cooking transition, the following recommendations have emerged from the study.

<u>Recommendations for standards:</u>

1. **Universal eCooking technology design and manufacturing**

- Universal design principles need to be applied for an inclusive transition to eCooking for everyone, including PwDs.ocalised eCooking appliance interfaces with buttons labelled in local languages (e.g. Gujarati, Hindi etc.) should be standard practice.
- eCooking appliances need to integrate audio cues, talking features, braille labelling, voice automation, pictorial representation like 🫘🍗 and tactile interfaces to make them accessible. Critically, PwDs should be consulted in the design process.
- Space needs to be created for PwDs to overcome fears of using eCooking appliances, through training, capacity building, demonstrations, and piloting.
- Design must consider storage, transport, and setup. Lighter materials, integrated cord storage, and placement solutions can reduce "transit dependency".

- eCooking appliance designers and manufacturers should employ PwDs, to ensure inclusive features are embedded from the start. Collaboration is needed with product experts in the field of universal design, to include older people as well as PwDs in eCooking.
- Experience centres for PwDs to test eCooking products at places such as disabled people's organisations or Composite Regional Centres should be set up to create awareness about products and demonstrators

2. Health and ergonomic considerations

- Programmes on disability and eCooking need to assess the role that ergonomics play in health and supporting PwDs to use eCooking appliances

3. Collection of data on energy access, cooking, and disability

- The upcoming Census and other mechanisms such as NFHS (National Family Health Survey) and NSS (National Service Scheme) should be used to collected disaggregated data on disability and clean energy access.
- Different actors need to come together and organise to collect data, and civil society actors need to be engaged with government to ensure that data can be pulled together from different sources, facilitating the creation of a common database on disability, energy access and cooking.
- Data should be used to implement standards created for kitchen design.
  Data should be used to facilitate dialogue with eCooking appliance manufacturers on how to include PwDs

4. Government policy and programme support for PwDs to access eCooking technologies

- Since local repair facilities for such specialized devices are often unavailable, providing timely guidance and establishing a reliable maintenance system **is** a critical component of the success of eCooking programming for households with PwDs.
- India's Unique Disability ID Portal should be used as a platform for raising awareness about and facilitating support to access inclusive eCooking technologies.
- National level schemes to expand access to eCooking should be tapped into for households with PwDs, including those by Energy Efficiency Services Limited (EESL). The Assistance to Disabled Persons (ADIP) Scheme, National Handicapped Finance and Development Corporation/ National Divyangjan Finance and Development Corporation (NHFDC), and the Samarth Scheme (The National Trust) can facilitate access to eCooking through financial assistance and support economic empowerment through income generation via eCooking. In Gujarat, financial assistance can come through state-level support for PwDs, through the Divyang Sadhan Sahay Yojana (Gujarat Social Defence) and Sant Surdas Yojana
- The new supreme court ruling on the right of PwDs to digital accessibility should include eCooking devices.

5. **Financial mechanisms and economic empowerment**

- Pathways to support the economic empowerment of PwDs through eCooking with technologies that enable them to cook in large quantities and sell the food such as through street vending for income generation
- Sensitivity to the income levels of households with PwDs is needed
- Mechanisms to subsidise eCooking appliances and make them affordable should be given more attention

6. **Awareness and consideration of cultural factors**

- Acceptance of eCooking appliances where families are more rigid about technology use need to be considered
- eCooking appliances should be seen as tools of convenience for PwDs to cook how and when they want to
- Men and boys should be involved at the inception of programming to challenge gender norms around cooking

7. **Advocacy and awareness raising through inter-sectoral approaches**

- Actors from different sectors need to come together to bring the findings of the study to the attention of government, and with the support of leading academic institutions in the field of design in India, convey a message to policymakers that accessibility in eCooking is non-negotiable.
- Advocacy and awareness raising is key.
- Routes such as televised cooking competitions such as MasterChef should be used as platforms for promoting the inclusion of PwDs in eCooking
- Organisations such as Composite Regional Centres should be engaged and made aware of eCooking technologies, so that more PwDs can be reached by the creation of a market, which can lower prices.
- Academic disciplines like urban planning and engineering need to be sensitised to build their interest if all of these solutions are to be seen on the ground. The gap between academia and practice needs to be bridged for solutions to be implemented.

8. **Capacity building programmes on eCooking and accessibility**

- Existing capacity building and training programmes for education, skill building and livelihoods targeted towards PwDs need to have a component on eCooking. These programmes need to involve people from different sectors to break the silos
- Capacity building programmes should be supported with accessible manuals for eCooking appliances
- Training and materials should acknowledge the caregiver's dual role as users and facilitators, offering separate guidance for managing one's own fears while enabling another's independence.

- Peer demonstration through channels such as social media should be used to build confidence
- Capacity building programmes also need to be targeted towards the eCooking sector as part of awareness-raising; to give manufacturers the knowledge needed to design and include accessible features.

9. Integration of eCooking and disability into urban planning

- Urban planning needs to be seen as a critical instrument for including PwDs in eCooking
- The accessibility of electricity at a household level needs to come before the accessibility of appliances
- Kitchens need to be regarded as a critical part of access to housing and as part of a larger ecosystem to facilitate inclusive eCooking for PwDs
- Inclusive standards for kitchen design need to be integrated into the National Building Code, so that kitchens can be designed to include PwDs and facilitate their easy use of eCooking
- Existing guidelines by the Bureau of Indian standards should be reviewed, and considerations should be made as to whether specific standards are needed in relation to disability and electricity, and a separate set should be made accordingly

1 Introduction

Achieving Sustainable Development Goal 7 to provide universal, affordable, reliable and sustainable energy for all by 2030 requires the use of modern energy cooking services including eCooking technologies, as part of a transition towards clean cooking, or 'access to safer and more sustainable cooking and heating fuels and stoves than traditional biomass stoves' (IEA, 2017). This transition is critical to achieving target 7.1.2 of Sustainable Development Goal 7, to ensure universal access to affordable, clean cooking solutions by 2030. In India, facilitating access to clean cooking has been on the radar of researchers, NGOs, policymakers and state governments for a number of decades, yet an estimated 500 million people across the country continue to lack access to clean cooking solutions, causing damage to public health, the environment, and economies (IEA et al, 2025), and about 600,000 premature deaths as a result of indoor air pollution due to biomass cooking, mostly with wood (Health Effects Institute, 2020). People with disabilities (PwDs) are estimated to comprise 4.52% of India's population, or 63.28 million people (NFHS-5, 2019-21). PwDs are more likely to be confined to their home due to their health needs, inaccessible communities, and are kept 'out-of-sight' at home due to stigmatisation and discrimination (Perera, 2019). PwDs are therefore left more highly exposed to harmful indoor air pollution from smoke that comes from burning biomass cooking fuels (Bhakta et al, 2024). Innovations in conventional cooking technologies for PwDs such as microwaves, ovens and thermometers, particularly in high-income contexts, have incorporated for instance talking features, larger screens and buttons, automatic shut-off, circuit breakers, and timers (Bhakta, 2020a). Yet, little is known about how technologies can be designed and produced to include PwDs in eCooking.

eCooking, or cooking with electricity (MECS, 2022), provides an opportunity for inclusive technological innovation to include PwDs in the design of eCooking appliances. Ensuring that no one is left behind in the transition to eCooking requires consideration of the needs of different groups, including people with disabilities. Recent research from Ahmedabad in Gujarat, India (Silakari et al, 2025) identified that the energy needs of people with disabilities in India remain invisible in policy and practice. Evidence from this study has found that people with disabilities in Ahmedabad, prefer using cooking technologies that are accessible to them, but that the overwhelming majority of technologies available are largely inaccessible and not designed to their needs, and there is a lack of accessible technologies available on the market (Silakari et al, 2025). With 99.6% of India's population now having access to electricity (World Bank, 2022), the adoption of eCooking has the potential to become widespread in India, due to the range of existing devices available that could be developed to provide energy efficiency in cooking options, and the potential to increase revenue generation by building eCooking into electricity and mini-grid programmes (Rosseau and Kumar, 2020). Research in Ahmedabad (Silakari et al, 2025) has shown that PwDs have found standard LPG stoves inaccessible due to high placement and manual ignition difficulties, challenges of replacing gas cylinders,

concerns over safety when using gas due to risks of it being left on and flare up, and risks of burning. Whilst PwDs in the city continue to contend with unequal access to energy due to factors such as inaccessible built environments, rising fuel costs, dependence on energy for operating assistive devices, and limited awareness of existing government schemes, the overall electrification rate is high (Silakari et al, 2025), making Ahmedabad a unique urban context in which to explore how inclusive eCooking can be beneficial to PwDs and their caregivers.

This research project in Ahmedabad was led by Prabhat Education Foundation and Dr. Amita Bhakta (Independent Researcher) for the MECS Programme at Loughborough University. Building on Phase I of this research, Phase II has been designed to help to understand how the use of eCooking appliances affects PwD's cooking experiences, and generate evidence-based policy and practice recommendations to ensure that PwDs are not left behind in the transition to eCooking, through placing a spotlight on PwDs and their caregivers.

1.1 Aim

To generate robust, context-specific evidence on how inclusive e-cooking technologies can enhance the cooking experience, wellbeing and economic opportunities of PwDs, and to inform policy, standards and market mechanisms that ensure no one is left behind in the clean-cooking transition.

1.2 Objectives

This research has sought to achieve the following objectives, in order to generate actionable recommendations to ensure that people with disabilities can be included in the transition to clean cooking through eCooking technologies:

- Work with households with PwDs through a participatory process involving a combination of co-design workshops and home visits to identify and select 1-2 eCooking appliances to test at home
- Complete an assessment of the existing cooking space/kitchens for the households and identify modifications required to safely accommodate eCooking appliances
- Make alterations to kitchens/cooking spaces to ensure that eCooking appliances can be safely installed and used
- Test the chosen eCooking appliances to assess factors such as usability, preferences, safety etc. across different impairment groups
- Map the existing resources and support available to support PwDs to transition to eCooking
- Develop actionable recommendations for eCooking appliance design, standards, utility practice, and government policy

2 Study Setting and Methodology

This study was conducted through a participatory, inclusive, step-by-step process, which placed the needs of people with disabilities and their caregivers at the heart of the research. This section provides context about the setting of the study, Ahmedabad City, and describes the process of participatory workshops and methods which enabled the identification of evidence on how inclusive e-cooking technologies can enhance the cooking experience, wellbeing and economic opportunities of PwDs, to be used to inform policy, standards and market mechanisms that ensure no one is left behind in the clean cooking transition.

2.1 Study Setting: Ahmedabad City

Ahmedabad, the largest city in the state of Gujarat in north-west India, was the setting for this research. As the city experiences rapid urbanisation with a population of over 7.3 million (Census, 2011, projected estimates 2023), 13.1% of its residents continue to live in informal settlements or slums (CWAS, 2015), where a combination of informality, affordability and lack of adequate infrastructure shapes access to energy (Silakari et al, 2025). Ahmedabad's electricity comes from a combination of natural gas-based power plants, coal-based thermal power plants and renewable energy sources, and is distributed by the privately-owned electricity board, Torrent Power Limited[1] . The primary field sites for this study, where Prabhat Education Foundation focuses its community—based rehabilitation programmes, are low-income neighbourhoods, though a small number of participants from more affluent communities have been included in this study for comparative analysis. These neighbourhoods are characterised by shared utilities and a lack of accessible urban infrastructure, where high density of housing and poor design of electricity infrastructure are common. In many of the communities in which fieldwork was conducted, electricity supply is often unreliable, with frequent fluctuations and a lack of formal complaints mechanisms. Electricity infrastructure at a household level which is required to support the use of eCooking technologies is often inaccessible, with electrical switches and sockets often placed too high for PwDs to use without adaptive low-cost techniques such as sticks, and narrow spaces around switchboards hindering accessibility (Silakari et al, 2025). This research seeks to identify actionable recommendations for the inclusion of PwDs in eCooking, using evidence that is generated within the context of inaccessible, informal, and inadequate access to electricity infrastructure in the city of Ahmedabad.

[1] https://www.bajajfinserv.in/what-is-electricity-charges-in-ahmedabad

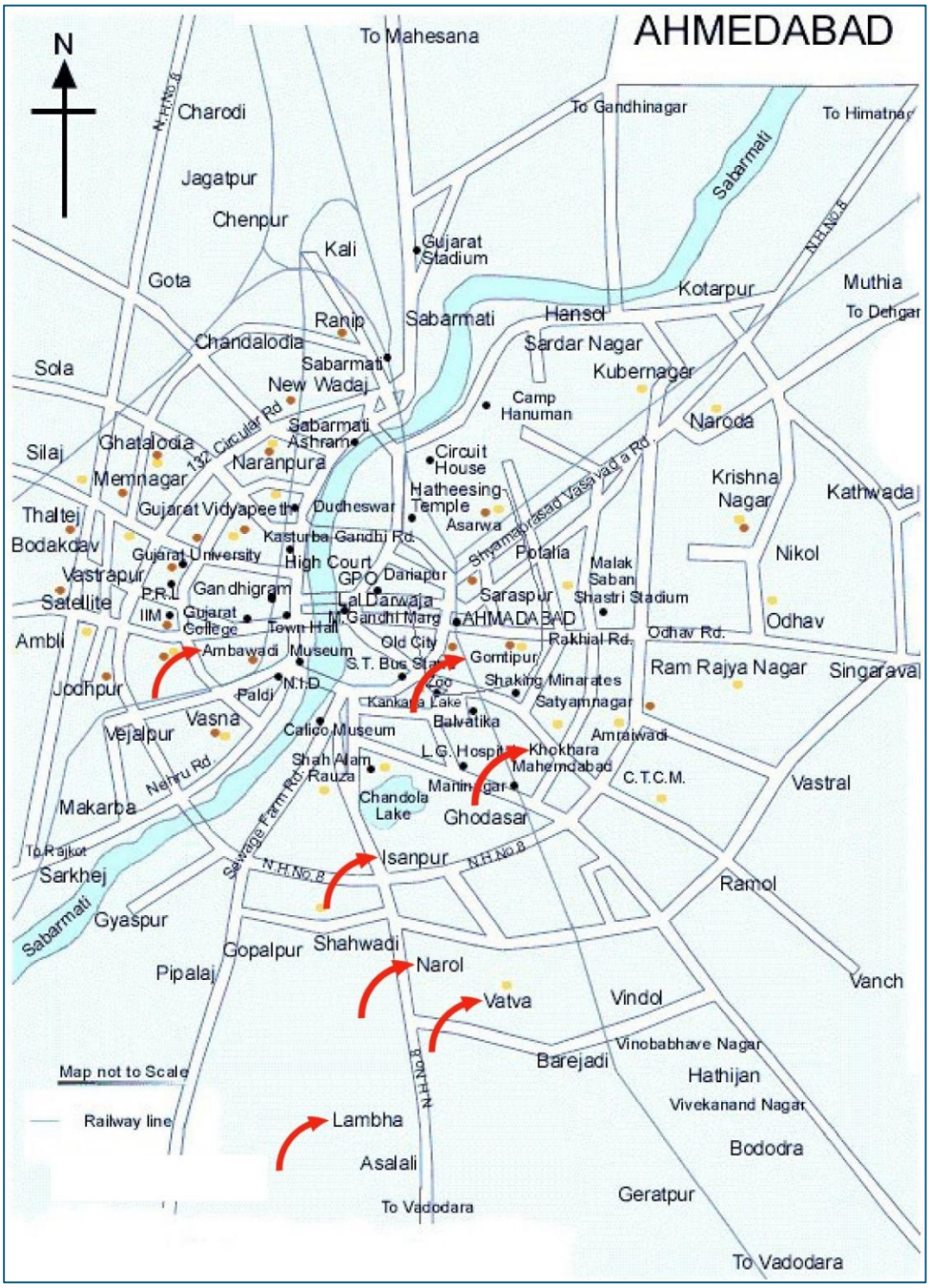

Figure 1: Map showing locations of field sites in Ahmedabad City

2.2 Participants

The research involved a diverse population of participants, to understand the usability aspects of eCooking appliances for people with different disabilities and their caregivers. Participant selection was done by Prabhat Education Foundation as the implementing partner in the field. PwDs and caregivers with access to electricity at home were selected

from Phase I, whilst professionals and institutional stakeholders were selected through a combination of prior engagement during Phase I and establishing new contacts.

2.2.1 Persons with disabilities

Adults (aged 18 and above) with visual impairments (VI), hearing impairments (HI), and orthopaedic disabilities (OD) were purposefully recruited from Prabhat's low-income intervention communities and from middle- and upper middle-class backgrounds, based on the findings of Phase I and the experiences shared by particular participants. Participants were selected to ensure representation across varied types of disabilities, income levels, and age groups, with gender being the only limiting criteria.

2.2.2 Caregivers

Caregivers (aged 18 and above) of people with intellectual disabilities (ID) and cerebral palsy (CP) were recruited for this research based on the experiences they shared during Phase I of the study. In the case of caregivers, selection was based on the severity of the disability of the person they were caring for and the level of support they were providing for the PwD that they cared for in daily activities, including cooking.

2.2.3 Professionals and institutional stakeholders

Professionals and institutional stakeholders were engaged in the research at various stages of the project. At the inception and orientation stage, experts in disability and accessible products were involved in delivering the initial workshops. At the conclusion of the study, the collective workshop included stakeholders from the clean cooking and energy sector, academia, urban planning, government bodies, private sector and disability experts, based on the outcomes of the data gathered and the expertise required to generate key recommendations.

2.3 Research process

The research took place over four months and incorporated five distinct stages (Figure 1): an orientation phase, an initial testing phase, co-design of cooking diaries, an in-depth testing phase, and the engagement of stakeholders.

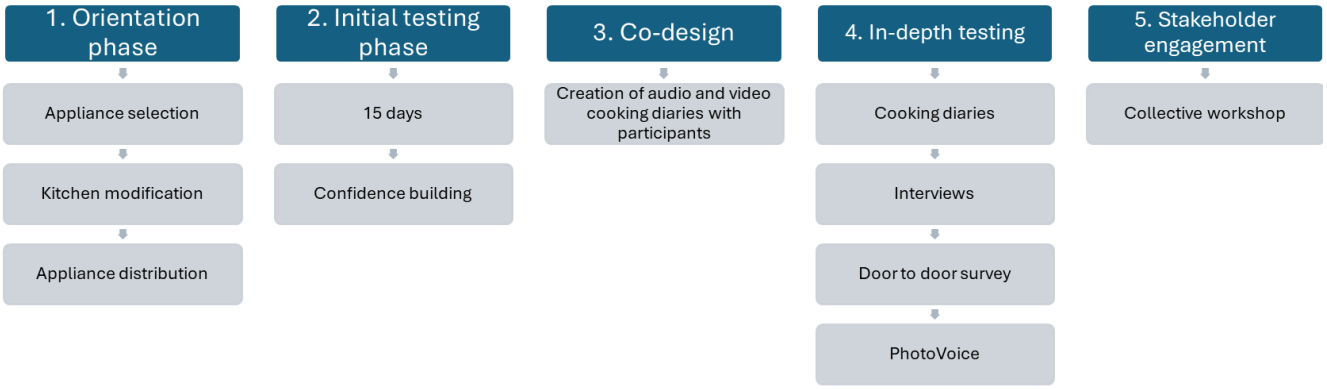

Figure 2: The Research Process

2.4 Orientation phase

2.4.1 Orientation workshop and home visits

The research began with orientation of participants to the research process, selection of e-cooking appliances, and adaptation of kitchens to accommodate eCooking appliances. At the inception of the study in October 2025, consultations were conducted with 20 participants[2] across three disability categories—visual impairment, hearing impairment, and orthopaedic challenges, along with caregivers of PwDs. Participants were from a mixture of low- and middle-income economic backgrounds. The orientation and eCooking appliance selection process was conducted through a combination of an in-person workshop held in Ahmedabad with 9 participants with the support of an expert, Nita Panchal, who was a paraplegic herself and a disability rights activist, visits to the Prabhat Education Foundation centres by 2 participants, and home visits with a further 11 participants who were unable to travel to the workshop. The workshop had representation from participants across different disability categories, ensuring inclusivity and diverse perspectives. The activities of the workshop and centre and home visits focused on enabling participants to select the eCooking appliances they wanted to try, and identify feasible, low-cost adaptations needed to be made in their kitchens to accommodate these appliances. The key components of the orientation workshop were:

- A recap and briefing on Phase I of the study.
- Detailed orientation on Phase II, with clear articulation of expectations and an emphasis on a partnership-based approach between participants and the implementing team.

[2] One household withdrew from the testing phase and did not participate in cooking diaries but did give an interview

- Participatory exercises where participants described their kitchens through sketches and drawings, helping the team understand spatial and accessibility aspects.
- Explanation of the consent process, with special emphasis on the duration and time commitment involved in the study.
- Exhibition and hands-on demonstrations of the proposed electrical cooking appliances and assistive devices, allowing participants to familiarize themselves with the equipment.

2.4.2 Drawing kitchen layouts

At the centre of the process was participatory engagement to gain a contextual understanding of each cooking environment. Building on the success of using drawing as a method with PwDs in Phase I (Keshavani, 2025), participants who were able to do so at the workshop were asked to draw the current layout of their cooking environment, to determine any adaptations needed to accommodate eCooking technologies within their kitchens. This process was guided by an expressive arts teacher who was experienced in working with people with disabilities. The layout for one visually impaired participant was drawn by the Prabhat Education Foundation field coordinator at the workshop. The kitchen layout for participants who were visited at home was obtained through photographs taken by the research team, as drawings would not have been practical to do with them due to the poor housing conditions in which they lived.

Figure 3: Drawing of kitchen layouts by participants in the orientation workshop (Photo © Prabhat Education Foundation)[3]

[3] All participants gave their consent for their photographs to feature in outputs including this report

2.4.3 Selection of eCooking appliances

A selection of eCooking appliances was demonstrated by Prabhat Education Foundation team members at the workshop and during the home visits. Participants were able to have a 'hands on' experience to understand the physical features of eCooking appliances and how they worked, and to choose up to two appliances to try. Participants were fascinated by the array of appliances on display. While many were initially drawn to appliances with multiple functions and settings, several ultimately chose simpler options such as the rice cooker, which had a single, easy-to-use setting. An induction cooktop was provided to all 19 households. In addition, six participants selected a rice cooker and four opted for an electric pressure cooker, while the remaining participants chose to experiment with assistive appliances such as a food processor, roti maker, and chopper alongside the induction. The team supported participants in selecting appliances by carefully explaining which features could ease their cooking processes and which might pose challenges given their specific disabilities. Ultimately, the final selection was guided by a combination of practical need and personal curiosity. Kitchens were modified for participants before appliances were installed, to ensure that the kitchen layout and electricity infrastructure were accessible and safe enough for people to use the appliances.

Figure 4: Demonstration of eCooking appliances by Prabhat Education Foundation staff (Photo © Prabhat Education Foundation)

Figure 5: Hands-on experiences for a visually impaired participant with eCooking technologies at the orientation workshop (Photo © Prabhat Education Foundation)

Adaptations were made to the activities of the orientation workshop to accommodate for the needs of those who could not travel to the workshop, with the aim of fulfilling the same objectives. Home visits were made to 11 participants over a period of 5 days. The focus of the home visits was to:

- Provide an orientation to Phase II of the research
- Obtain oral consent from the participants
- Provide a live demonstration of each of the eCooking appliances
- Conduct a preliminary recce of existing household electrical fittings to assess the feasibility of required modifications needed to accommodate eCooking appliances

2.4.4 Electrical modifications to households

Electrical modifications were made to all 19 households in early November 2025. These modifications within the home were critical to not only ensure eCooking appliances could be safely used, but to facilitate long-term adoption of and a transition to eCooking for PwDs and caregivers, going beyond the symbolic distribution of appliances. Spaces identified by the participants were selected for modification based on their comfort, accessibility, and convenience.

2.4.5 Appliance distribution and training

Appliances were distributed and participants were trained on how to use them through a phased process in mid-November 2025. The eCooking appliances distributed included induction cooktops, rice cookers, electric pressure cookers (EPCs) and roti makers, along with assistive cooking devices including food processors and vegetables choppers.

Hands-on training, which was tailored to the needs of each participant, was conducted at each household when the appliances were installed.

Regular follow-ups were conducted post-distribution to support participants in using the appliances. These follow-ups were primarily in person, with some conducted over phone calls as required. The focus of the follow-ups was on troubleshooting, confidence building, and encouraging sustained use.

Figure 6.1 & 6.2: Follow ups and training in the field (Photos © Prabhat Education Foundation)

2.5 eCooking Appliances Tested

eCooking appliances were tested across 18 households by 19 participants for 60 days, including an induction cooktop, rice cooker, electric pressure cooker and a roti maker. Participants were also provided with supportive electrical cooking appliances such as mixers and choppers to support their accessibility needs. **Error! Reference source not found.** Table 1 shows a summary of the eCooking appliances tested, and Table 2 shows the electrical appliances provided as supportive accessibility measures.

All households chose to test the induction cooktop at the inception of the research. Rice cookers were tested by 2 households with people with visual impairments, 2 households with people with orthopaedic disabilities, and 2 caregivers. EPCs were tested by 3 households with people with orthopaedic disabilities and 1 caregiver, who were drawn by the range of cooking options offered. A roti maker was tested by one participant with an orthopaedic disability, but was returned mid-way through the trial as she did not feel comfortable using it.

eCooking Appliance	Features	Households tested with
Wonderchef Power 1400W Induction Cooktop[4] 	● Advanced dual-layer coil to maximise efficiency and ensure even heat distribution ● Energy efficient, with reduced energy consumption and cooking time ● 11 pre-set push touch control button cooking functions which allow users to make rice, soups, stir fry, tea, and boil water at the touch of a button ● Toughened, durable, scratch resistant, easy to clean, glass top ● Manual temperature setting to adjust temperature as required ● Compact, lightweight, and portable and easy to store.	● All 18 households, across all impairments

[4] https://www.amazon.in/dp/B0CJJ2WPRV?ref=cm_sw_r_cso_wa_apan_dp_ss_91SEY9Q5K8R3HMZ18EYF&ref_=cm_sw_r_cso_wa_apan_dp_ss_91SEY9Q5K8R3HMZ18EYF&social_share=cm_sw_r_cso_wa_apan_dp_ss_91SEY9Q5K8R3HMZ18EYF

Pigeon by Stonekraft Electric 700W Ruby Rice Cooker 1.8L[5] 	• Simple functioning with just one button • Sturdy body • Cool touch handle on stainless steel lid • Slow cooking to preserve nutrients • Auto-off feature to prevent overcooking and risk of burning • Keeps food warm for 4-5 hours • Comes with spatula and measuring cup • Click sound to signal that food is done	• Visually impaired (VI) households: 2 • Orthopaedic disability (OD) households: 2 • Caregivers: 2

[5] Buy Pigeon by Stovekraft Ruby Rice Cooker with Single pot, 1.8 litres.(Red) | Toughened Glass Lid | 700 Watts | 1 Aluminium Cooking Pot | Measuring Cup| Spatula | Energy Efficient Cooking Online at Low Prices in India - Amazon.in

Pigeon By Stovekraft Electra Smart 6 Litre Electric Pressure Cooker[6] 	• 18 pre-set menus including for Indian dishes such as biryani, khichdi, idli, chana/rajma, dal • Automatic pressure and temperature control, which helps to avoid constant monitoring • Advanced built-in safety features, like lid lock (won't open under pressure), auto shut-off, pressure/temperature sensors • Auto-off feature to prevent overcooking • Keep warm function to keep food warm until it is served • 'Set and forget' function to avoid the need for monitoring • Flexible manual controls for time and temperature adjustments • Easy to clean stainless steel pot	• OD households: 3 • Caregivers: 1

Table 1: eCooking appliances tested across the sample (Photos: Prabhat Education Foundation)

[6] Pigeon By Stovekraft Electra Smart 6 Litre Electric Pressure Cooker Instruction Manual

Electrical appliance	Features	Households tested with
Bajaj Food Factory FX 11 600-Watt Food Processor (White) 0.3L[7] 	• 3 speed control and pulse function with stop and start facility for momentary operation • Safety lock • Useful for efficient processing, grinding, liquidising, juicing and kneading atta (dough) • Includes polycarbonate processing bowl with lid • 1.5 litre unbreakable polycarbonate liquidising jar with stainless steel blade • 1.0 litre stainless steel grinding jar with multi-function stainless steel blade • 0.3 litre stainless steel chutney jar with stainless steel blade • Stainless steel blades for chopping, slicing, kneading, shredding, coconut scraping and a French Fries function	• VI households: 2 • Hearing impaired (HI) households: 2 • OD households: 4

[7] https://magnuscadeaux.com/index.php?route=product/product&product_id=4677

National Exclusive 250-Watt Electric Vegetable Chopper with Double Blades[8]  	● Push button on the top to make it easy to operate. The longer the button is held, the finer ingredients are chopped. ● High RPM motor for fast chopping using dual blade system that cuts from top and bottom ● Transparent jar	● OD households: 1

Table 2: Electrical appliances provided to support eCooking (Photos: Prabhat Education Foundation)

[8] https://atozhomeappliances.com/products/national-exclusive-250-watt-electric-vegetable-chopper-with-double-blades-color-multi

2.6 Initial testing phase

An initial testing phase was held during which participants had the opportunity to get used to using the eCooking appliances over a period of 15 days. During the initial testing phase, regular follow-ups were conducted by the team. These follow-ups were primarily in person, with some conducted over phone calls as required. The focus was on troubleshooting, confidence building, and encouraging sustained use.

2.7 Co-design and creative workshop and follow-up home visits

The second workshop was held in November 2025 and focussed on co-designing cooking diaries and understanding the lived experiences of PwDs as they transitioned to eCooking appliances (induction, rice cooker, electric pressure cooker, roti maker) with the support of additional supportive appliances such as food processors and choppers. The workshop was supported by Dr. Homiyar Mobedji, an accessibility and assistive technology expert, and a sign language interpreter. The workshop's objectives focussed on:

- Understanding participants lived experiences with the appliances after initial usage.
- Facilitating peer-to-peer learning, where participants shared tips, challenges, and adaptations.
- Co-designing cooking diaries as a documentation and reflection tool.

The workshop was split into two sessions. The first session focused on gaining a snapshot of initial and early experiences of eCooking. During this session, participants including visually impaired individuals and people with orthopaedic disabilities who were at the workshop shared their initial experiences with the eCooking technologies they were using, through an open discussion.

Figure 7: Discussions with participants in the co-design workshop (Photo © Prabhat Education Foundation)

In the second session, the workshop moved into collaborative design, asking participants how they would prefer to document their daily cooking experience. Consultations about the co-design of a cooking diary began at the workshop and were followed through on a one-to-one basis with all participants in the following days after. Following this consultation and the sharing of audios and videos by participants, an audio or video diary was co-designed as the most accessible measure for all.

Figure 8: Interactions with participants about the way forward after the workshop (Photo © Prabhat Education Foundation)

After the workshop, follow up home visits were conducted to resolve technical issues raised during the session, including E4 errors on EPCs and the locking of food processors. The workshop was also followed by more hands-on training at home, the creation of simple, Gujarati-friendly tutorial videos explaining button functions, the finalisation of the audio and video cooking diary, and the continued capturing of stories of empowerment, innovation, and challenges to inform the wider study.

2.8 In-depth testing phase

Following the co-design workshop, the in-depth testing phase with the 18 households was conducted over a period of 60 days. During the in-depth testing phase, as households with PwDs and caregivers continued to use the eCooking appliances, a combination of methodologies was used to understand their experiences, including:

- Cooking diaries
- A door-to-door survey
- PhotoVoice
- Semi-structured interviews
- Learning and sharing through WhatsApp

These tools were supported by a pragmatic follow-up process undertaken by the team on the ground throughout the testing phase. Flexibility in the approach and empathy towards the circumstances of each participant were critical in ensuring the day-to-day process of data collection went smoothly.

Flexibility: The Key to True Participation

While the study generally encouraged full family participation, Savitriben's (visually impaired) journey required a more personalized approach to accommodate her unique role as a working professional and an advocate. As the Secretary of the Blind Women's Association, her participation was vital, as she represented the collective voice and future guidelines for many women with visual impairments. Despite initial skepticism from her family and a demanding travel schedule that made regular use of the study tools difficult, the research team adapted by prioritizing her individual situation. By offering flexible follow-ups and adjusting the procedures to suit her convenience, the study successfully reduced her burden while honoring her commitments. Ultimately, Savitriben's experience highlights the importance of empathetic research strategies: understanding that true inclusion requires adapting to a participant's life rather than forcing them to fit a rigid protocol.

(Photo: Prabhat Education Foundation)

2.8.1 Cooking diaries

Cooking diaries were conducted with all participants following a co-design and consultation process. Discussions following the co-design and creative workshop over time led to the creation of three formats of cooking diaries, which collectively catered for different participants' accessibility needs. Many of the participants were independently sending self-recorded videos to the research team at the start of the trial period as they became familiar with the eCooking technologies, whilst others were sharing audio notes by mobile phone, leading to the creation of audio and video diaries, the recordings for which were shared with the team through WhatsApp. Participants who were unable to record themselves were called by phone every 2-3 days in the form of 'telediaries', and the conversation was recorded. The cooking diaries were conducted over a period of 10 days with recordings made every other day, reflecting on the previous two days of cooking. Participants were asked to share a short reflection on what they cooked over the past couple of days, who they had cooked for, how they felt as they were using eCooking appliances to make their dishes, reflections on the specific features they had used and why they used them, features of the appliances that made it easier or challenging to cook in the context of their disability and why, and any reflections on taste. A blog on the cooking diaries process adopted in this research is available here (Bhakta, 2026).

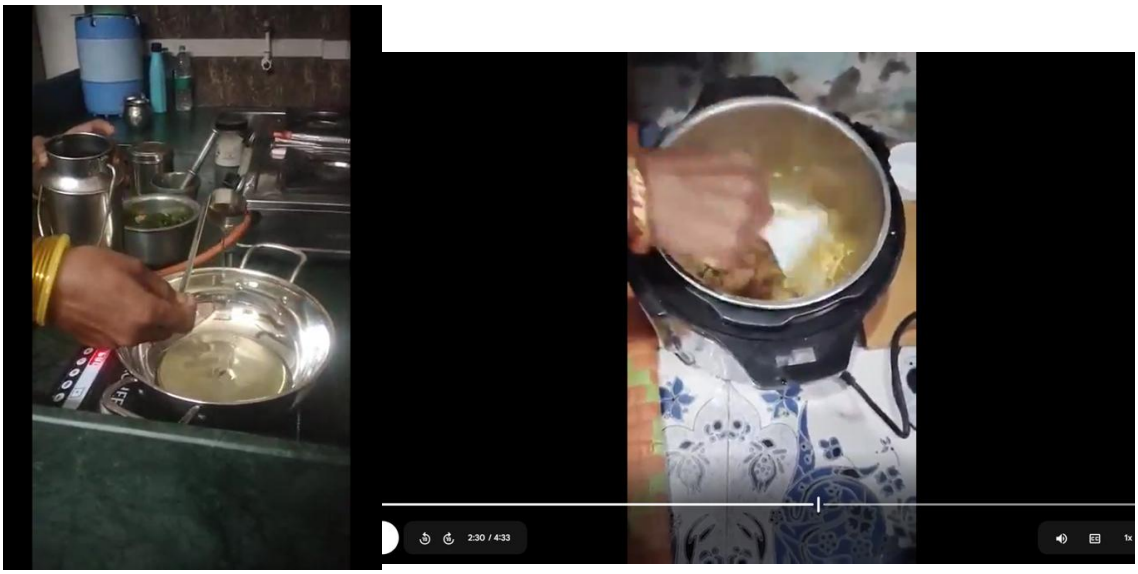

Figure 9.1 and Figure 9.2: Screen shots from video diaries recorded by participants (Figure 9.1 © Kalaben Vaid, Figure 9.2 © Geeta Patel)

2.8.2 Door-to-door survey

A door-to-door survey was conducted with participants to understand their reactions and experiences of eCooking over two rounds through a phased process. The first round of the survey focused on understanding: how familiar participants were with the eCooking technologies they were using, who usually cooks in the household, who has been the first to adopt and use the eCooking appliances in the household, initial emotional

responses and thoughts as they began to use the appliances, family reactions to receiving the appliances, experiences of assembly, set up and early use, and to record observations by the research team regarding the ergonomics of how users are using it.

The second round of the survey delved deeper into the usability of the eCooking appliances, any adaptations made, and overall reflections on eCooking experiences. The second round was conducted later towards the end of the in-depth testing phase, focusing on: overall usage patterns, the perceived safety and accessibility of eCooking technologies, , the financial impact of eCooking on the household, the impact of eCooking on the individual, overall feedback on the eCooking appliance design and suggested improvements, and whether they would recommend the eCooking appliances to others in a similar situation. The surveys were supported by informal discussions as they were conducted, generating qualitative data to support the quantitative findings, given the overall small sample size.

2.8.3 PhotoVoice

PhotoVoice (Bhatt et al, 2025; Bhakta, 2020b), or participatory photography, was conducted with five participants with disabilities to document their eCooking experiences through photography. PwDs were asked to consider five things that made them happy about using eCooking and supportive cooking technologies, and five things that they found more challenging. Four participants took part in one session, and one participant took part in an additional session to explore gaps identified in the first session. Topics of interest were prompted as needed during the process, such as:

- What they enjoy or dislike about using these technologies and why
- Features such as buttons, screens and sounds they may like or dislike and why
- Dishes that they have found easier or harder to cook with these technologies
- Any features in their kitchen that have helped, or prevented them from using eCooking technologies in the way that they would ideally want to, or that they wish to have improved

PwDs were given the opportunity to choose:

- Whether they wanted to take the photos themselves or direct us to do so.
- Which aspects of eCooking they wanted to highlight.
- Whether they wanted their faces to be visible in the published images.
- Whether they wanted their own name to be attributed with the photos, which remain their copyright images, or a different one

The photographs were either printed in a local print shop or shown on a laptop where printing was not feasible and then presented to participants. Participants were then asked to caption each photograph in the form of a short story.

Figure 10: PhotoVoice activity in the field (Photo © Prabhat Education Foundation)

2.8.4 Interviews

Two rounds of semi-structured interviews were conducted with people with disabilities and caregivers. The first set of interviews aimed to gather participants' reflections on the start of their eCooking journey. The first set of interviews focused on initial experiences of eCooking. Participants were asked to reflect on: their first impressions of eCooking, the accessibility of the eCooking appliances, affordability and support mechanisms to transition to eCooking, and recommendations for including PwDs in eCooking. The second round of interviews aimed to provide participants' overall reflections of their eCooking journey, including on: the design of appliances, the roles that their families had to play as they transitioned to eCooking, aspects of eCooking that felt easier or harder by the end of the trial, barriers faced, financial implications, and whether they would continue to use the eCooking appliances over the long term.

Most interviews were recorded by digital recorder and transcribed. In the second round of interviews, participants had their interviews recorded by a professional videographer, to support the creation of four multimedia vignettes.

2.8.5 Learning and sharing through WhatsApp

A WhatsApp group (Figure) was formed with all participants to enable continuous engagement. The response to this platform was encouraging and organic. Participants regularly shared:

- Audio clips describing what they cooked each day.
- Experiences of trying new recipes.
- Informal feedback and peer encouragement.

This group gradually emerged as a living, participant-led space of learning and sharing, and inspired the eventual development of the audio, video and telephone cooking diaries.

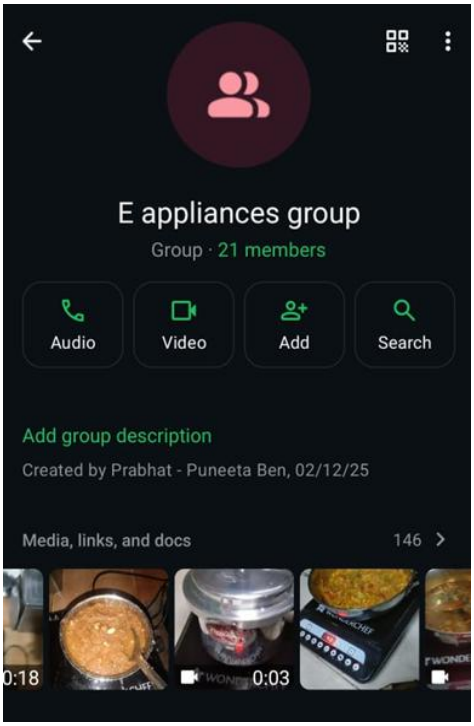

Figure 11: The WhatsApp group set up with research participants (Photo: Prabhat Education Foundation)

A participatory and collaborative model was at the heart of the study. Along with engaging participants through dedicated workshops, the WhatsApp group was a critical factor in creating a platform for collective reflection. This allowed participants to share lived experiences, fostering both direct and indirect progress through peer support.

2.9 Summary of Sample Size by Distribution Across Methods

This research draws on data gathered through mixed methods including interviews, surveys, PhotoVoice, drawings, cooking diaries, and participatory workshops, which were used in this study to engage with participants across different parts of Ahmedabad City. The study was largely focused on low-income areas, with engagement with a minority of middle and upper middle-class participants to enable a degree of comparative analysis. The research was conducted with PwDs, caregivers, and professionals.

PwDs and caregivers came from various locations of the city, including: Ambawadi, Bhaipura, Gomtipur, Isanpur, Lambha, Narol, Shahwadi, and Vatva. The research brought individuals with visual, hearing and orthopaedic (including cerebral palsy) impairments, along with caregivers of PwDs, onto a single, unified platform. Typically, support groups are segregated by specific impairments; however, working toward a common goal allowed for cross-disability interaction, providing a holistic understanding of disability and strengthened community social capital.

The sample of PwDs and caregivers were mostly women, with only one male participant who took part as part of a single household alongside his wife, despite efforts to recruit more men and achieve a greater gender balance among the sample. This reflects findings from Phase I (Silakari et al, 2025) which identified that women with disabilities in

Ahmedabad are the primary managers of energy needs in the household, and that they are overwhelmingly more responsible for cooking in households with people with disabilities, irrespective of whether they are a caregiver or whether they have a disability themselves. 19 households with 20 participants were initially recruited, however one household withdrew from the research before inception of the cooking diaries.

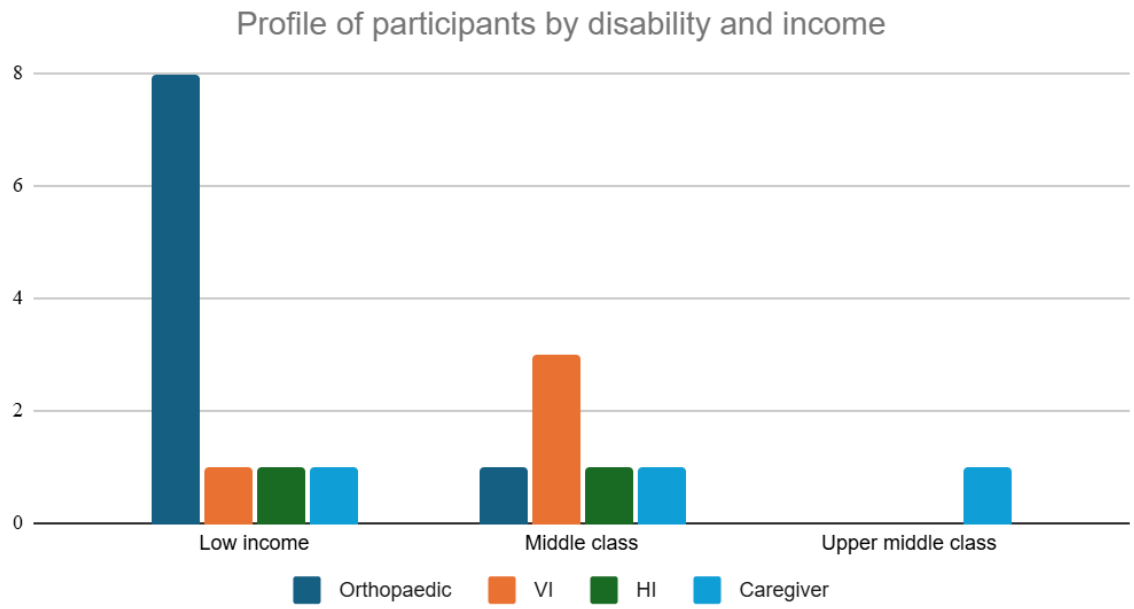

Figure 12: Sample of PwDs and Caregivers by disability and income

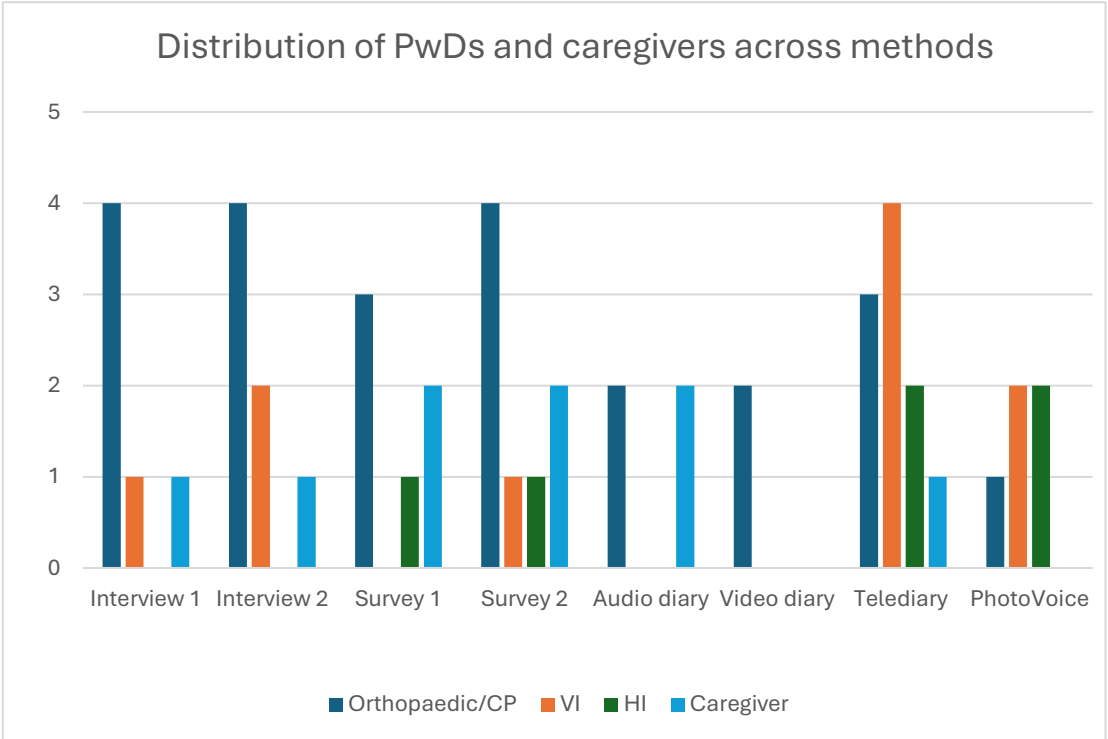

Figure 13: Distribution of PwDs and Caregivers across methods

Figure shows the distribution of the sample across the different methods used to capture the eCooking experiences of PwDs and their caregivers. In total, 18 households with 19 PwDs and caregivers took part in the study. Over the two rounds of interviews, participants were selected for the second interview according to the emerging data from the cooking diaries, interviews, and gaps to follow up on. 19 PwDs and caregivers took part in the research as follows:

- Semi-structured interview 1: 6
- Semi-structured interview 2: 7
- Survey round 1: 7
- Survey round 2: 7
- Audio diary: 4
- Video diary: 2
- Telediary: 10
- PhotoVoice: 5

All PwDs and caregivers took part in the cooking diaries, and worked with the research team to choose whether audio (4), video (2), or telediaries (10) were most suited to their needs. Semi-structured interviews were conducted with PwDs and caregivers, with the first round of interviews involving 6 participants to look at initial experiences and the second round of interviews involving 7 participants to evaluate the entire process and fill gaps. 4 of the second round of interviews were conducted on video to facilitate the creation of video multimedia vignettes. 7 participants were included in each of the two rounds of the survey. PhotoVoice was conducted with 5 participants, one of whom took part in two sessions to deepen the data .

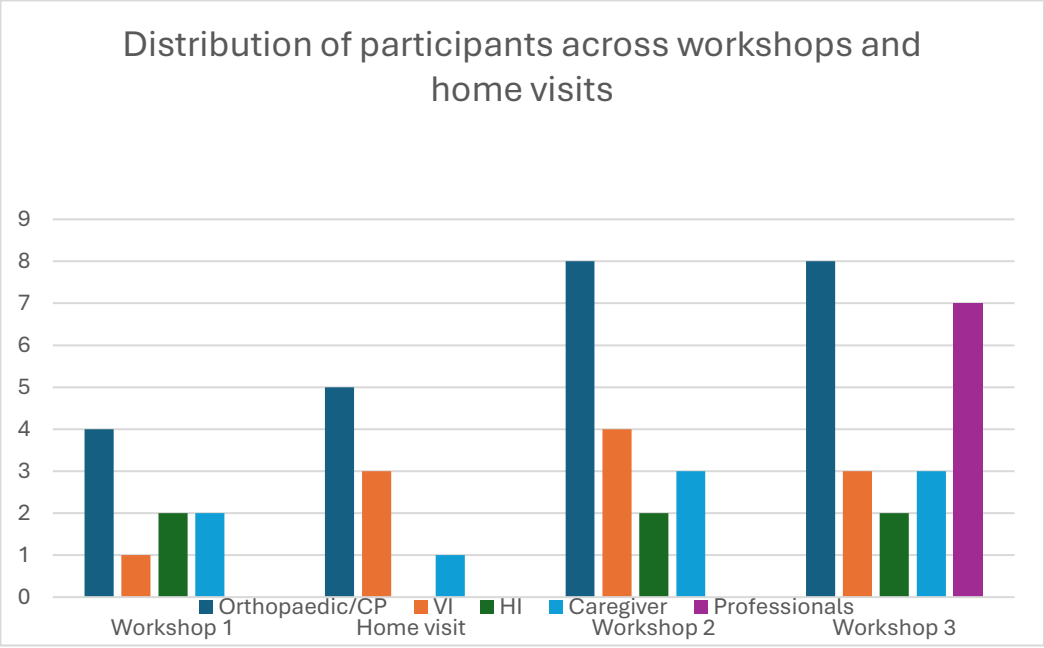

Figure 14: Distribution of participants across workshops and home visits

PwDs were engaged in a mixture of workshops and home visits as part of the research (Figure 14). Workshop 1 with 9 participants and 9 home visits sought to achieve the same objectives of determining existing kitchen layouts and adaptations required to accommodate eCooking appliances, through a mixture of drawings, observations and photographs. Workshop 2 engaged 18 participants, focusing on the co-creation of the cooking diaries, and learning and sharing of initial experiences. Workshop 3 involved 13 PwDs, 3 caregivers, along with 7 professionals, who were engaged in a panel discussion to support the generation of recommendations to include PwDs in the transition to eCooking. There were two additional participants in workshop 3 who were not a part of the main sample, who played a supportive role for PwDs.

2.10 Technical Support

Technical support and the maintenance of infrastructure was a critical component of the research that was ongoing throughout the study. Given that the project introduced electrical equipment, technical breakdowns and operational incidents were inevitable. Since local repair facilities for such specialized devices are often unavailable, providing timely guidance and establishing a reliable maintenance system became a critical component of ensuring the intervention's success.

2.11 Collective stakeholder workshop

The workshop *Accessible Energy, Everyday Independence* marked the culmination of a 1.5-year action research journey across Phase I and Phase II, exploring the intersection of disability, energy access, and e-cooking appliances. Convened by Prabhat Education Foundation and independent researcher Dr. Amita Bhakta, as the Principal Investigator, the workshop aimed to share findings from the field, foreground lived experiences of PwDs and caregivers, and initiate dialogue with policymakers, manufacturers, academics, and civil society actors.

The workshop was designed not as a dissemination-heavy academic event, but as a participatory space for reflection, learning, and collective sense-making bringing together study participants, families, peer organisations working on disability, government representatives, energy sector experts, design experts, funders, and fellow researchers.

The primary objectives of the workshop were to:

- Share findings and lived experiences emerging from Phase I and Phase II of the research
- Centre participants as experts of their own lives and cooking practices
- Surface systemic gaps in energy access, appliance design, policy, and infrastructure
- Initiate conversations around scaling, policy integration, and universal design

- Situate e-cooking and disability within broader development frameworks, including the Sustainable Development Goals (SDGs), particularly SDG 7 (Affordable and Clean Energy), SDG 3 (Good Health and Well-being), SDG 5 (Gender Equality), and SDG 10 (Reduced Inequalities)

Accessibility accommodations were built into the process. An Indian Sign Language interpreter supported deaf participants, and writers assisted individuals who could not read or write, ensuring inclusive participation. A PhotoVoice and art exhibition, which showcased photos and drawings from Phase I and Phase II was also held.

Figure 15: Participant posing with her photo at the PhotoVoice exhibition (Photo © Prabhat Education Foundation)

The workshop centred on the lived experiences of participants and their encounters with eCooking. Participants with orthopaedic disabilities, visual impairments, cerebral palsy and those who were deaf and blind shared their experiences through an open forum discussion. Certain participants took to the stage to share their stories, sparking a convivial discussion on pathways forwards towards inclusive eCooking.

Figure 16:: Dr. Amita Bhakta provides her reflections at the collective stakeholder workshop (Photo © Prabhat Education Foundation)

A panel discussion was held with the aim of generating actionable recommendations for policy and practice. The panel discussion brought together diverse voices, including manufacturers of customized appliances for persons with disabilities, representatives from academia, healthcare professionals, clean energy advocates, disability rights activists, civil society leaders, an urban planner, and study participants, including a caregiver. It included a rich exchange of perspectives across sectors, highlighting both practical innovations and systemic challenges.

2.12 Data analysis

Qualitative data was analysed using an inductive coding process within NVivo 11. Qualitative data was manually coded within NVivo. A combination of qualitative analysis and descriptive statistics were used to analyse and present survey data, due to a small sample size.

2.13 Ethical considerations

Ethical approval for this research was obtained before fieldwork began from the Independent Research Ethics Committee (IREC) in the UK (https://www.irec.org.uk/). The research followed IREC's seven ethical principles of intersectionality, justice, dignity, respect, fairness, honesty, and care.

The study was shaped by **intersectionality** at its core. The interdisciplinary team from Prabhat Education Foundation, who led the research on the ground, had backgrounds in development studies, gender, culture, and social work, who brought valuable

perspectives and lived experiences from Delhi, Karnataka and Gujarat. Dr. Amita Bhakta, who gave steer to the research, is a British Gujarati woman with cerebral palsy and an interdisciplinary background spanning sanitation, gender, and geography. The recruitment of participants acknowledged that disability in India is compounded by other social factors such as gender, caste, literacy, economic status, and age. These intersecting dimensions of identity often deepen marginalisation, particularly when paired with cultural perceptions of disability and poverty, and were actively considered when recruiting participants. The engagement of professionals in workshops as part of this research also reflected a diversity of backgrounds to shape the recommendations that emerged.

All participants had a **right to withdraw** at any time, and their data was checked with them to ensure that it was accurately quoted. The **copyrights** to PhotoVoice and drawings included in publications from this research **remain with participants**, hence their original names are used in publications to ensure proper copyright and attribution.

In line with the scope of the MECS programme, the data emerging from this study will be used **fairly, lawfully and transparently**. Participants were **informed** about the ways in which **data would be anonymised and presented** in all outputs from the research including in blogs, multimedia outputs, workshop materials, and this report. All participants **gave permission for their photos to feature** in outputs. Care was taken to ensure that data was **accurately translated** from Gujarati and Hindi to English, which will be **held on password protected computers and will not be stored for more than two years.**

Participants were **free to participate or withdraw at any time** which ensured that their **dignity** was upheld. Measures were taken to ensure that participants were comfortable sharing their views, and that their contributions were fully recognised through small tokens of appreciation. All data collection took place in environments where participants felt safe, mostly in their homes or through workshop environments.

Consent for the study was obtained through a **consent form** (Appendix B) which was translated into Gujarati and Hindi. An **additional consent form for PhotoVoice** (Appendix C) was used to enable participants to state how they wanted their photos to be used.

3 Results

3.1 Reconfiguring Kitchens to Provide eCooking Appliances a place at Home

PwDs' and caregivers' kitchens needed to be adapted in order to accommodate eCooking appliances. The orientation workshop and initial interactions through home visits

identified a range of challenges faced by people with different disabilities with the layout of their kitchens, through drawings (Figure 17, Figure 18 and Figure 19).

Kitchen layouts were overwhelmingly inaccessible and required adaptation to facilitate the use of eCooking appliances and to ensure comfort, accessibility and safety for PwDs, caregivers, and their families. The drawings and home visits identified that participants who were visually impaired faced challenges in their kitchens with a dependence on the use of gas cylinders, unsafe wiring, and difficulties with organising and accessing kitchen spaces. Refilling gas cylinders was time consuming and expensive. Ten participants, who had orthopaedic disabilities, highlighted restricted mobility, weak grip, and difficulty standing for long durations as primary barriers to cooking in their kitchens. People with orthopaedic disabilities required accessible shelves and water storage units to enable greater independence, along with accessible plug points to use EPCs and induction cooktops comfortably. Interviews identified how some households had a desire to fully transition to eCooking, but having only one plug point for the entire house prevented them from doing so. One participant shared how they did not feel safe in using electrical plug extension leads due to fears over safety and current electricity loads. Well-placed plug points were also critical for participants with weaker hand grips, who wished to use food processors for chopping and kneading dough to support them as they became more familiar with EPCs, rice cookers, and induction cooktops. Additional platforms and shelves enabled participants with orthopaedic disabilities to keep their induction cooktops within reach, use rice cookers at their convenience, and to maintain safe and efficient cooking routines.

Plug sockets were often lacking. Unsafe existing wiring and weak walls were key challenges to consider when kitchens were being modified in households with people who were visually impaired. Space allocation in the kitchen was confusing for participants with visual impairments, particularly when multiple family members were using the kitchen. Participants with visual impairments faced challenges with food preparation in their existing kitchens, particularly with chopping, making rotis, and fire safety when working around children. One hearing-impaired participant noted that her kitchen platform was low, and that poor ventilation in the kitchen made cooking uncomfortable. Another hearing-impaired participant did not identify any modification needs.

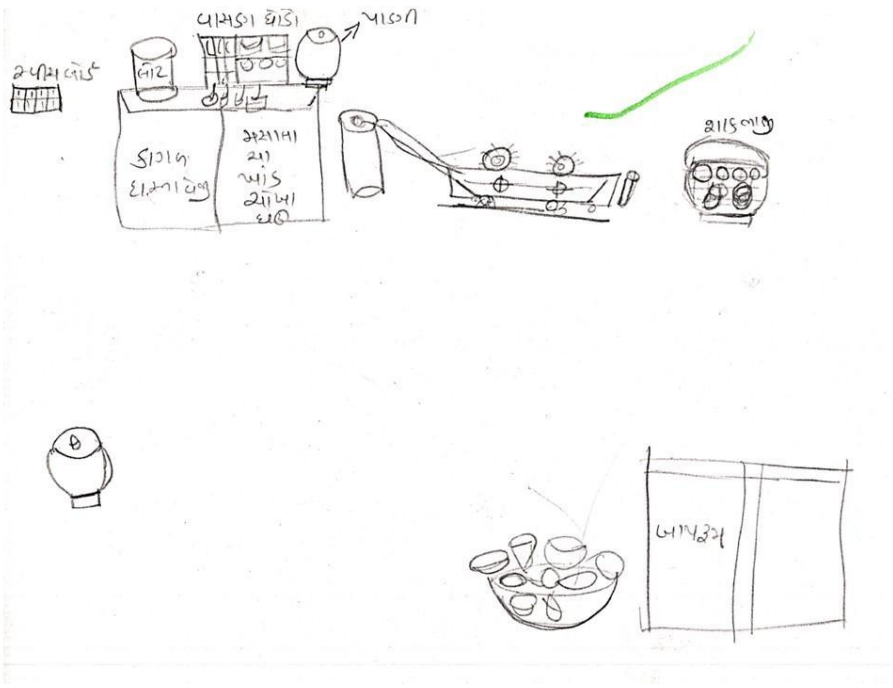

Figure 17: Kitchen layout sketch highlighting shelving challenges by participant with orthopaedic impairment (Drawing © Arunaben Rathod)

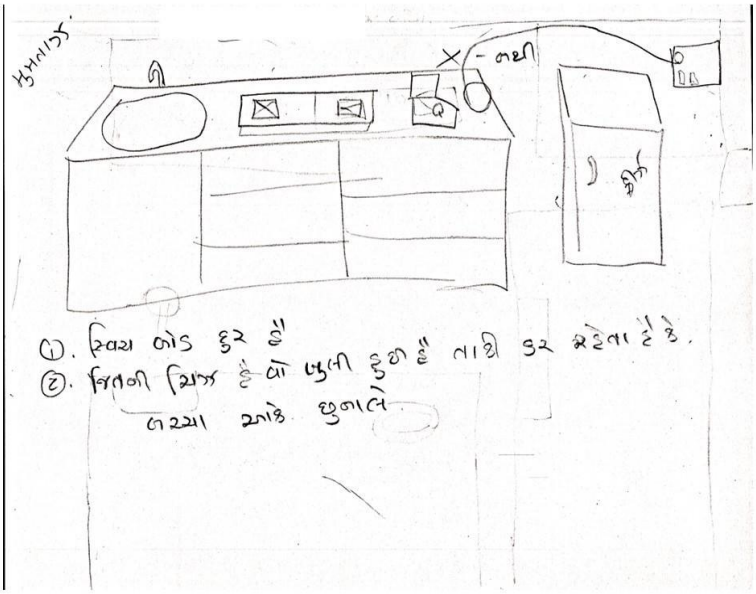

Figure 108: Sketch of a caregiver's kitchen, highlighting how the existing switchboard was far from the cooking area, and shelves were low, allowing her children with disabilities to reach potentially dangerous items (Drawing © Mumtaz Mohammad Hanif Sanghi)

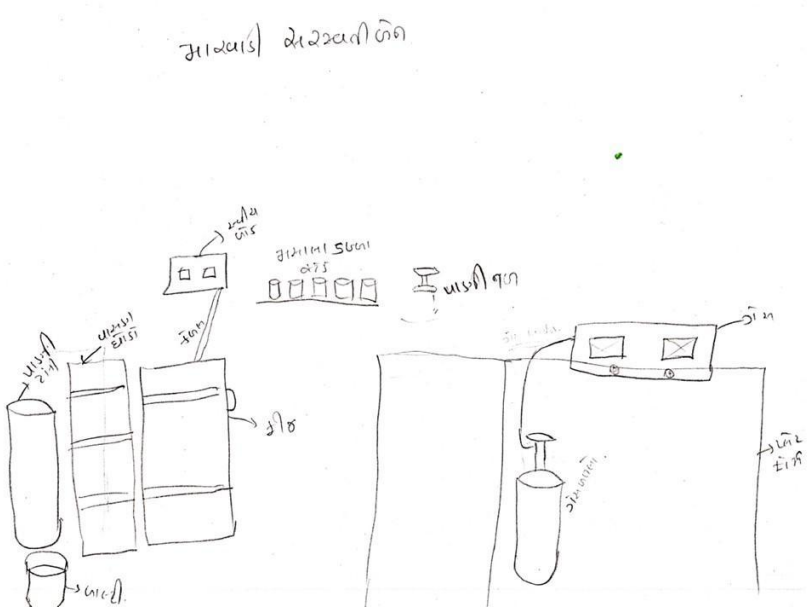

Figure 19:: A sketch highlights how a kitchen layout can be confusing for people with visual impairments (Drawing © Saraswati Dhanjibhai Marwadi)

Following the workshop and household visits, simple kitchen modifications were made at the start of the study before appliances were installed. Table 3 provides an overview of the adaptations made to participants' kitchens; to address the challenges they identified with their kitchen layout and to accommodate eCooking appliances:

Type of Modification	**Purpose of Kitchen Modification**	**Number of Participants**
Plug point installation	To enable use of induction, rice cooker, or food processor safely and conveniently.	14
Shelves (accessible or organized)	For organizing utensils and keeping items within reach or out of children's access.	7
Platform/table adjustment	To keep induction or appliances at a reachable height for seated or floor cooking.	5
Customised storage (basket/water unit)	To store vessels or water accessibly without heavy lifting.	2
Exhaust fan /ventilation improvement	To reduce heat and improve air circulation during cooking.	1
Switchboard installation/ relocation	To make appliance controls more accessible.	1
Higher shelves for child safety	To prevent children with intellectual disabilities from accessing unsafe items.	1

Table 3: Kitchen modifications made to accommodate eCooking appliances

Most adaptations were to ensure greater accessibility in eCooking, the most transformative of which was simply one plug point away. The majority of households (14) required a plug point to either be installed or lowered to a more accessible height than the existing ones, whilst others had a need for switchboards to be relocated or installed, reflecting the prevalent challenges around inaccessible electricity infrastructure in many households in Ahmedabad, as identified in Phase I (Silakari et al, 2025). PhotoVoice (Figure 20)Figure identified that lowering plug points also had the additional benefits of ensuring safety of children as well as making them reachable for PwDs, if they were at the appropriate height.

Figure 20:: "I like the placement of the plug point, as it allows me to easily connect the appliances and also it is positioned high enough that my son cannot reach it." (Photo © Saraswati Marwadi)

One participant's (OD) story demonstrated how something as basic as an unreachable plug point can limit independence, and how these small access fixes can create big shifts in daily lives, in activities including cooking and beyond. After this simple issue was resolved, she described a "sense of freedom", a powerful reminder of how micro-barriers can disproportionately affect PwDs and how removing them enhances dignity and participation:

> *"The other change, though minor that has made a noticeable and impactful shift is my accessibility to a plug point at home. I was a part of Phase I of this research, & one of the major challenges I had faced in my cooking process was the unreachability of the plug point due to my disability. Each time, I wanted an access to it, I had to*

wait for one of my children to come home and help me put the cord of any machines into the plug point. However, the fact that the team was able to fix that issue so neatly is going to be of huge help in my future. There is a sense of freedom I feel in being able to do things the way I want now that I have an access to the plug point."
(Woman with orthopaedic disability, workshop 2)

The installation of shelves which were more organised and accessible was key to supporting participants, particularly those with visual impairments, to better organise their kitchen and to support with placements of key objects required when cooking. Higher shelves were also needed by caregivers to ensure that their children with intellectual disabilities could not access items that were unsafe. Platforms were constructed for people with disabilities to be able to use eCooking appliances at a comfortable height that was reachable according to whether they sat down or stood whilst cooking. Customised storage units were provided to store vessels and water more comfortably. The installation of exhaust fans and improvements to ventilation in the kitchen helped to reduce the level of heat experienced and to improve air circulation whilst cooking.

A notable pattern across households was participant-led infrastructural adaptation. These micro-infrastructure adaptations indicated commitment to long term adoption beyond the testing period. Participants installed plug points, added wooden counters, stools, or tables to accommodate the appliances at their own expense, reflecting a sense of ownership of the appliances as well as of the research process, and represents psychological investment, perceived long-term value and early markers of integrating eCooking into domestic routines.

However, even after kitchens had been modified, some challenges with accessibility remained. PhotoVoice revealed how a deaf and mute woman faced challenges with the layout of her kitchen even after a plug point had been installed, because she had continued to use gas for cooking certain dishes and had not fully transitioned to eCooking. This illustrates a challenge for eCooking to become part of a multi-fuel clean cooking strategy, with the continued use of biomass reflecting the long-term journey to eCooking undertaken by people irrespective of whether they have a disability.

Figure 21: "Both the gas and induction are in different places. If all the equipment was in one place, I would be able to use it even better." (Photo © Sheelaben Bhoi)

3.2 Initial Encounters with eCooking for PwDs and Caregivers

eCooking was a new experience for most of the participants. The data revealed a variety of emotions and experiences as both PwDs and caregivers familiarised themselves with the appliances.

3.2.1 PwDs

PwDs often began their eCooking journey with some degree of anxiety and fear. One participant with an orthopaedic disability reflected on her fear that using her own vessels with an induction cooktop could cause 'earthing' (electric shock) and required assurance from the research team that induction-compatible appliances should be used instead of her existing ones to meet her family's needs. PhotoVoice (Figure 22) identified how a deaf and mute participant was concerned about the placement of her induction cooktop near to the fridge:

Figure 22: "Initially, I was afraid to use the induction cooktop as the cooktop and the fridge were right next to each other. I thought it might short circuit and I wouldn't be able to make a sound. But then when I used it, I moved both of them away. So now I can cook without any fear." (Photo © Sheelaben Bhoi)

Overcoming fear was a key part of the process, often manifesting in multiple ways. PwDs had initial fears about the impact of eCooking on their electricity bills, and how they would use EPCs and induction cooktops in the early days of the study, often fearing whether things would go wrong. As one woman with an orthopaedic disability described, she only used the eCooking appliances when she was alone, to build up her confidence:

> *"The first week was full of panic. I kept thinking, "What if I break it? What if there's a short circuit?" If something goes wrong, people in the neighborhood will start talking. If I mess up, they might point to my disability and doubt my competence. That's why I prefer to use the appliances when I am alone. If I mess up then, there's no accountability, and I can build my confidence in private before cooking for others."* (Woman with orthopaedic disability)

Mixed feelings and self-doubt shaped early experiences of eCooking:

> *"I had mixed feelings, both nervous and excited. I doubted my own ability to manage it. I worried whether I would understand the mechanics. Once I gave it a few shots, things improved."* (Woman with orthopaedic disability)

In many cases however, initial fear and anxiety was replaced with self-confidence, as participants became proactive in identifying solutions to the problems that they were

facing during the study. As one couple, who both had orthopaedic disabilities and who cared for each other, described, their anxiety was compounded when they encountered a technical issue during the first use: the EPC failed to turn on properly. However, rather than giving up, they sought solutions by watching instructional videos on YouTube. Once they had managed to fix the issue independently, their fear was immediately replaced by confidence. Since that moment, they have integrated the appliances into their daily routine without further issues. Family members were key to enabling the growth in confidence of other PwDs in learning to use eCooking and supportive appliances such as mixers in the early days of the study:

> *"My father was right there in the kitchen during the demonstrations. He was actually hovering over me, trying to instruct me! The Prabhat team had to ask him to let me learn the appliance on my own so I could get familiar with it. He was just eager to help. Later, my brother and father asked about the purpose of the project, but overall, they were just happy I would get relief from the pain of kneading dough for Roti, Bhakhri, and Paratha."* (Woman with orthopaedic disability)

Some participants reported how they felt differently about using inductions and EPCs, with some finding EPCs intimidating to use, whilst others found inductions intimidating. PhotoVoice with one woman with an orthopaedic disability illustrated how gradual learning led to confidence in eCooking (Figure 23).

Figure 23: Earlier, I could switch this (induction) on using the red button, but if I wanted to increase the setting, it was difficult, I was unable to press the button hard enough. But with practise, I can now increase and reduce it easily. Earlier, when a sound used to come from the induction, I would get scared. But then, using my own understanding, I would switch it off and on again and reduce the setting. After that, the sound also stopped coming." (Photo © Arunaben Rathod)

Initial fears were also overcome through family members using the appliances alongside them. As one woman (OD) described, the novelty of an EPC and a sense of curiosity about how she could cook with it drew her to choosing the appliance. Whilst a degree of apprehension remained at the time of the interview early in the research process, the excitement and enthusiasm of her children in using the EPC and in learning how to use the induction cooktop to make tea helped her to grow further in confidence in eCooking when she first started to use the appliances. This growth in confidence led the participant to keep notes since the first time she tried to use the EPC and induction cooktop, recording her experiences on a regular basis. She was also among the early users who

was able to figure out which settings to use efficiently to cook non-veg, even without a non-veg option on the EPC.

One woman with an orthopaedic impairment highlighted her previous experience with eCooking technologies as a rationale for her choice of appliances:

> *"I have chosen EPC and Induction for my usage. I've had previous experience with Induction. One of my roommates had bought it for their personal use during which time, we used to share it amongst ourselves."* (Woman with orthopaedic disability, workshop 2)

3.2.2 Caregivers

Participants selected eCooking appliances based on the specific dietary requirements of their household. As one caregiver described, she chose to trial a rice cooker, because:

> *"Most of the dishes we eat daily—like Khichdi, Rice, Halwa, Handva, and Pulav—are much easier to prepare in a Rice Cooker. Since it has multiple uses for our specific diet, it seemed the most practical choice"* (Caregiver)

This caregiver was not concerned with potential increases in her workload as a result of eCooking. However similarly to PwDs, a degree of fear about using a new appliance and whether they could operate it correctly remained:

> *"There was just an initial fear because we had never used these kinds of appliances before; it felt a bit overwhelming. We never imagined we would have the opportunity to use such machines in our daily lives. But honestly, acha laga (it felt nice)."* (Caregiver)

> *"I worried, "What if we break or ruin them?" However, the first workshop was very helpful. We understood the basic mechanics of the machines right then and there."* (Caregiver)

3.3 Embodied Experiences of the Transition to eCooking in Households with PwDs

The transition to eCooking was a highly embodied process for all participants. The data reflected how this journey was shaped by emotion, trial and error of various and often new dishes they had not cooked before receiving the eCooking appliances, and the physical design and accessibility of existing eCooking appliances.

3.3.1 Adoption of eCooking in Households with PwDs: A non-linear trajectory

Non-linear adoption trajectories and adaptive research engagement shaped the process. Hesitation, withdrawal, re-engagement, and accelerated uptake were observed depending on health, domestic workload, or shifting responsibilities. Flexible follow-up schedules were necessary for working women and community leaders. Tailored reassurance was required in cases where fear rather than disinterest limited

engagement, highlighting the importance of adaptive, participant-responsive research design in technology introduction studies.

Overall, the transition to eCooking was a lengthy process for all participants, with many using electric and LPG as a combination to cook. One woman with an orthopaedic disability described how whilst she was pleased to be using an induction cooktop, she did not use it to cook all of her dishes. It was noted that the induction was used simply because it was provided to her as part of the study, and integrated into her routine to make smaller meals and tea, keeping the induction cooktop next to her gas stove:

> *"For this evening, I am currently preparing a cabbage and carrot sambharo. I also plan to cook a cabbage and pea vegetable dish on the induction. However, I will make the khichdi on the gas stove tonight. Since I only need to cook a small amount (about half a cup) for myself, it is more practical for me to use a small pot (tapeli) on the gas."* (Woman with orthopaedic disability, telediary, 05/01/2026)

Gas cooking remained a part of cooking routines. Gas was still preferable for making rotis over induction cooktops, due to the ability to make them softer by 'puffing' them on open flames. One participant noted that she would only use the induction cooktop alone on the days she was not making rotis or similar dishes.

Daily cooking significantly shifted towards eCooking for other participants. One couple, who both had orthopaedic disabilities and cared for each other reflected on how they used an EPC daily to make dal, *pulao, khichdi* and a weekly chicken dish, whilst they used an induction cooktop to make chai, vegetable curries and Maggi noodles. Using an EPC meant that dishes such as dal could be cooked at 10am in the morning, and due to the heat retention features of the appliance, remained warm enough to eat at 1.30pm for lunch, replacing the need for an oven.

3.3.2 eCooking Routines of PwDs and Caregivers

eCooking became part of cooking routines for PwDs and caregivers to different degrees. All participants cooked a wide range of dishes using EPCs, rice cookers and induction cooktops. Most participants cooked for small families of **2 to 5 people**. However, some used the appliances for much larger groups. One caregiver prepared chicken dishes for **10–12 people**. A woman with an orthopaedic disability hosted a dinner for **10–11 guests**, whilst one woman who was completely visually impaired had planned to use her rice cooker to prepare vegetables for a gathering of **30–40 people**.

3.3.2.1 Dishes Cooked with eCooking Appliances

Participants used certain eCooking appliances to cook certain local dishes. Table 4 provides an overview of some of the dishes cooked and some of the cooking options used to make them, as recorded through cooking diaries, by PwDs and caregivers:

EPC	Rice cooker	Induction cooktop
● Cauliflower, pea and potato curry- 'Veg curry' option ● Chana subzi- 'Chole/chana' setting ● Aloo (potato) and soyabean subzi, 'Veg curry' option, ● Chicken Angara ● Plain Rice ● Pulao Rice ● Tuvar dal ● Moong dal ● Moong dal and vatana (dried peas)	● Rice ● Sev kheer (vermicelli and milk pudding) ● Vegetable khichdi (rice and lentil porridge) ● Vaghareli khichdi ● Vegetables ● Vegetable curry ● Dal dhokli (spiced wheat flour dough chunks in dal stew) ● Dal	● Tea (Tea button setting) ● Rotis ● Puri ● Poha bataka ● Bhajiya ● Khichdi ● Palak ni bhaji (spinach curry) ● Soji no sheero (semolina halwa) ● Sev Tamata ● Sev Dungri (sev and onion curry) ● Mixed vegetable curry (vatana, potatoes and aubergine) ● Bhindi (okra) curry ● Tuvar dal (pigeon pea lentils) ● Papdi (flat beans) ● Vatana ● Moong dal with skins- cooked directly without pre-soaking ● Mixed dal ● Chora (long beans) ● Ganthiya (gram flour noodles) curry ● Flower Bataka (cauliflower and potato curry) ● Palak Bataka (spinach and potato curry) ● Bataka nu shaak/sukhi bhaji (potato curry) ● Cabbage ● Brinjal

		• Carrot-Onion Sambhara • Dal dhokla • Farali moraiyo • Ravaiya bataka curry • Paneer curry • Maggie noodles • Capsicum and namkeen curry • Mutton and methi curry • Fried papad • Sukhdi[9] (wheat flour, ghee and jaggery biscuits) • Sweet sev (wheat vermicelli) with milk, ghee, sugar, cardamom and almonds • Sev kheer

Table 4: Dishes cooked across eCooking appliances by PwDs and caregivers

Nearly all participants reported that the food tasted *"exactly the same"* or even *"better".* One participant noted the Dal came out *"chutti-chutti"* (perfectly separated) and delicious. Another said the taste was *"wonderful"* and that the induction allowed flavours to mix well through slow simmering. Some felt the food was *"mast"* (excellent) and that the consistent heat prevented the "burnt" taste often caused by gas stoves. Yet, as Figure 24 reveals, PhotoVoice identified that mastery of the appliances to make even the simplest of foods, such as plain rice, was not always smooth.

[9] Made specifically as a religious offering

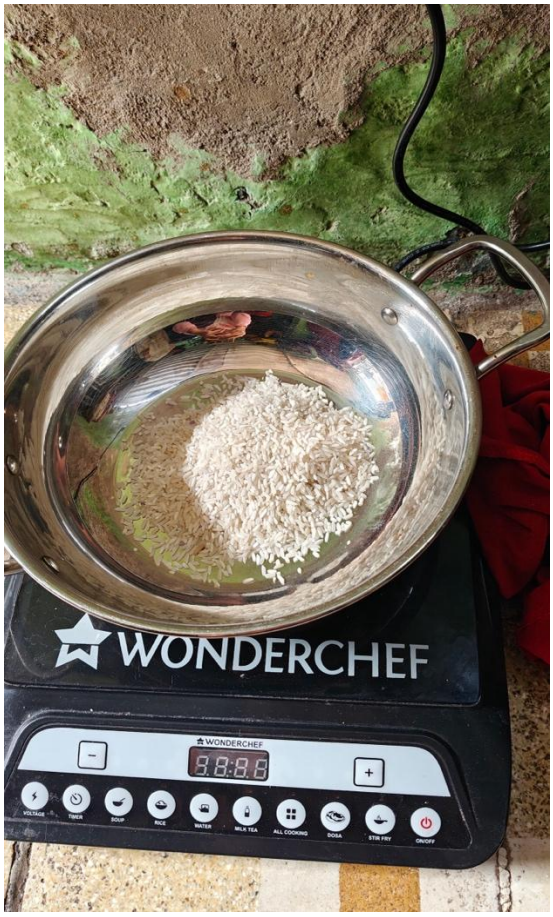

Figure 24:: "We have tried cooking Rice on Induction but it always sticks on the bottom for some reason no matter the quantity of rice or water. It's such an easy recipe but we struggle with it." (Photo © Soni Chandrika)

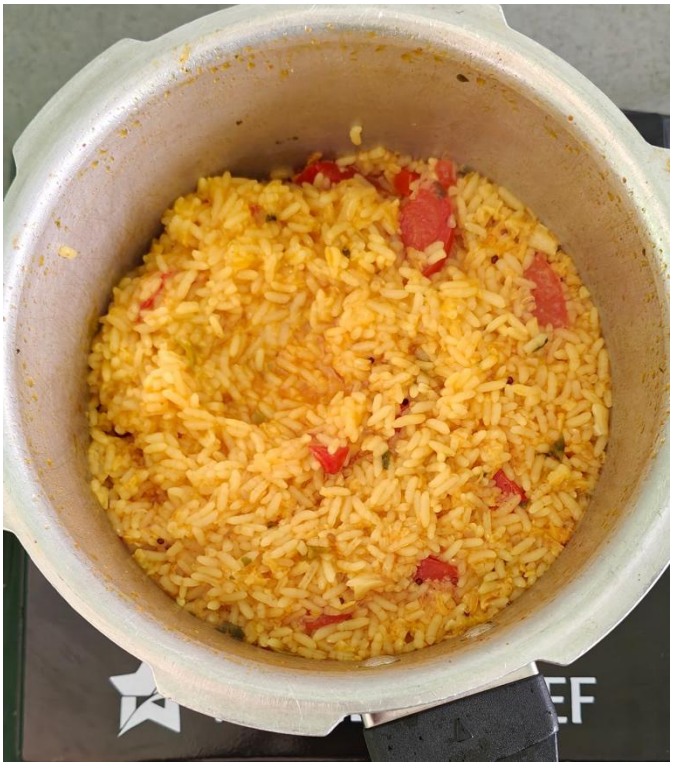

Figure 2511: "The food that does get cooked fine on Induction tastes so much better than the LPG gas cooking. It retains all the flavours and just enhances the overall taste. Be it my Chai or Khichdi." (Photo © Saraswatiben Marwadi)

3.3.2.2 eCooking: Time Saving with Multi-dimensional Redistribution in Households with PwDs

Participants consistently reported saving between 30–45 minutes daily because of cooking with electricity. However, time savings did not translate uniformly; rather, they were redistributed according to household priorities and socioeconomic positioning. For some, saved time translated into increased economic productivity (e.g., reaching factory work earlier, extending shop hours, or producing marketable goods such as doormats). In such cases, the appliance indirectly contributed to household income stabilization. For others, saved time enabled restorative rest—particularly among participants experiencing chronic back pain, joint stiffness during winter, or general fatigue. The ability to sit while cooking or rely on the timer reduced the need for constant standing and monitoring. In caregiving households, saved time facilitated closer supervision of vulnerable family members, including enabling PwDs to spend more time caring for children or grandchildren. Thus, time efficiency functioned as an enabling resource that could be converted into income generation, care work, or self-care depending on context.

Cooking diaries revealed how using EPCs, induction cooktops and rice cookers enabled dishes to be cooked with much greater speed:

"This morning, I prepared Batata Poha using the induction cooktop, and it was ready in only 10 minutes. Compared to using a gas stove, my poha turned out very well and was perfectly fluffy. Because I move around while seated, it takes me some time to gather all the items I need; however, the induction allows me to keep the temperature low so my food does not burn and is cooked properly. In the evening, I used the Electric Pressure Cooker (EPC) to boil rice and prepare Tuvar dal, both of which were also completed within 10 minutes." (Woman with orthopaedic disability, video diary, 7/1/2026)

"In the morning, I made tea for everyone on the induction and in the EPC for lunch I made moong dal ke Badiye and dried peas/vatana for which I chose the dal option on the EPC (I soaked the badiya beforehand in warm water with salt, so it cooked perfectly, only the dried peas/vatana took time). The cooking process was just 4-5 mins (1 whistle) after the sautéing process. In the evening for dinner, I made tuvar dal (selecting the dal option), boiled rice in the EPC and fried pickled chilli in the kadhai on the induction. My cooking experience today was good. I pre-soaked the rice and dal for half an hour before cooking and the dal was cooked beautifully, very soft. I also cooked the rice in the EPC. I feel the food gets cooked well and there is no variation in taste. The rice took 10 minutes to cook and dal 7-8 minutes, I don't know if it gets cooked because I pre-soak or because of the appliances am not sure, but I strongly feel they cook faster than the gas." (Woman with orthopaedic disability, audio diary, 5/1/2026)

"I also used the induction to make tea about a couple of times during the day, which is very quick to prepare." (Woman with orthopaedic disability, telediary, 6/1/2026)

Dishes such as pulao, rice and chicken curries (made in as little as 20 minutes) were quicker to cook using the EPC and lessened the need for monitoring a gas dial and reduced worries about food getting burned. PwDs found it beneficial to be able to cook food in an EPC and to leave it on 'warm' settings, to avoid the need for reheating and to use their time for other activities. One woman who was visually impaired noted that a combination of cooler weather and the time freed up by eCooking led her to make tea twice a morning, instead of once a morning, using the 'tea/milk' setting, a low-heat function to avoid burning on the induction cooktop in a morning. Induction cooktops were widely regarded by people with disabilities as being able to cook more quickly than gas stoves. PhotoVoice (Figure 26 and Figure 27) revealed how women with disabilities saw benefits in the time freed up by eCooking for their overall cooking and wider domestic chore routines, as well as for supporting family members experiencing ill-health.

Figure 26: "I really like making tea on this. If the tea is less, I keep it on low, and if there is more tea, I increase the induction. Compared to gas, this feels much easier. The tea boils quickly on this. It doesn't take much time." (Photo © Arunaben Rathod)

Figure 27: "The induction takes care of the cooking part on its own. It doesn't need monitoring which helps me finish other chores of the house. I have taken care of the chores as my Mom's health is fragile currently." (Photo © Soni Chandrika)

Women comprised most of the sample of PwDs and caregivers. eCooking appliances were key to supporting women who were caring for children with intellectual disabilities. One caregiver of two children with intellectual disabilities described how the induction cooktop was a critical time saving measure as part of her daily routine:

> *"In addition to the curry, I used the induction for my daily routine, which includes heating milk and frying papads; both of these tasks typically take about 10 minutes each. …I truly enjoy working on the induction. The food tastes excellent because the slow flame setting prevents it from burning, and it also allows me the flexibility to attend to other chores while the meal is cooking. I find both the machine and the cooking process to be very efficient."* (Caregiver, audio diary, 11/01/2026)

During the second workshop, this caregiver noted how at the time she noticed it had begun to save a lot of time early in the process, even though she had not used the induction as extensively. The caregiver also reflected how time was saved because eCooking appliances were easier to clean. eCooking was also demonstrably a route to including her daughter in cooking due to increased safety.

One caregiver described how she managed to use an induction cooktop to make a potato, onion and tomato curry in just 15 minutes. Another caregiver also noted how she was surprised at the speed of an induction cooktop:

> *"On the Induction, the oil heated so fast that the Pooris were frying almost too quickly! We had to lower the temperature to 1000. They tasted exactly the same as traditional cooking. I also made the stuffing for Chinese Samosas on the Induction at that same temperature, and it turned out perfectly."* (Caregiver, interview)

Whilst rice cookers only had a single button to operate them, caregivers preferred inductions because of the speed at which they felt able to cook:

> *"I prefer the Induction cooktop. Even though the Rice Cooker only has one button and the Induction has many, the Induction is so fast. Chai is ready much quicker. The fact that the Induction manages the temperature automatically makes it easier for me."* (Caregiver, interview)

A caregiver to a child with an intellectual disability reflected on how she felt that an induction was quicker than an LPG stove, and how a rice cooker took less time to cook meals and that it was easier to wash.

The time saved by eCooking was also noted by a man who had an orthopaedic disability and cared for his wife, who was also disabled. He reflected on how eCooking appliances seemed to be a 'perfect solution' for people who dislike the time-consuming nature of traditional cooking. The couple worked for long shifts. He shared a recent example where they returned from work at 9:30 PM, started cooking at 10:00 PM, and were finished by 10:30 PM. It was noted that certain tasks that once took 30 minutes now took 15 minutes, due to the couple being able to use an EPC and an induction cooktop.

3.3.3 Design and Accessibility of Existing eCooking Appliances

Existing eCooking appliance design for EPCs, induction cooktops and rice cookers presented both opportunities and challenges for PwDs and caregivers as they used them to cook daily dishes.

3.3.3.1 Accessibility across all eCooking appliances

A prominent impact of using eCooking appliances for participants was the reduction of physical strain, as they altered the embodied experience of cooking. eCooking technologies reduced the need to stand continuously, provided lower vessel heat exposure, and eliminated the need for heavy vessel transfer. 'One pot cooking' features, particularly for EPCs and rice cookers, were observed to reduce repetitive handling. These shifts were especially significant for participants with musculoskeletal pain, winter-related stiffness, or limited mobility. For some, cooking transitioned from being described as a "strain" or "chore" to something manageable and occasionally enjoyable.

In the case of a fully blind participant, early mastery of the induction (including independently making tea on distribution day) disrupted assumptions about capability. It was found that the additional 'hands on' training provided by the team and requests to neighbours to provide supervision to ensure this blind participant's safety was not needed, as she would independently contact the research team when required, giving her a source of reassurance. Visually impaired participants across the sample benefitted from additional handholding from the research team during the testing phase to familiarise themselves with interface challenges, after which they had memorised the functions and options they were most comfortable with, For one visually impaired woman, braille stickers were removed by her son, who mixed them up, leading her to rely on her memory instead. Persistence in navigating tactile interfaces was observed across several participants, highlighting that interface challenges did not necessarily preclude adoption when motivation was high.

PwDs and caregivers valued the fact that all of the eCooking appliances were portable and could be used anywhere where a socket was available, and that they were lightweight enough to be able to move them around anywhere where they wanted to use them. As one woman with an orthopaedic disability noted, the ability to move an induction cooktop around meant that she was able to bring the cooktop to her bedside and make herself a cup of tea, even when she was unwell, lessening the burden of care for her family where she was able to.

A woman with an orthopaedic disability also emphasised the importance of the portability of an induction cooktop and supportive appliances such as food processors during periods of ill health:

> *"I was sick for a few days so the advantage for me here was to be able to keep it by my bedside table and use it whenever required. The portability really came in handy. So far, I have used food processor to knead the dough, chop vegetables and make Juice. Because I live in a joint family which has kids and elders both living, the usage of these appliances and being able to do multiple things at once saves a lot of time and energy. Even on Induction, I've made Chai and boiled eggs so far. I'm keen to use it extensively once I've recovered a little."* (Woman with orthopaedic disability)

The portability and spatial flexibility of eCooking appliances expanded their function beyond fixed kitchen infrastructure. Participants moved induction units to different rooms, used them while seated, carried them to relatives' homes during large functions, and even integrated them into small food-vending enterprises.

Caregivers also described how the ability to move eCooking appliances around the house also enabled them to better ensure the safety of their children with intellectual disabilities, particularly because they found the appliances to be lightweight and did not involve any use of open flames.

Heeraben's transition from the High Risk of LPG to the Control of eCooking

Heeraben's world is defined by sound, scent, and the topographical map she carries in her fingertips. When the tactile "click" of a gas knob was replaced by a silent, perfectly flat glass surface, a fundamental sensory link was broken. Her transition to e-cooking is a quiet exploration of human adaptability. It documents the painstaking process of memorizing the hum of a fan and the precise location of a button that offers no physical feedback. It is a story that challenges our assumptions about "intuitive" design. [Watch: How Heeraben "feels" the heat on a silent glass plate]

Participants noted a need for audio cues across all eCooking appliances. A lack of audible alerts for all of the eCooking appliances tested was found to be a challenge for those who are visually impaired, which was also an observation made for people with visual impairments by participants with orthopaedic impairments. One couple with orthopaedic disabilities stated that whilst they find the buttons easy to understand because they can read the labels, they suggested that for users with visual impairments, the appliances should feature buzzers or audio descriptions to help identify functions.

Informal discussions held with the PwDs and caregivers at the co-design and creative workshop identified the need for eCooking appliances to have tactile markers. Participants with visual impairments, who rely on touch to navigate, need raised markers or textured stickers on critical buttons — start, stop, pressure level, timer, temperature. Without tactile cues, every use becomes guesswork, especially on smooth digital surfaces.

The data also reflected how the visual interface of eCooking appliances could be challenging. Some visually impaired users struggled to read the temperature settings or distinguish between small buttons. One user noted the need for voice prompts or Braille labels.

A need for non-slip bases for eCooking appliances was also raised. Several households had uneven surfaces or crowded counters. Appliances needed to be steady even if placed on top of cloths or wooden boards, common workarounds in low-income homes.

People with orthopaedic disabilities commonly had 'sitting kitchens', as identified in Phase I (Silakari et al, 2025). Women who needed to sit down to cook found advantages in the height of eCooking appliances:

> *"What I really like about the induction and the EPC is that both are not very high, even though I have kept the gas stove on the floor, but when I keep a big vessel on it, due to my condition it becomes very difficult to look inside the vessel and stir. I used to find it very difficult if I would keep a big cooker on the gas stove, I wouldn't be able to look inside at all, I would then use a stool to sit and see while I cook, but that used to hurt my back a lot. But with the induction and the EPC I have that convenience. I cook only that much that can be prepared on the induction or the EPC aaram se, about 1-1/2 kilos."* (Woman with orthopaedic disability, audio diary, 6/1/2026)

Timers were advantageous for PwDs and caregivers. Across the sample and for EPCs and induction cooktops, timers were particularly useful for women who needed to multitask to do other chores around the house:

> *"The timer is also a very helpful feature, as we can just set the time and it automatically gets switched off once done. [...] What I appreciate about using the induction is that it is very fast, and I can easily look into the vessels while I work. I also find it very helpful that I can set a timer, which allows me to get on with other tasks comfortably while the food is cooking."* (Woman with orthopaedic disability, audio diary, 8/1/2026)

A caregiver of two children with intellectual disabilities described how the "Timer" function on the induction allows her to de-couple her physical presence from the stove. She can "set and forget," moving through the house to mop or clean without the psychological burden of a burning flame. The timer allows her to multitask without the "fire anxiety" of LPG. Even when human error occurs: such as a rice dish sticking to the bottom because she was preoccupied and forgot the timer—the technology offered a hidden benefit: the specialized utensils were significantly easier to rinse and clean than traditional pots, saving her further labour.

Education and the ability to cognitively understand the features of eCooking appliances was noted by one woman with an orthopaedic disability as being an important factor to consider. She reflected on how she felt that her education does make a difference, and

people who can't read or understand for any reason may struggle with the buttons and not be able to tell what each does. This woman suggested that integrating some form of a universal button or setting into eCooking appliances would be beneficial for people with cognitive challenges.

Simplified toggle buttons were raised by many participants as an important feature to incorporate in eCooking appliances. Discussions during the workshops identified that many participants preferred appliances that follow a predictable sequence: on → select mode → start, especially those with cognitive or limited literacy challenges.

One caregiver noted how she felt that the eCooking appliances were well-designed. It was noted by this caregiver that she did not see a need for modifications in eCooking appliances, because

> *"...They are simple enough as they are. They are lightweight, so moving them isn't an issue. I keep them near the plug point, and if I need to use the LPG stove, I just slide the electric appliances aside. Everything is very easy."* (Caregiver, interview)

A woman with an orthopaedic disability felt that despite having concerns and occasional worries regarding cooking outcome, she was ultimately comfortable with both the induction and EPC. This woman considered both appliances easy to use and personally could not think of ways to make them simpler or any other modifications she might want.

3.3.3.2 EPC

EPCs were found to have features which supported people with disabilities and caregivers to cook. The data reflected benefits for PwDs during the winter season, the time at which this research was conducted, due to it being a 'one pot' cooking system. Cooking diaries revealed that the functionality of EPCs had benefits for PwDs' health:

> *"The EPC is really helping me during this winter season, as my hands feel too weak and I don't have much strength to lift heavy vessels."* (Woman with orthopaedic disability, video diary, 5/1/2026)

Video diaries revealed how this woman was using a gas stove less and the EPC more during the cold weather. The EPC had accessibility advantages for this participant because she could sit down and cook her meals, making the process easier for her overall. Her video diary demonstrated her experiences of making pulav (rice-based dish) in the EPC, and that whilst she found it difficult to use standard tongs or grips, she saw advantages in not needing to monitor a gas dial or worry about the food burning as it was being cooked. A video excerpt demonstrated in depth how because her hands are weak, it usually makes it difficult for her to hold hot items. It was revealed how this participant was able to lift the inner vessel of the EPC out with ease without using a cloth, which was particularly beneficial for her because she had a hand condition. The lack of heat from the EPC eliminated the danger of dropping a hot vessel and suffering burns, which is a risk when using a gas stove where the entire pot becomes hot.

Cooking diaries also illustrated the benefit of the timer function in EPCs and the speed at which food was cooked:

> *"I made chicken in the EPC, I had set the timer for 35 minutes, but opened and checked when there was 14 minutes left and to my surprise the chicken was cooked, so that means it took only 19 minutes to cook the chicken, isn't it magical! I feel the food gets cooked magically so fast and cleaning post cooking is also so hassle free and easy. While I made chicken in the EPC I made rice on the induction in the cooker."*
> (Woman with orthopaedic disability, audio diary, 13/01/2026)

A degree of apprehension remained among the sample when using the EPC. One woman with an orthopaedic impairment noted early in the testing phase how she was cautious about using it due to the number of buttons, and had a background level of anxiety for recipes going wrong.

Discussions during the co-design and creative workshop raised challenges with EPC handles and lids. Several participants mentioned wrist pain or limited finger mobility, making it difficult to handle heavy or slippery lids. It was noted by workshop participants that future versions of the EPC could include silicone grips, lighter lid mechanisms, or latch systems requiring minimal force.

A need for audio alerts or whistles to be integrated into EPCs was raised:

> *"I typically cook for five people, and since there isn't a specific "chicken" setting, I always use the "Rajma" (kidney bean) feature to get the job done. Regarding potential improvements, I think it should include a whistle or alert to signal exactly when the food is ready, especially for visually impaired people. Taste is the same. I don't find anything difficult in this, rather it makes my cooking process easy."*
> (Woman with orthopaedic disability, audio diary, 11/01/2026)

Interviews revealed that some residual confusion remained regarding appropriate water requirements when using the EPC, and that the whistle required some gentle nudges to work well. This was seen to be due to ingrained gas stove cooking habits and not remembering to adjust water requirements to EPC needs. One participant with an orthopaedic disability reflected on how she had stuck to using the EPC for simpler dishes as a result, out of concern for food or liquids boiling over and spilling out due to mistakes. At the time of this interview, early in the process, she noted how she was willing to try more dishes such as cakes and *khaman* once more habituated to the EPC's whistle and water-based nuances.

One couple raised the fact that cleaning is also straightforward for them, by just using water and soap, making it "hassle free". Another participant also used soap for the container and cleaned the EPC coil only with a dry cloth, making sure it was turned off before she did any cleaning.

A caregiver of a child with an intellectual and visual disability noted how there was scope for improvement in the interface of the EPC. She found the induction interface to be more accessible than the EPC because of the layout of the buttons, reflecting scope making the EPC more navigable for people with disabilities.

3.3.3.3 Rice cooker

PwDs saw benefits in the existing design of the rice cooker. As the cooking diary of one woman with an orthopaedic disability noted,

> *"My cooking has become quite varied…Last night, I made a vegetable khichdi in the rice cooker for four people using two bowls of rice and four glasses of water. I let the peas and potatoes cook for half an hour first to ensure they weren't raw .....I love that the rice cooker switches off automatically, preventing the food from sticking and ensuring a delicious taste."* (Video diary, woman with orthopaedic disability, 7/1/2026)

Telediaries also reflected how being able to keep the rice cooker in a 'slow cook' mode was useful for people with visual impairments:

> *"It took about 30 to 45 minutes because the oil and mustard seeds take time to heat up, and I let it cook slowly. I followed your advice and kept the switch on the "Warm" setting instead of turning it off at the board. This allowed the dal to finish cooking perfectly, similar to the story of Birbal's khichdi."* (Telediary, woman with visual impairment, 9/1/2026)

For this woman, not being able to see at all brought challenges in monitoring cooking throughout the process in general. Her telediary illustrated the benefits of a deep pot in a rice cooker in preventing food from boiling over in this context:

> *"To finish my meal, I prepared Dal Dhokli using the Rice Cooker. I find the rice cooker very useful for this because its shape is like a deep pot, which prevents the dal from boiling over. As the dal simmered, I rolled out rotis, cut them into pieces, and added them to the pot bit by bit while stirring. The entire process took about 45 minutes, with the dhokli pieces taking between 15 and 25 minutes to cook through. I prepared enough for one person for one meal. Regarding the taste, I found it to be good; while some say the cooking method changes the flavour, I believe the "sweetness" or deliciousness mostly depends on the salt and spices you add."* (Telediary, woman with visual impairment, 6/1/2026)

However, this woman also faced challenges with the inefficiency of the rice cooker at times:

> *"I faced no difficulty or challenge using the appliances today. I can manage the buttons and settings myself. But the rice cooker proved inefficient today for the*

vegetables that I was cooking because it took more than 35 minutes for it to soften." (Telediary, woman with visual impairment, 5/1/2026)

Other participants with visual impairments saw benefits in the lights and audible sounds of the rice cooker. Describing how she was using the rice cooker, another woman who was visually impaired said that a red light came on to signal that the cooker had started. This was followed up by an audible 'click' from the switch, which makes a sound as it moves. These audible and visual features were critical to the navigability of rice cookers as part of the daily routines of those who could not see, and were in effect, almost or completely cooking 'in the dark'. One woman who was completely blind noted the lack of settings in the rice cooker was a challenge, comparing it with the features of the induction cooktop. When asked how she checks if food is cooked during a telediary conversation, she replied:

"I check it with a spoon. I find that the rice cooker is quite slow and I wish it had different points or settings for different dishes, similar to the twelve buttons on the induction cooktop." (Telediary, woman with visual impairment, 7/1/2026)

The reflection on the need for multiple functions suggests that whilst not tested as part of this study, a multicooker, a type of eCooking appliance which provides multiple cooking options, may have been an option that could have been tested as part of this study. A visually impaired woman described in the co-design and creative workshop how the support of her daughter was essential in navigating the functions of the rice cooker. At the time, she was not using the rice cooker as often as she would have liked to, because the process of plugging it in was challenging. Family dynamics were critical in navigating existing design, as her daughter was in the process of teaching her how to plug the rice cooker in.

Participants also had concerns around ensuring the safety of others, in particular children, when the rice cooker was being used. The daughter of a person who was visually impaired, who was critical in enabling them to cook, described how although the rice cooker had a 'keep warm' feature, she preferred,

"... to turn it off at the main switch because my sister's son [...] runs around the kitchen and I don't want him touching anything." (Caregiver of VI woman, telediary, 9/1/2026)

Overall, rice cookers were beneficial particularly for visually impaired participants due to their 'slow cook' features and being able to 'set and forget'. The data demonstrates however that safety and the ability to control the appliance with physical buttons remained important for participants.

3.3.3.4 Induction cooktop

Induction cooktops were tested by all households with PwDs in the study. PhotoVoice (Figure 28) identified that even before people with orthopaedic disabilities were able to cook with the induction cooktop, plugging it in and unplugging it from the socket was a challenge. This reflects that the inclusion of PwDs in eCooking requires consideration of the design of the electrical infrastructure needed to operate them, from the shape of the plug to the placement of sockets at a household level, before cooking can even begin.

Figure 28: "I can't plug it in myself, so I have to ask someone to do that. After that, I can switch it on and off. I also can't unplug it on my own. Switching it on and off does not cause any difficulty." (Photo: Arunaben Rathod)

Cooking diaries and PhotoVoice revealed how participants tended to use certain features of the induction more than others. A woman who cared for her visually impaired mother, for instance, described how in one day, she had,

> *"...used the on/off button, the increase/decrease buttons, and button number four. Today I cooked for five people. I didn't make tea this morning, though I do usually make it on the induction. There is a specific tea button I use, as well as buttons four and five."* (Daughter of visually impaired woman, telediary, 9/1/2026))

Figure 29: "I make tea on the induction. I have now learned at what temperature to make tea. With this, the tea gets ready quickly. I like the specific setting for tea and other things." (Photo © Geeta Makwana)

The existing design of the induction cooktop was particularly a challenge for people who were visually impaired. Diaries and PhotoVoice data (Figure 30Figure) show there was a need to integrate talking features and braille markers (temporarily added by the team through stickers) to induction cooktops because the existing 'beep' sounds it makes, are all similar or the same and makes it confusing,:

> *"Because I already use a talking watch and talkback software on my mobile phone, I believe that an induction cooktop with voice prompts or talking features would be much more helpful and safer for blind users."* (Woman with visual impairment, telediary, 7/1/2026)

Figure 30: "At present, I am unable to tell the exact temperature I am cooking at, as the beep sound for both high and low settings is the same. Since different foods require different temperatures, this becomes challenging for me. Some form of audio assistance would be very helpful for visually impaired people like me. Additionally, braille markings on the buttons would make a big difference; at the moment, I rely entirely on memory." (Photo © Saraswatiben Marwadi)

Figure 3112: "The challenge with Induction is that due to my vision impairment, I can never tell what temperature am I cooking at or if there's any kind of spillage happening while the cooking takes place. So, there's a fear of short circuit due to spillage or food being overcooked or undercooked due to the temperature mess up." (Photo © Saraswatiben Marwadi)

The telediary of a woman who was visually impaired revealed the importance of the induction cooktop in facilitating her independence, particularly because it vibrates and the noise that it makes gives her an indication of how warm the vessel on the stove had

become. Vibrations from the induction cooktop were generally beneficial in enabling participants who were visually impaired to know that it was on after they had placed a pan on top. However, visually impaired participants highlighted through cooking diaries and PhotoVoice that having the temperature 'spoken' back to them would be an advantage. PwDs highlighted the importance of cookers with multiple plates to be able to cook for larger families, as a limitation of the single plate cooktop they received.

Some participants became accustomed to certain features of the induction cooktop and showed preferences due to the benefits they brought, from 'All Cooking', to specific settings for certain dishes:

> *"For Chai, I start with the "Normal" function. Once the water boils, I switch to the specific "Chai" function. I noticed when the machine senses the tea is properly boiled, the temperature automatically drops and the machine shuts off. I made sure to tell my mother-in-law about this "auto-off" feature to ease her fears. I mentioned it in the other workshop as well when someone pointed out a glitch they were facing with the temperature setup of the induction."* (Caregiver, interview)

> *"I have used three functions so far. The Hot water one, The Chai one and the mixed (general) one. But I am aware of what each of the buttons is used for."* (Woman with orthopaedic impairment, interview)

Another woman with an orthopaedic leg impairment described in a workshop how choosing the correct functions on the induction cooktop remained a process that was learned over time, and said:

> *"The thing about Induction is you have to choose the right function through the button otherwise it'll affect the timing of the cooking and method of the cooking as well. So, for sabzis, I choose the option of fry for it to work efficiently. If I choose any other option for cooking sabzis, it tends to burn a little. Same happens with Milk. Once, I choose the option of milk then it works and boils properly."* (Woman with orthopaedic disability, workshop 2)

Participants who were orthopaedically impaired highlighted the fact that cleaning an induction plate was simple for them, and they could just use a soft cloth to do so.

3.4 Psychosocial Experiences of eCooking for PwDs and Caregivers

PwDs' and caregivers' experiences of the transition to eCooking transcended far beyond the physical accessibility of the appliances. For many, the journey was not only one of navigating switches and buttons, but of a gradual, often non-linear, and varied reconfiguration of the activities of the kitchen. The data gathered showed that eCooking had significant psychosocial impacts on PwDs and caregivers. The eCooking transitions of the households who participated in this study however not only had psychosocial impacts *on* them as individuals, but were fundamentally impacted *by* their own approaches, at times with caution, in other times with confidence, towards the

technologies that had entered their homes, painting a complex and varied picture of eCooking and disability across Ahmedabad.

3.4.1 Reclaiming Agency: A Path to Independence through eCooking

A significant impact was a sense of independence, confidence, empowerment and enjoyment as the study progressed for some participants, though this was neither uniform nor universal, nor even immediate (see Section 3.4.3). At the inception of the study, it was evident that trust was a critical catalyst for self-confidence, for both PwDs and caregivers. Providing participants with high-value electronic devices served as an indirect validation of their potential. This gesture of trust by the project team was instrumental in shifting participant mindsets to a certain extent, effectively translating external validation into internal self-confidence and a sense of agency.

Cooking diaries revealed several stories around the confidence that participants gained through eCooking:

> *"Today, I prepared Dungli Bataka nu Shaak, and it was ready exactly by 11:00 AM. Despite my disability, I find so much joy in cooking now because I can sit and work comfortably without the constant anxiety of an accident. Since I first received this induction cooktop, I have used it consistently for my morning and evening meals. On mornings when I am not in a great hurry, I even use it to make my tea. If I am running late, I multitask by making tea on the induction while simultaneously preparing rotli on the gas stove."* (Woman with orthopaedic disability, audio diary, 8/1/2026)

> *"…I am not afraid of it at all anymore. It is very good to cook on. One thing I've noticed is that I can use less oil because the oil is more visible when cooking on this surface."* (Woman with orthopaedic disability, telediary, 8/1/2026)

> *"Today I felt very happy cooking on the induction as I realized that we would have never been able to bring these appliances ourselves. I cooked cabbage and potato sabzi, it was ready in approximately 20 minutes. I cooked for 4 people today. Initially I used to get scared using the appliance, but with hand-holding support, I now use it regularly without any fear. It is very convenient for me as I sit down and cook due to my disability. I urge everyone to cook regularly on the appliances provided and you will see it is more convenient to cook on it than the gas stove."* (Woman with orthopaedic disability, audio diary, 7/1/2026)

One caregiver described through her diary how for her daughter, being able to use an induction and rice cooker is a matter of great joy. Despite living with a disability, she had overcome the fear of being burnt that she previously associated with using a gas stove. This caregiver noted how her daughter had gained enough confidence in her cooking skills that she invited her mother to stand by her side while she demonstrated how she prepares the food. This shift highlights a significant increase in independence and safety,

as the technology allows for precise control such as lowering temperatures to prevent sticking which was difficult to manage on traditional stoves.

Encouragement was key. The team relayed their own morale boost and encouragement on seeing a woman with an orthopaedic impairment and other's successes with the machines and asked her how she would encourage someone new to them to learn or try using either induction or EPC. She encouraged others to try using the appliances despite initial fear or doubt, drawing from her own experience of gradually overcoming hesitation. She emphasised that with continued effort and willingness to learn, anyone can get comfortable using them. For her, it was curiosity and the decision to face her fears that helped her move beyond the comfort of the gas stove.

On the ground, some participants, including those who were hearing impaired, needed additional handholding from the research team when the study began. Gaining familiarity with eCooking appliances and being able to grow in confidence was a huge learning curve for some PwDs over the course of the study. One deaf and mute woman was initially very resistant to the idea of eCooking. This resistance was grounded in two core factors: a strong attachment to traditional cooking methods, and a fear of electrical short circuit due to wet hands. Over time, tailored reassurance and demonstration were key to addressing her safety anxiety, to reach a point where roughly 70% of her cooking was done on the induction cooktop, challenging familial assumptions about capacity.

Over time, inexperience shifted towards resourcefulness, as PwDs turned to social media to learn how to use eCooking appliances:

> *"I absolutely love cooking but there is a lot of fear inside me. I was thinking of watching videos on YouTube by myself before I use the appliance. I realised that these appliances demand a little time in learning and I already am efficient and familiar with LPG cooking. So, I prefer cooking through that. Mainly, because I don't have experience in using eCooking appliances."* (Deaf and mute woman, co-design and creative workshop)

Amid these differences, one theme was constant: participants were eager to learn and grow, even if initial confidence was low. As one visually impaired woman powerfully said, *"If we don't use the appliances out of fear, there is no point of being part of this study."*

A sense of safety as both physical and psychological assurance emerged as a central theme, particularly in small dwellings and in households with children or members with disabilities. The absence of open flame reduced anxiety around gas leaks and fire hazards. For caregivers, the perception of reduced fire risk made it possible to gradually introduce children—including those with disabilities—to basic cooking tasks. For visually impaired participants, safety was initially mediated by fear—particularly around electricity and wet hands. Targeted demonstrations and repeated reassurance were essential in mitigating these concerns. Confidence grew only when fear was addressed early. As was the case with many participants, the eCooking journey of a fully visually impaired woman

began with a moment of panic, in mistaking a pre-heat cycle for burning, which was quickly resolved through support from the Prabhat team. With just one assurance, she gained confidence and began independently making chai, sabzi, sukhdi, and kheer, after which she said:

> *"I feel extremely confident about my abilities and I know I will be able to use it more efficiently the more I spend time with it. Even though I am completely visually impaired, I know I will learn these appliances soon and prepare my food with the help of it. I will overcome the challenges that come my way."* (Woman with visual impairment, interview)

Once trust was established, several participants transitioned from hesitant to independent users. It was observed by the research team that one orthopaedically impaired woman's experience of overcoming hesitation can encourage others who lack the confidence to use such technology, proving that these tools can bring both happiness and ease to a household.

eCooking technologies became a catalyst for reclaiming agency. Most poignantly, agency came through **functional demand rather than curiosity.** For one woman with an orthopaedic disability, a reconfiguration of the physical infrastructure of the home and a sudden change in household dynamics through family illness brought her back to the hearth and triggered necessity-driven eCooking adoption, coming out of culinary retirement with an induction cooktop to support her family:

> *"The most significant benefit for me is that I can cook while seated. Because of my health, I do not have much strength to stand, so being able to sit down and prepare tea or meals by myself is a huge relief. Previously, if my sister-in-law was not around, I would have to rely on my neighbours, but now I no longer have to worry or depend on others. It has given me a sense of independence, and my only remaining goal is to eventually be able to make rotis while seated as well."* (Woman with orthopaedic disability, telediary, 6/1/2026)

Bhikhiben's Culinary Reclamation Through eCooking

After five years of forced retirement from her own kitchen, 56-year-old Bhikhiben is learning to cook again. For half a decade, she was relegated to the margins — chopping and peeling while others performed the final act of cooking at a stove she could not physically reach. Her return to the hearth was not an easy one; it required a radical remapping of her environment, bringing plugs and pots down to her level, and a dogged internal dialogue to overcome a deep-seated fear of "invisible" heat. The turning point came during a family illness, when the woman who once waited for others to feed her became the provider, serving *Khichdi* to those who had long cared for her. Bhikhiben's "baby-stage independence" is a poignant testament to reclaiming one's agency at the centre of the home. [Watch: Bhikhiben's Return to Kitchen)

The findings from the cooking diaries and interviews echoed the narratives gathered through informal discussions through the survey. The survey demonstrated how for many participants, particularly those with orthopaedic and visual disabilities, the eCooking appliances were not just conveniences but tools of empowerment. The most significant and universally cited benefit was the **removal of fear associated with open flames and LPG gas**, which directly translated into a greater sense of safety and, consequently, independence. Figure 32 illustrates the pathway to independence which was identified through the survey narratives, which, like the overall process, was non-linear, and varied from person to person, despite the overall trajectory towards reclaiming agency.

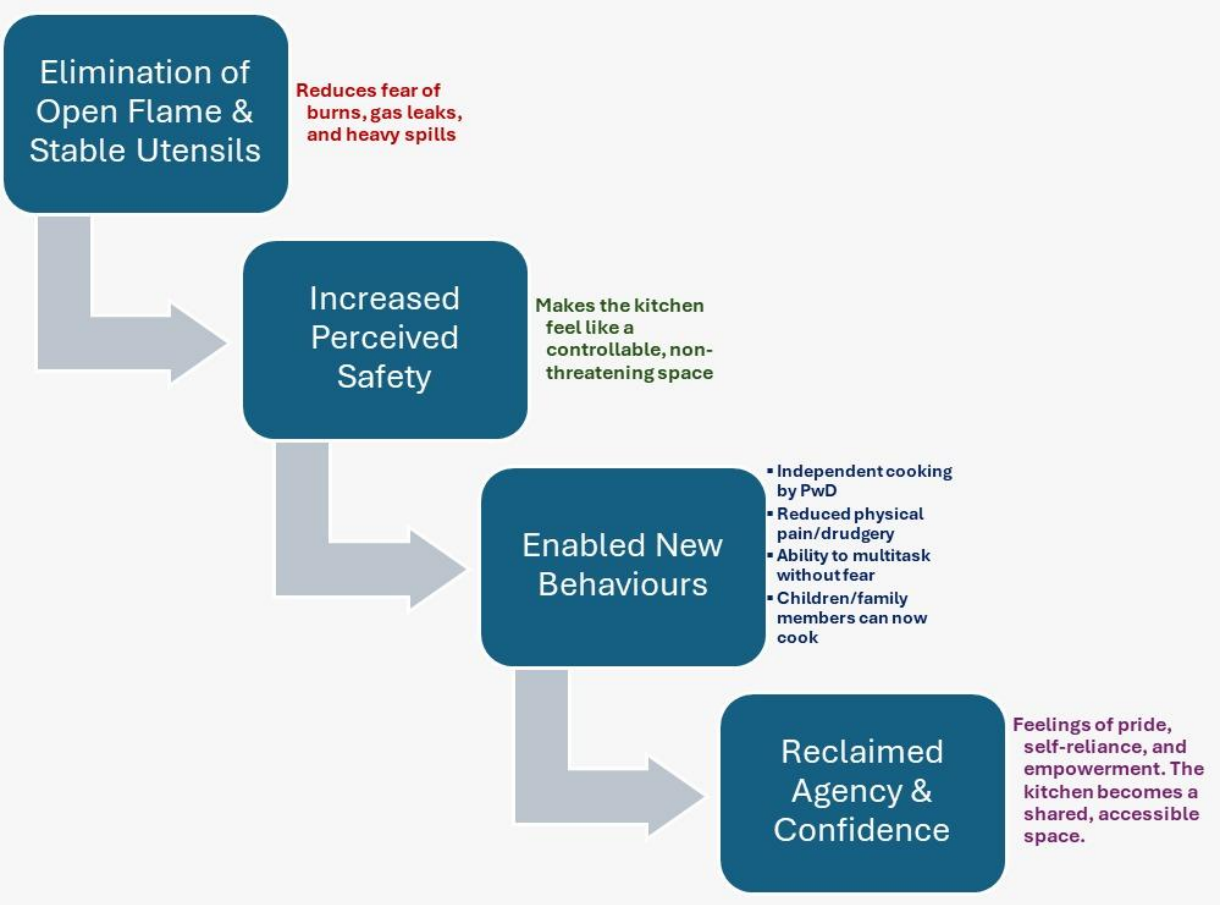

Figure 32: The Pathway to Independence Through eCooking

Safety was a prerequisite for independence through eCooking, as identified through the survey. The fear of gas leaks, burns from "red hot" utensils, or a heavy pressure cooker falling was a recurring theme in the first survey. The second survey confirmed that these fears were effectively mitigated by the induction cooktop, initiating the pathway illustrated in Figure 32.

One woman articulated this powerfully, stating,

> *"On LPG, I feared the pressure cooker might fall off the stove and land on my arms... The induction is far more comfortable and stable... These 'minute facilitations'—like the edges of the utensils staying cool enough to touch without tongs—make my daily life much safer."* (Woman with orthopaedic disability, survey).

Her ability to handle pots without assistive tools was a tangible gain in physical independence.

For caregivers, this safety translated into profound psychological relief. As one caregiver noted through the survey,

> *"I am much less worried about [daughter's] safety because there is no open fire... It has turned the kitchen into a place where they can be curious and helpful without me being in constant fear of an accident."* (Caregiver, survey)

This safety net empowered the next generation, with her daughter with a disability and younger daughter beginning to cook—a direct realization of the pathway's final outcome.

Independence was also about reclaiming time and reducing drudgery and physical strain. The ability to multitask without the fear of food burning was a key enabler. The rice cooker's 'keep warm' function and the induction's stable temperature control were cited as reasons for this newfound freedom:

> *"Time is saved because I don't worry about food burning. I can sit nearby and attend to other things while the food cooks."* (Woman with cerebral palsy, survey)

The survey revealed how one woman with an orthopaedic disability found relief from physical pain, a major barrier to her independence. Her favourite appliance was the Food Processor for kneading dough:

> *"It has helped immensely... it takes literally 3 mins for me to prepare the dough... and I have much less pain in my arms now. It used to take me at least 15-20 mins."* (Woman with orthopaedic disability, survey)

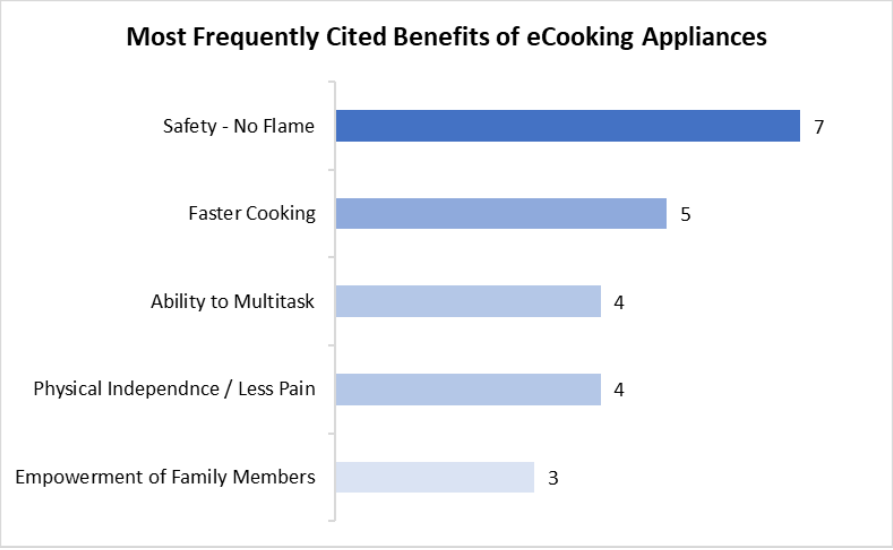

Figure 33: Key Benefits Reported by Participants in the Survey by Thematic Frequency

As Figure 33 illustrates, the benefit of "Safety" was universal throughout the survey, forming the foundation upon which other benefits like physical independence and family empowerment were built, directly supporting the pathway model in Figure 32Figure .

The cooking diaries gave added depth to the findings of the survey on how eCooking facilitated agency and ultimately, independence. A woman with cerebral palsy described

how she had found 'great independence' in her kitchen since she had begun using an induction and rice cooker:

> *"…I have found great independence in my kitchen since I started using an induction cooktop and a rice cooker. Yesterday morning, I prepared spinach curry (Palak ni Bhaji) on the induction, and I've discovered that I no longer need any assistance to sauté my spices, onions, or tomatoes […] Despite my disability, I no longer have to rely on anyone else because I can reach everything I need while sitting down, and I can even plug in the induction and rice cooker myself. This has made my routine much faster; if I begin cooking at 10:50, my meal is often ready by 11:00, which is essential since my husband returns home for lunch at 12:30 […] For now, I am enjoying the fact that I can prepare all my morning and evening meals—from dal and rice to various curries—entirely on my own."* (Woman with cerebral palsy, audio diary, 7/1/2026)

> *"Using the induction cooktop has completely changed how I feel about being in the kitchen; I no longer fear getting burnt because when I lower the temperature, the pan cools down very quickly. On my old gas stove, the oil would get so hot that I was constantly worried about being scalded or having the cooker fall off and land on my feet, which was a real danger. This was especially stressful when I was tempering spices like mustard and cumin; the empty cooker was often unstable and would tip over while I was trying to stir the spices. Now, if I feel the oil is getting too hot or might splash, I simply lower the temperature setting."* (Woman with cerebral palsy, audio diary, 8/1/2026)

Observations in the field identified that the increased sense of independence for this woman with cerebral palsy was shaped by different factors. At the heart of it was a high level of intrinsic motivation. Undeterred by the initial difficulty she faced with buttons, her persistence led to her independent navigation of the eCooking appliances, leading to experimentation with new dishes, and an overall reframing of cooking from a 'chore' to an enjoyable activity.

Independence was facilitated through the fact that the eCooking appliances made the overall process of cooking more comfortable, and even made PwDs *"happy"* (Visually impaired woman) as participants no longer had to rely on neighbours or family. The experiences of the PwDs highlight a significant shift toward independence, safety, and efficiency in the kitchen. The depth of impact that a sense of independence had on PwDs was evident through narratives and experiences shared through workshops and interviews:

> *"It feels good to not have to wait for someone to come home to help me. There is much less dependence now. There is a deep satisfaction in being able to do things on my own."* (Woman with orthopaedic disability, interview)

The support of family was a critical component of ensuring independence. One woman described how her husband was supportive of her having an induction cooktop in her bedroom, as she does not use her artificial leg inside the house, and it prevents her from having to "drag herself" to the kitchen for hot water. She described how she believes that for a person who is physically challenged, these appliances allow them to get *"somewhere from nowhere."* While able-bodied people might rely on their own skills and ignore these tools, she views them as essential for her independence.

Agency and independently managing cooking was directly related by PwDs to the transition away from gas cooking and towards eCooking. One woman with an orthopaedic disability made a direct comparison during discussions in the co-design and creative workshop to the transformative impact being able to use a simple switch herself to power a cooker makes, in contrast to the dependency on her son for the manual, physical handling of the gas cylinder she previously needed:

> *"But one of the most important things that stands out for me while these appliances is that I don't now have to depend on anyone if my gas gets over, I can independently still cook the entire meal, and this is what happened the other day. My son was surprised that I finished cooking by the time he got back to change the gas bottle!"*
> (Woman with orthopaedic disability, co-design and creative workshop)

3.4.2 Integration Friction: The Unresolved Challenge of Physical Design and Workflow

A survey towards the end of the study identified that while the core cooking function was praised for aspects such as facilitating independence (to a certain extent), the integration of the appliances into the physical space and daily workflow of the users presented persistent challenges. The benefits of "smart" cooking were often offset by the "silly" friction of moving and setting up the hardware.

3.4.2.1 The "Transit Dependency"

Whilst qualitative data indicated that the portability of eCooking was viewed as a benefit for some, the survey reflects that this was not universal, and was in fact a challenge for some. The survey revealed that most participants with orthopaedic disabilities could not leave their eCooking appliances permanently plugged in due to constrained living spaces, safety concerns—particularly in households with children—and the absence of dedicated or accessible counter space. As a result, the appliance often had to be taken out, positioned, and plugged in each time before use, and then stored away afterward. This recurring need for setup created what may be termed a **"transit dependency"**—a reliance on caregivers not for the act of cooking itself, but for preparing the physical environment or "stage" on which cooking could take place. Thus, even where task-level independence was achieved, environmental and spatial limitations continued to mediate autonomy. Whilst interviews emphasised portability as an asset, the survey presented it

as a clear barrier, reflecting a divide on apparent benefits. As one woman explicitly stated,

> *"While I am independent in cooking, I am dependent on 'transit'…Their weight makes them difficult to move, requiring me to rely on my daughters or husband."*

Another woman echoed this, noting her father must help her move the induction, and that this effort made her *"lazy"* when in a hurry, leading her to default to LPG.

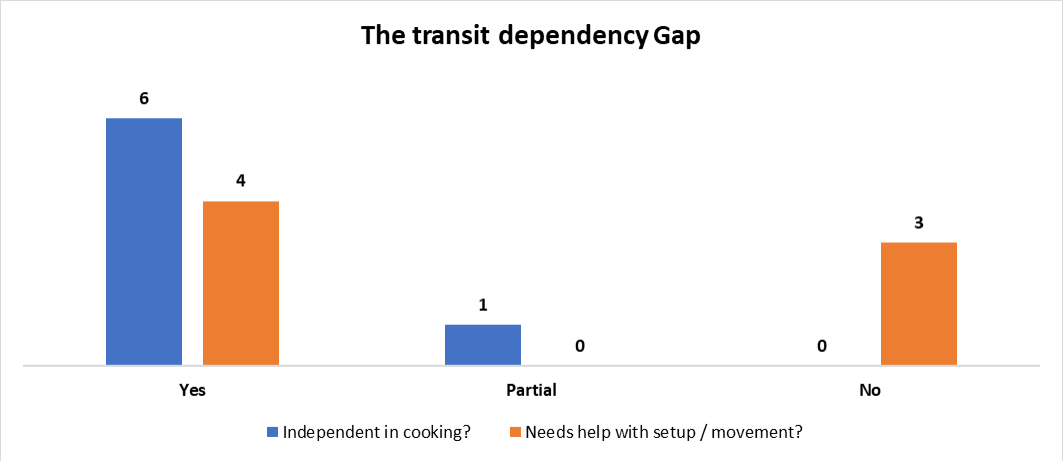

Figure 34: The "Transit Dependency" Gap

While Figure 32Figure and Figure 33 celebrated the independence gained through eCooking, Figure 34 reveals a critical paradox: **independence in the cooking process does not guarantee independence in the cooking workflow.** Over half of the participants who could cook independently still required assistance to move the appliance into position or connect it to the power source. This "transit dependency" represents a critical design gap: the promise of empowerment is undercut by the physical friction of setup. Even an orthopaedically challenged woman, who was fully independent in handling the appliances, was an exception rather than the rule. For eCooking to deliver on its full potential, the physical logistics of placement and storage must be considered as carefully as the cooking interface itself.

3.4.2.2 Maintenance as a Deterrent

For some, the additional maintenance tasks associated with the new appliances acted as a deterrent. One caregiver described in a survey how she viewed the rice cooker as a "*burden of maintenance,"* preferring to use her larger, single-vessel pressure cooker to minimize washing. Even appliances given in support of eCooking, such as food processors, were not universally accepted due to the time foreseen taken up in washing.

Figure 35: "The downside of using Food Processor is the amount of utensils I have to wash after the usage. It's such a hassle for me to wash them all one by one, I don't like doing it much." (Photo © Soni Chandrika)

One woman with an orthopaedic impairment avoided the food processor entirely, stating,

> *"I'm afraid it'll break if I put it into wash. Plus, there are so many utensils I have to wash if I use Food Processor. It's tiring."* (Woman with orthopaedic impairment, survey)

For her, the time saved in cooking was potentially lost in cleaning.

3.4.2.3 Unresolved Safety Feature Conflicts

In a few cases, eCooking technology safety features clashed with traditional cooking methods, creating new frustrations. The survey revealed how one orthopaedically impaired woman's experience with the induction cooktop's auto-shutoff feature, triggered by oil droplets from tempering, is a prime example. What is designed as a safety feature became a *"disruption,"* forcing her to restart her process. This highlights a gap between the appliance's programmed logic and the real-world, messy practices of regional cuisines.

These **"integration frictions"** are critical because they represent the gap between the appliance working in isolation and it working within the complex ecosystem of a person's

home and life. The promise of independence is undercut when the user remains dependent on others for the logistical "before and after" of the cooking event.

3.4.3 The Trust Spectrum: From Fearful Scepticism to Confident Mastery

The survey revealed how participants' relationships with the technology were not static; they evolved dynamically over the course of the study, creating a clear and observable **"Trust Spectrum."** At one end were those who achieved complete mastery, integrating the appliances seamlessly into their daily routines and experimenting with advanced functions. At the other end were those for whom a single psychological or sensory barrier halted adoption entirely, restricting them to the most basic uses despite the absence of physical or cognitive limitations.

This spectrum is not merely a descriptive tool; it represents a **trajectory of engagement** that illuminates how users navigate the intersection of technology, disability, and domestic life. Understanding where a participant falls on this spectrum—and more importantly, *why*—is essential for designing eCooking programme interventions that can move users from fear towards confidence.

3.4.3.1 The Quantitative Foundation: Fear Across Participant Types

Before examining the spectrum qualitatively, it is instructive to understand how fear and hesitation are distributed across the participant sample. Figure 36 provides this quantitative foundation from the survey.

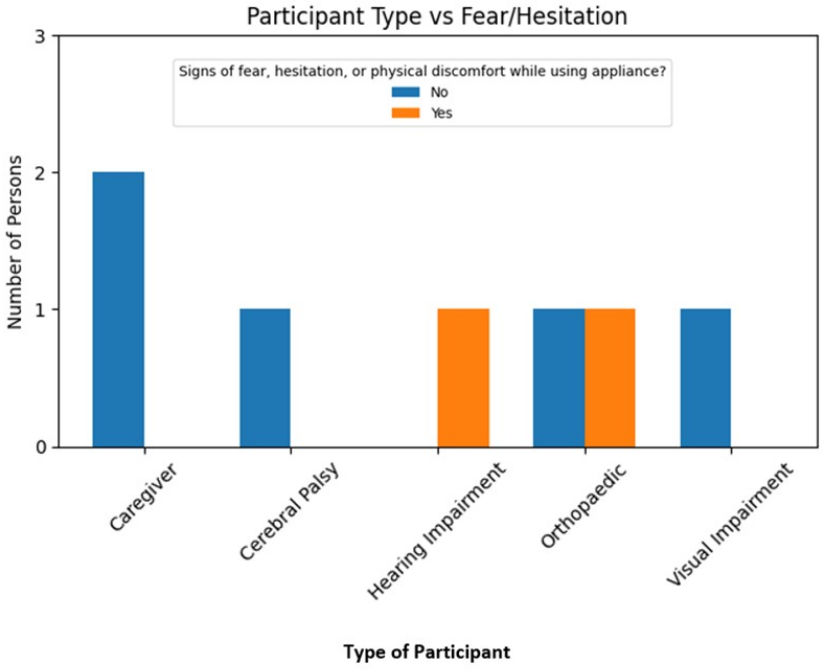

Figure 36: Participant Type vs. Signs of Fear/Hesitation

The distribution of fear and hesitation across participant categories, as identified in the survey (Figure 36) reveals a crucial insight: **fear was not inherent to any specific**

disability. While every category reported at least one instance of hesitation, the responses were often split. Among participants with orthopaedic, hearing, and visual impairments, the ratio was an even 1:1—indicating that two individuals with the same impairment could have vastly different emotional responses to the identical technology.

This finding reinforces the qualitative observation that trust is mediated by a complex interplay of factors: individual psychology, prior exposure to technology, the nature and quality of support received from family, and even sensory sensitivities. The disability itself is not the determinant; rather, it is the individual's *relationship* to the technology that shapes the outcome.

The only category where "No Fear" dominated was among Caregivers (2:1), suggesting that their existing familiarity with kitchen management may provide a confidence buffer. Having spent years navigating the risks of LPG stoves, hot utensils, and complex cooking processes, caregivers approached the new technology with a seasoned pragmatism. However, the presence of fear even within this group—exemplified by one caregiver's initial terror of *"the electrical current"*—confirms that the emotional hurdle of adopting eCooking is a fundamentally human one, not confined to PwDs.

The single participant with cerebral palsy, while reporting no fear, required significant assistance from a family member to operate the appliances. This distinction is critical: **the absence of fear does not always equate to complete independence.** A user may feel perfectly confident yet remain physically dependent on a caregiver for setup, navigation, or cleaning—a nuance that quantitative measures alone cannot capture.

Building on this overview of *who* experienced fear, we can now examine *how* these experiences translated into three distinct patterns of adoption along the Trust Spectrum.

3.4.3.2 The Trust Spectrum: Three Patterns of Adoption

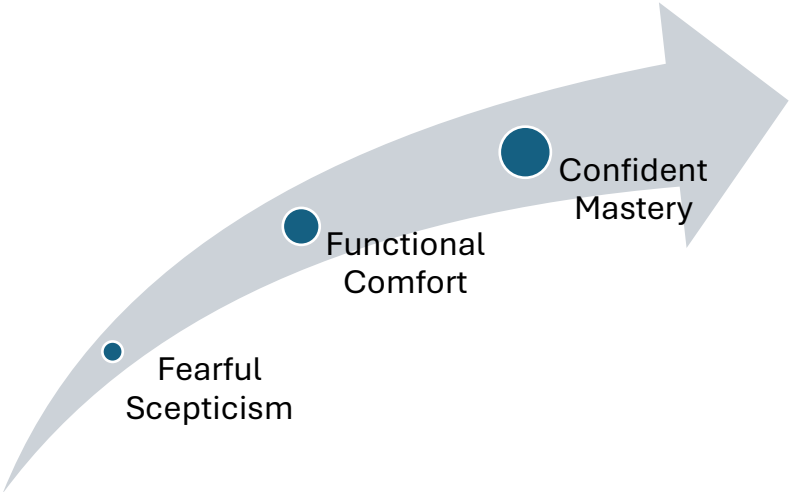

Figure 37: The Trust Spectrum

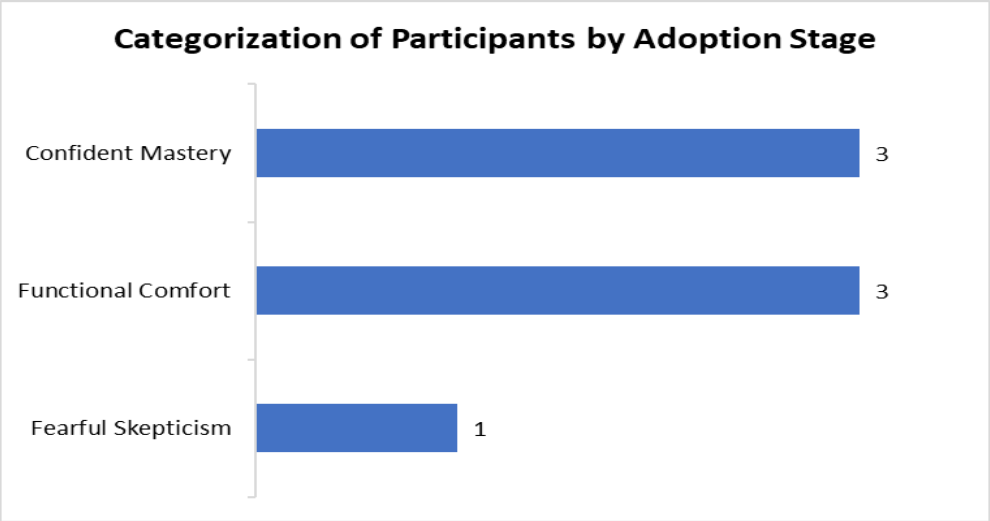

Figure 38: Categorisation of Participants by Adoption Stage

As Figure 38**Error! Reference source not found.** illustrates, the survey revealed how t he pathway to mastery was not uniform. The largest cohort reached **Confident Mastery**, driven by curiosity and positive reinforcement from successful cooking experiences. A significant portion plateaued at **Functional Comfort**, where the technology was useful but not fully utilised. One participant remained in a state of **Fearful Skepticism**, representing a critical outlier whose experience offers profound lessons for inclusive design.

3.4.3.2.1 Confident Mastery: Curiosity, Experimentation, and Positive Reinforcement

At the far right of the spectrum lies **Confident Mastery**. Users including a caregiver, and a woman with an orthopaedic disability, a woman who was hearing impaired, and a woman who was completely blind, exhibited high technical intuition and a willingness to experiment with functions beyond the basics.

What distinguished this group was not the absence of initial hesitation—several admitted to early caution—but their ability to **move through and beyond** that hesitation. Their confidence stemmed from a positive feedback loop: each successful dish reinforced their sense of competence, encouraging them to try the next recipe, the next function, the next challenge.

One woman's journey from cautious to confident is telling:

> *"In the beginning, I was cautious and kept my daughter-in-law by my side... But now, all the fear is gone. I've found a temperature system (100-200) that works for me, and I'm confident using the machines alone."* (Woman with orthopaedic disability, survey)

Her statement reveals a key mechanism of mastery: the development of **personalised mental models**. Unable to read the English presets, she created her own system based

on temperature numbers—a workaround that gave her control without requiring literacy in the interface. This level of mastery was in stark contrast with the repeated handholding she required at the start of the process, which gradually, but ultimately led to independent usage.

One caregiver's confidence was rooted in a different source: self-belief.

> *"I had not truly doubted my ability to learn these appliances at all... I knew, someday, if I get my hands on the Induction or Rice Cooker and try it a couple of times, I'd be able to use it with ease. I was just happy that I was right about my own thoughts around it."* (Caregiver, survey)

This caregiver's experience highlights the role of **pre-existing technological self-efficacy**—a trait that, while not universal, can be cultivated through exposure and encouragement.

For one hearing impaired woman, mastery extended beyond personal use to **community demonstration**. She showed the appliances to her neighbours, who praised the features and celebrated her capability. This external validation further reinforced her confidence, creating a social dimension to the mastery experience.

> *"I have always felt confident about using technological machines. They fascinate me and I am eager to learn about them. The family also trusts my capability to operate it independently."* (Hearing impaired woman, survey)

Cooking diaries revealed how 'Confident Masters' went as far as looking up entirely new recipes on YouTube to try with the appliances:

> *"Today I cooked masoor dal and rice on the induction, I didn't use the EPC today. It took me 10 minutes as I pre-soak all my dals before cooking. I feel very excited to try new recipes on these appliances. My neighbours also come and see me cook on the appliances and say "dekho […] bhabhi kitna khush hokar banati hai iss par" ["look how happy our sister-in-law is cooking on this"]. I usually cook a lot of chicken items. I learn new recipes from YouTube and then try it on these appliances. The taste seems the same to me from when I cook on the gas stove. I cooked for 4 people today."* (Audio diary, woman with orthopaedic disability, 7/1/2026)

An interview with this woman revealed how on witnessing this level of Confident Mastery in the kitchen, her neighbours began to enquire about the eCooking technologies, and depending on their household income, considered buying EPCs for their own households. In turn, after mastering the EPC, she was more than willing to teach her neighbours how to use it. This particular 'Confident Master' was contemplating setting up her own YouTube channel after encouragement from her neighbours, to create a platform for her to share her own eCooking recipes, transforming her from student to teacher.

Workshop discussions revealed how those who had reached this state of mastery had begun to contemplate life beyond the study in their kitchens. As one woman said in the co-design and creative workshop, she,

> *"…had made a mental note that the day I have saved some money, I will purchase this appliance for myself because it looks cool and seems efficient for someone like me. So, the day I received it, I started using it. I like trying new tech-based appliances, what helps is having a friend who works in the same field."*

A critical phenomenon observed was that when barriers arise in the transition to eCooking, PwDs innovate. Participants demonstrated ingenuity by troubleshooting E4 errors in the EPC themselves, opening the appliance, identifying issues, and repairing them. This challenges common assumptions and highlights the resourcefulness present within the disabled community.

The Confident Mastery group demonstrates that when the conditions are right—when curiosity is encouraged, when early successes are achieved, when family support is present—users can transcend the limitations of the technology itself, developing workarounds and mental models that unlock the appliances' full potential.

3.4.3.2.2 Functional Comfort: The Plateau of "Good Enough"

However, not all users progressed to this level of mastery. A significant portion (two participants) plateaued at what we term **Functional Comfort**. Some caregivers and people with orthopaedic disabilities were satisfied with using a small subset of functions that reliably "worked for them." This plateau maps directly onto the "Yes Fear" responses in **Error! Reference source not found.** for the Orthopaedic and Caregiver categories.

What characterises Functional Comfort is a **self-imposed ceiling** on exploration. These users are not afraid of the appliance in the moment of use—they cook with it daily and appreciate its benefits. But they are afraid of what lies beyond their familiar routines. The unknown buttons, the untested functions, the unexplored settings—these represent risk rather than opportunity. One woman admitted candidly,

> *"I haven't used other buttons of the induction due to the fear that it might stop working if I don't use them correctly. I did see videos in the WhatsApp group where other people have used the appliance extensively but there's still a fear inside that something could go wrong if I try them on my own."* (Woman with orthopaedic disability, survey)

This statement is remarkably revealing. This woman has **social proof** that the functions work—she has seen others use them successfully. Yet the fear persists. It is not a fear of the technology itself, but a fear of ***breaking*** it, of being responsible for damage, of venturing into the unknown alone. This is not irrational; it is a rational response to a design that offers no safety net for exploration.

One caregiver's path to Functional Comfort was shaped by different factors: traditional beliefs and a deeply ingrained philosophy of the kitchen.

> *"Zarurat nathi"* (no need), she explained.

For this caregiver, the eCooking appliance is a tool for specific tasks—making sabzi, boiling tea—not a system to be mastered. Her approach is pragmatic: why learn what you don't need to? This perspective is not a failure of curiosity but a **different value system**, one where technology serves existing practices rather than transforming them.

Yet this value system, while entirely valid, creates a ceiling. The same appliance that could potentially simplify more of her cooking remains partially dormant. The "invisible" English buttons are not worth deciphering because the manual method "works for her." The cost of exploration—time, mental energy, the risk of error outweighs the perceived benefit.

For a woman with orthopaedic challenges and a caregiver, Functional Comfort represents a **rational equilibrium**: they have extracted sufficient value from the technology to justify its use, but not enough to motivate further investment. The tragedy is that this equilibrium is shaped not by their capabilities—both are perfectly capable of learning more—but by design features (language, lack of exploratory safeguards) and psychological barriers (fear of breaking, "no need") that could potentially be addressed.

Beyond the survey and in the study at large, safety was not experienced solely as physical protection; it reduced psychological stress. Participants frequently described feeling calmer, less rushed, and less fearful during cooking. Several described feeling "relaxed" and "tension-free", having overcome a previous "fear of being burnt" associated with gas stoves.

In the study more broadly, interviews, workshops and cooking diaries echoed these sentiments. It was felt that the transition to eCooking for PwDs would be shaped by a sense of hesitation, rooted in concerns over affordability and general unfamiliarity with these 'new' machines:

> *"I think affordability would play the biggest role here in hesitation. In our community, people are very calculative about electricity. They won't even turn on a fan unless it's absolutely necessary. The fear of a high electricity bill stops people from even trying. Fear and hesitation are the second-biggest factors—the fear of the unknown."* (Woman with orthopaedic disability, interview)

> *"I am a caregiver to a child with disability. I have taken Induction and a Rice Cooker. So far, [daughter] has learned how to make Chai on Induction and Rice based dishes in the Rice Cooker. There was of course hesitation earlier due to the unfamiliarity of the appliances, but the biggest advantage for us was the absence of fire. [Daughter] fears fire and refuses to go near but gradually, we have managed to deal with it. The dishes we cooked are safe so far and they have turned out well. [Daughter] is more*

fearful due to her inexperience but I have insisted and assisted her in using them which has helped a bit." (Caregiver, workshop 2)

One visually impaired woman noted that her confidence in using the eCooking appliances increased in large part due to her family. Her children, including her partially visually impaired daughter, were critical in her transition from using gas to electricity for cooking, in particular in providing the support and encouragement she required to motivate her to use the appliances. This woman went through the process of learning how to use an induction through trial and error, with her daughter and other family members around as vital motivational support.

Over time however, shifts in these dynamics were observed. Some PwDs went from those who were being taught how to use eCooking appliances, as they made the journey towards "Confident Mastery" as they slowly went beyond their comfort zones, to those leading the transition away from biomass in their homes by teaching their families how to use the appliances. PwDs went from recipients of appliances to being vital in ensuring their wider uptake:

"I heard that other participants keep one of their family members around for supervision or assistance. I'd like to say that I also keep my family members around but for a different reason – to teach them as well, especially my mother-in-law. I feel confident about using these appliances and I want them also to try it so that they are able to operate them in my absence as well and that'll make things easier around the house." (PwD, workshop 2)

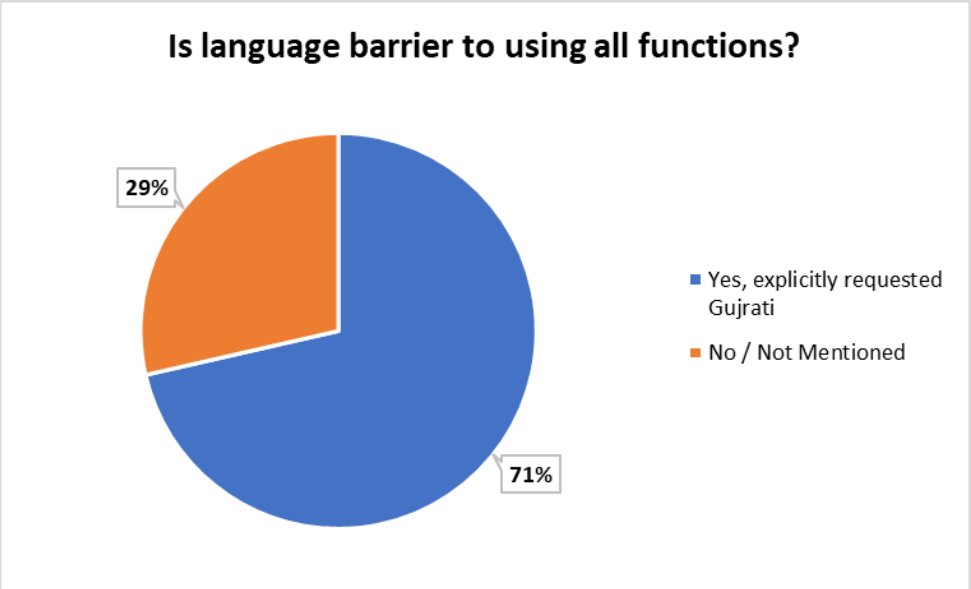

Figure 39: Language as a Barrier to eCooking appliance use- Frequency of survey mentions

3.4.3.2.3 The Invisible Interface: Language as a Barrier to Empowerment

A striking and consistent barrier across both surveys was the **English-language interface**. For participants whose primary language was Gujarati, the preset buttons were, as one researcher noted, "invisible." This illiteracy in the technology's language was a primary reason for the "functional comfort" ceiling observed in the second theme of the Trust Spectrum.

Figure 39Figure 39 quantifies what emerged qualitatively from the survey as one of the most consistent barriers in the study. For **71% of survey participants (five out of seven)**, the English labels were not just difficult—they were a functional roadblock. This was not merely an inconvenience; it was a direct cause of the "Functional Comfort" plateau described earlier.

One critical barrier that emerged from the use of the induction, for example, was missed functionality, and a simple unawareness of which buttons performed which function. The survey revealed how a highly intuitive woman with cerebral palsy, who creatively repurposed the 'Milk' and 'Kettle' functions, was simultaneously limited by the interface. She struggled with deep-frying because she was unaware of the dedicated 'Fry' button and faced the "FS error." Her simple request was,

> *"Provide Gujarati translations for the buttons so I can understand all the functions properly."*

The survey revealed that the language barrier reinforced participants' fears of exploring the technologies as part of their daily cooking routines. As one less confident PwD said, the unknown text on the buttons was a direct contributor to her fear of exploration. She stated that Gujarati translations would be the only thing that would encourage her to try the presets.

Narratives from the survey identified that there was a universal appeal among the sample for eCooking appliance design to be localised with consideration of language. The only two participants (29%) who did not cite language as a barrier were exclusively those who had already achieved "Confident Mastery", suggesting that high technical confidence may compensate for inadequate interface design, but should not be relied upon as a design strategy. The near-universal call for localisation—from the hesitant caregiver (*"it would be much better if the functions were written in Gujarati"*) to the highly independent woman with an orthopaedic leg impairment (*"The English labels are the only real problem"*)—underscores that accessibility is not solely about physical design, but also about **cognitive and linguistic inclusion**.

This data from the survey powerfully illustrates that accessibility is not solely about physical design; it is also about **cognitive and linguistic accessibility**. The interface, designed with a one-size-fits-all approach, inadvertently created a significant barrier for a population that could otherwise benefit immensely from eCooking technologies' full capabilities.

3.4.3.2.4 The Caregiver's Dual Role: User and Facilitator

Before examining the far end of the spectrum, it is important to recognise that the "caregiver" category in this study occupied a **dual role** that distinguishes their experience from that of PwDs.

Some caregivers were **primary users** themselves, embracing the technology enthusiastically for its efficiency and speed. The survey revealed how for one caregiver, the appliances were tools of personal empowerment and household management, allowing her to host guests without panic and devote more time to family. Her journey along the Trust Spectrum was self-directed; she was mastering the technology for her own benefit.

eCooking Appliances: Changing the Rhythm of Nasim's Day

Nasim's work is rarely called work. As the mother of two children—her elder son Aman living with a severe intellectual disability and frequent epileptic seizures—her days revolve around constant vigilance, quiet strength, and love. Caring for him is her first priority, even if it often goes unrecognized within the household.

The arrival of e-cooking appliances changed the rhythm of her day. With a rice cooker and induction stove powered by the family's solar panels, Nasim no longer has to stand anxiously over an open flame. She adds the ingredients, presses a button, and the cooker does the rest. The "warm" function keeps meals ready until everyone gathers, and the safety features allow her mother-in-law to help without fear.

For the family, the appliances save money. For Nasim, they offer something far more valuable: peace of mind. Freed from constant worry about the kitchen, she can sit beside Aman, watching over him—where she feels she is needed most.

In contrast, other caregivers experienced the technology **proximally**—through the empowerment of another person. One caregiver's primary joy came not from her own use of the induction, but from watching her daughter, a PwD, cook safely for the first time.

> *"Seeing [daughter] being able to participate in the cooking process more than she was able to earlier is a big relief for me as a parent."*

This dual burden—managing one's own hesitations (this caregiver admitted to initial terror of "the electrical current") while simultaneously enabling another's independence—adds a layer of complexity to the adoption journey that is not captured when focusing solely on PwD experiences.

Going beyond boundaries for Mumtaaz to realise a daughter's dreams

For Mumtaaz, the domestic sphere was long defined by a series of invisible boundaries designed to keep her daughter safe from the volatile heat of an LPG flame. In a household where caregiving is a constant, high-stakes negotiation, the kitchen was once a restricted zone. The arrival of an induction cooktop and a rice cooker has done more than simplify meal times; it has expanded the horizon of what her daughter can hope to achieve. Mumtaaz now speaks of a future previously unimagined: a kitchen where her daughter is not a bystander to be protected, but a participant. This is a story about the "Safety Dividend": the moment a mother's anxiety is replaced by a daughter's budding autonomy. [Watch: How a flame-free kitchen became a space for a daughter's dreams]

One mother of two children with disabilities, though not present in Survey 2, exemplified another caregiver dynamic from Survey 1: she was confident and inspired by other participants, yet her family remained doubtful. This suggests that caregivers often act as **bridges** between the technology and the PwD, but they themselves exist within a web of family attitudes, fears, and support structures. Understanding the caregiver's dual role—as both user and facilitator is essential for designing interventions that support the entire household, not just the primary cook.

Sumitra Thakore (Caregiver to a child with intellectual disability)

Sumitraben Thakore, caregiver to her daughter Amisha (who has an intellectual disability), now uses the induction cooktop daily for sabzi and chai, relying mainly on the "+" and "–" temperature controls. While she continues using LPG for larger meals like khichdi for her family of five to six people, she acknowledges that induction cooking feels quicker and safer as there is no open flame, no gas leakage, no burnt fingers. Within a week of the usage, her initial fear of electrical appliances had faded. Most importantly, her daughter Amisha was able to cook halwa, sabzi, and chai on the induction under supervision. For Sumitraben, the absence of fire brings relief: she feels less anxious watching her daughter cook and believes e-cooking is especially suitable for people with special needs.

Yet, unlike many participants who valued the ability to multitask using timers, Sumitraben firmly believes that a *rasoi* should never be left unattended. In an era of "smart" multitasking, Sumitraben is a traditionalist. Even when using induction, she stays present and would rather switch it off than rely on automated functions. Language also limits her experimentation, with functions labelled in English, she uses only what she confidently understands. Her journey reflects a partial but meaningful shift: the technology has reduced fear and enabled her daughter's participation, but deeply rooted beliefs about vigilance, responsibility, and control in the kitchen continue to shape how fully its features are adopted.

3.4.3.2.5 Fearful Skepticism: The "Soft Failure" of Technology Adoption

At the far left of the Trust Spectrum lies a state of **Fearful Skepticism**, represented by a single, critical outlier: one woman with an orthopaedic disability from Vatva.

Her case as was demonstrated through the survey constitutes what we term a **"Soft Failure"** of technology adoption—a failure rooted not in physical or cognitive inability, but in sensory and **psychological perception**. This woman does not lack the strength to operate the induction, nor the intelligence to understand its functions. She successfully used it in the past to cook various sabzis. Yet a single sensory trigger derailed her entire adoption journey.

The standard operational noise of the induction cooktop—the hum of the cooling fan, a sound that every other participant accepted as normal triggered an "internal fear" in her, convincing her that her specific unit was broken. This perception became a **total barrier**, restricting her usage to boiling milk and tea, despite her acknowledging the appliance's speed and utility.

"I won't feel fully confident in using it until my fear is gone about the noise."

The research team personally visited her home and verified that the appliance was functioning normally, producing the standard decibel level of a typical unit. Yet she remained unconvinced, despite seeing evidence to the contrary in front of her and from seeing others in the WhatsApp group. The fear had become **cemented**—a psychological block that no amount of external validation could dislodge.

This particular woman's case is instructive for several reasons:

- **Sensory design matters.** What is "normal operational noise" to an engineer or a confident user can be "evidence of malfunction" to a fearful one. The auditory experience of the appliance is not neutral; it carries meaning and triggers emotional responses.
- **Trust, once broken, is difficult to repair.** Her belief that the machine is broken persists despite professional verification. This suggests that for some users, the *perception* of malfunction is as powerful as actual malfunction. The technology must not only be safe but ***feel*** safe.
- **Soft failures are invisible in standard metrics.** If this study had only measured usage frequency, she would appear as a "partial user." If it had only measured physical accessibility, she would appear as "fully capable." It is only through qualitative probing that the true barrier—psychological and sensory becomes visible.

This woman's experience on the far left of the Trust Spectrum serves as a powerful reminder: inclusive design must account not only for what users can do, but for how they *feel* while doing it. The hum of a fan, the stiffness of a button, the glow of a light—

these are not mere details. For some users, they are the difference between adoption and abandonment.

3.4.3.2.6 Implications of the Trust Spectrum

Five key findings emerged from this survey:

1. Safety is the Foundation of Empowerment

The elimination of fire-related fears was the single most universally cited benefit across all participant categories. Every user or caregiver mentioned safety as a primary advantage of eCooking over traditional LPG stoves. This safety served as the prerequisite upon which all other benefits—independence, time savings, family involvement—were built. For PwDs, the absence of open flames and the stability of the induction cooktop transformed the kitchen from a space of anxiety into a space of control. For caregivers, this safety translated into profound psychological relief, enabling PwDs to cook independently for the first time.

2. Trust Exists on a Spectrum, not as a Binary

Participants fell into three distinct categories along a "Trust Spectrum": Fearful Skepticism, Functional Comfort, and Confident Mastery. Crucially, the distribution of fear across disability types revealed that hesitation was not inherent to any specific impairment. Two individuals with the same orthopaedic limitation could have vastly different emotional responses to the technology. This finding underscores that trust is mediated by individual psychology, prior exposure, sensory sensitivities, and the quality of family support—not by disability status alone.

3. Psychological and Sensory Barriers Can Cause "Soft Failures"

The Fearful Skepticism category demonstrates that adoption can fail even when all physical and cognitive barriers are removed. An internal fear triggered by the standard operational noise of the induction cooktop created a total barrier to usage, restricting her to boiling milk and tea despite acknowledging the appliance's speed. This "soft failure" highlights that for technology to be truly inclusive, it must not only be safe but *feel* safe to the user. Sensory design—including auditory feedback matters as much as physical accessibility.

4. Language is an Invisible but Pervasive Barrier

For 71% of participants in the survey (five out of seven), the English-language interface rendered preset buttons functionally "invisible." This was not merely an inconvenience but a direct cause of the Functional Comfort plateau. Some users, despite high technical intuition, remained unaware of dedicated functions like the 'Fry' button. For hesitant users, the unknown text actively reinforced her fear of exploration. The near-universal call for Gujarati translations—from the hesitant to the highly independent underscores that accessibility must include cognitive and linguistic inclusion, not merely physical design.

5. Independence in Cooking Does Not Guarantee Independence in Workflow

A critical paradox emerged from the analysis: over half of the participants who could cook independently still required physical assistance to move appliances into position or connect them to power sources. This "transit dependency" represents a significant design gap. The promise of empowerment through eCooking is undercut when users remain dependent on caregivers for the logistical "before and after" of the cooking event. Addressing this gap requires attention to appliance weight, cord length, storage solutions, and the physical layout of homes.

Ultimately, the Trust Spectrum reveals that adoption is not a binary outcome—used vs. not used—but a **continuum of engagement**. Moving users from Fearful Skepticism toward Confident Mastery requires not only functional technology but also psychological safety, linguistic accessibility, and social reinforcement. The appliance must earn the user's trust at every step.

3.4.4 eCooking: Technologies Creating Happy Chefs

Beyond the survey, there were clear indications that there was one simple emotion that emerged from the data: happiness. Some participants were able to overcome psychological barriers of fear and apprehension and simply **enjoy the process of experimenting** with different dishes using different eCooking technologies that had entered their homes through trial and error, as revealed by cooking diaries. For those who were able to enjoy it and be happy, it was often rooted in finding that the appliances worked specifically for them:

> *"I enjoy using the appliances, especially the rice cooker and find the process easy and simple. The sweet sev was "wonderful" in taste."* (Woman with visual impairment, telediary, 6/1/2026)

> *"Today I have made khichdi on the electric sagdi. While making the khichdi, I set the temperature at 400 and let it cook on low heat. Cooking it on low heat makes it taste good. When such appliances come into our home, we feel happy using them."* (Woman with orthopaedic disability, audio diary, 6/1/2026)

For others, happiness was grounded in familiarity and gaining experience:

> *"I feel like I am becoming more experienced with the induction cooktop, similar to how one gains experience in life after marriage, and I am truly enjoying cooking on it."* (Woman with visual impairment, telediary, 14/1/2026)

> *"I'm so glad I have these things and I'm so happy I'm making food and using them."* (Woman with orthopaedic disability, audio diary, 6/1/2026)

3.4.5 Modernity and Digital Confidence with A New Companion in the Kitchen

The integration of eCooking appliances into the kitchens of households with PwDs had a clear impact on an overall sense of modernity for participants, who up until the start of

the study were largely cooking with biomass fuels. One user noted, *"I feel the food gets cooked magically so fast",* while another remarked that the appliances felt like a "companion" helping her. One participant proudly shared that her guests now consider her "standard" (sophisticated) because she uses such modern equipment.

Beyond functional utility, the appliances carried symbolic meaning, linked to identity, modernity and digital confidence, through technical agency. Several participants described their kitchens as having become "*digital," "modern," "magical"* or *"standard."* Navigating buttons in English and presets enhanced feelings of digital competence, even among those with limited formal education. One woman described how receiving these appliances was a deeply emotional milestone for her and her husband, with a deep feeling that her home was truly on a path to becoming "digital." She was so moved that she recorded a video on her mobile phone, documenting her kitchen and reflecting on how modern her life had become. She expressed a sense of personal transformation, stating that she feels "literate" and "modern."

> *"I really like these products; it feels like my whole kitchen has completely changed."*
> (Woman with orthopaedic disability, interview)

While she maintains traditional boundaries—noting that it is not very her to be overly sociable and that her husband accompanies her to work as a protector—she feels that this study has expanded her horizons. She describes her newfound confidence by comparing herself to a bird that can finally fly, feeling that the possibilities for her life are now endless. Moreover, the couple's final feedback was that cooking this way is "fun" and keeps them updated with the digital world. They were looking into purchasing a *Tawa* (griddle) that is compatible with Induction so they can eventually make *Roti* as well.

3.4.6 Family Dynamics: An Ever-Present Guest at the Kitchen Table

The introduction of eCooking appliances into households with PwDs demonstrated that whilst technologies may change, factors such as gender and family dynamics remain critical players in the dynamics of the kitchen, with or without cooking devices that rely on electricity. In the field, recognising that cooking is deeply rooted in the domestic roles of women, the introduction of these machines served as a strategic "entry point." This alignment with existing cultural roles facilitated stronger engagement and allowed for the building of deeper relationships with the female participants.

Digital confidence came into sharper focus when the contexts of household and family dynamics were considered. For some hearing-impaired participants, successful appliance uses directly countered familial narratives that they "would not be able" to manage such technology. The act of independent use became a subtle form of identity renegotiation within the household. eCooking technology thus operated not merely as a tool, but as a medium through which participants reconstituted self-perception from dependent to capable, from traditional to modern.

In some cases, it became clear that the introduction of eCooking technology had little impact on gendered expectations in the family. Whether it was gas or electric, some women with disabilities were still expected to be entirely responsible for cooking for the family. Yet, the adoption of eCooking and supportive technologies were in some cases shaped not only by the expectation that the daughter-in-law of the house who had a disability would cook, but that she would cook with traditional techniques alone. A major factor for one woman who was orthopaedically impaired in her use of a food processor to support her eCooking was the move from her mother's home to her husband's home. In her husband's house, established routines are strictly followed, and she feels she must prioritize her Mother-in-Law's (MIL) comfort. When she attempted to chop vegetables in the food processor, her MIL expressed a preference for manual chopping. Consequently, she slowed her adoption of the machines to avoid disrupting the household hierarchy, noting it will take time to convince her family to adapt to new ways. However, she anticipated the appliances being vital during her menstruation period (when she may stay out of the kitchen), pregnancy, or times of illness. She noted that even out of curiosity, others might be more willing to help her if they get to use such "modern" tools.

eCooking technologies had a notable impact in some households: men started to enter the kitchen. In several households, family members—particularly sons, fathers, and partners—acted as catalysts. For instance, younger male members often encouraged experimentation with new recipes, framing the appliances as technologically exciting rather than risky. In some cases, male partners began participating in cooking activities, suggesting that technology subtly disrupted gendered boundaries around domestic labour. Technology became the medium for partners to engage more in cooking, particularly in households with women with orthopaedic disabilities. The stories of two households bring the role of men in eCooking into sharp focus. For one woman who was orthopaedically impaired, the involvement of her partner, who had low vision, was a critical catalyst in her culinary explorations with her EPC. This man helped this woman in the kitchen, taking responsibility for bringing down and putting away the EPC on high shelves for her in the little space they have available to them at home. Yet his involvement in this eCooking journey went far beyond bringing the EPC down to her level. He used a mobile phone to film his partner's eCooking journey and support the curation of her video diary, giving a live commentary as she cooked different dishes. He spoke more than his relatively quiet partner, which was critical in giving voice to her experiences. But his role was more than that of a filmmaker: by proactively encouraging his partner to try and make new dishes with the eCooking appliances, he became the vital support she needed to dare to expand her culinary knowhow, with technologies that were entirely new to her.

In the second case, a couple who both had orthopaedic impairments, the woman, as with other households, was the 'Head Chef'. Whilst her husband did not personally cook with the EPC and the induction, he played a very important and active role in guiding and supporting her. He took the lead in assisting her to set the correct temperatures and ensured that she was following the proper operational methods throughout their daily

eCooking routines. As the wife tended to be forgetful, having her husband by her side was vital in ensuring no mistakes were made with these new technologies.

Families became catalysts for empowerment. In several homes, children or spouses were instrumental in encouraging first-time use. For one woman who was fully visually impaired, her children's support empowered her to overcome button-related confusion. An interview with a woman with an orthopaedic disability revealed how her family took to the induction cooktop quickly, with her children making tea with it. Whilst she remained the primary cook with overall responsibility for feeding her family, as was the case for many of the women, her children were driven and excited to learn what they could with the appliances, with enough caution. This woman's children were especially glad because it meant their mother could keep the fan turned on and keep cool when cooking with them. In this case, the woman's husband was also using the appliances to make tea and simple dishes when she was either away or sick. The introduction of eCooking technologies in households with PwDs therefore empowered families to use them, and even if this was a micro-level use for something as simple as a cup of tea, it paved the way for men and boys to get involved in cooking. For women caregivers, the appliances became a tool for teaching other family members, so that the household is less dependent on them.

Cooking diaries and field observations also revealed that PwDs' fathers had a role to play in their eCooking journeys. One visually impaired woman's father was a key source of motivation for her to use the appliances and gain the confidence she needed. Yet this motivation was not always through spoken form. Instead, her father took to the induction cooktop himself, making tea for his family in the morning for his family, to inspire his daughter to use it and build her own confidence. Fathers were found to physically stand by their daughters in the kitchen as a source of encouragement, gradually building the confidence of PwDs. One orthopaedically impaired woman was gradually able to use an induction cooktop and transition from a dependent to an independent user, due to her father's supervised mentorship to cook with the appliance, overcoming her initial fear of electrical accidents linked to disability.

Gender dynamics were visible through different family generations in households with PwDs. One woman with an orthopaedic disability described how both of her sons had showed an interest in using the EPC themselves, having seen their mother use this new technology. The role of boys and men in supporting eCooking however was not only intergenerational but was critical at an **intragenerational** level too. PhotoVoice (Figure 40) revealed how one woman's younger brother was key in teaching her how to use the induction cooktop, because she would regularly forget the functions and needed repeated instructions from him.

Figure 40:: "Sometimes I struggle with remembering functions of the appliance. Having my brother around has helped a lot as he understands the nitty-gritties of an electronic appliance better than me" (Photo © Soni Chandrika)

In this particular instance, the intragenerational dynamics between the brother and sister had impacts on the family generation before them. By working together to enable the woman to learn how to use the induction cooktop, the sibling duo managed to reduce the physical burden of feeding the family that was previously placed on their mother, who was living with a chronic condition that limited her ability to cook.

Conversely, household hierarchy could also restrict access to eCooking, demonstrating how eCooking adoption goes far beyond the supply of appliances to the household. Among VI and HI participants, scepticism from family members, including from other women, was observed. Where another woman (e.g., a sister-in-law) was the primary cook, participants lacked agency to independently adopt the appliances. However, successful navigation of the appliances frequently challenged pre-existing assumptions about their capabilities, resulting in increased recognition and confidence within the household. In the case of a HI woman, her initial low participation in the study was directly linked to household hierarchy, not disinterest. It was found that her sister-in-law restricted her access to the kitchen as she was the primary cook, preventing her from using the eCooking appliances. When research follow-ups identified these gatekeeping dynamics and expanded training to include the primary cook, participation increased significantly. This underscores that technology adoption in domestic contexts must

account for intra-household power structures rather than assuming individual autonomy.

One visually impaired woman's case demonstrates the intrinsic role gender and family play at a household level when it comes to eCooking, which revealed a stark contrast between the professional and domestic spheres for women with disabilities' identities. Professionally, her leadership role in the Blind Person's Association in Ahmedabad shaped her commitment to and support of the research. The professional demands placed upon her required the team to implement flexible follow-up schedules. At home however, her identity as a mother came to the fore, and she faced scepticism from her son regarding her involvement in the study. This underscores the fact that gender and household dynamics inherently shape the cooking experiences of PwDs irrespective of whether the fuel for the stove comes from a gas cylinder or a plug point.

In some cases, the physical intervention of daughters was critical to enabling PwDs to cook:

> *"My mother also cooks; she makes tea, vegetables, or halwa. Because she has limited eyesight, I help her by plugging it in and setting the buttons, but she handles the actual cooking. She has now learned how to turn it on and off and how to adjust the temperature."* (Daughter of woman with visual impairment, telediary, 11/01/2026)

One orthopaedically impaired woman described how her husband was supportive of the eCooking appliances, particularly the induction she kept near to her bedside, because she does not use her artificial leg inside the house. This woman's husband saw the benefit of the portability of an induction cooktop, which as it was kept in the bedroom, prevented his wife from dragging herself to the kitchen.

At times, women showed concern for the safety of younger generations of their families:

> *"When my niece or nephew visits, I put the appliances away. I'm afraid they'll touch the wires. If a child gets hurt, the accountability is on me, so I just avoid the risk."* (Woman with orthopaedic disability, interview)

While curiosity initiated experimentation, sustained adoption was most strongly associated with functional necessity, largely grounded in gendered roles in the household, as most of the sample were women. Participants who experienced illness (personal or within the household), increased caregiving burden, or sudden shifts in domestic responsibility demonstrated accelerated and deeper integration of the appliances into daily routines. For women caregivers of children with disabilities—including epilepsy and other special needs—the timer function on eCooking technologies emerged as particularly significant. It allowed mothers to momentarily redirect attention without compromising cooking safety. These micro-intervals of relief were repeatedly

described not merely as time savings but as mental decompression in otherwise high-intensity caregiving environments.

Similarly, in households where illness temporarily shifted cooking responsibilities, adoption occurred rapidly when the appliance addressed immediate strain. These patterns suggest that perceived utility under conditions of constraint is a stronger determinant of sustained use than novelty or aspirational appeal alone. Overall, gender consistently shaped PwDs' and caregivers' eCooking journeys.

3.5 Inclusive eCooking: An Economic Opportunity for PwDs and Caregivers?

Economics and financial implications were not a key focus of this study, as all appliances were provided free of charge of to all participants. Therefore, this data does not consider the upfront costs of purchasing eCooking appliances and focuses only on ongoing electricity costs identified during the study.

The survey showed that the economic calculus of eCooking adoption varied widely. Some users viewed the shift as cost-neutral, noting that savings on LPG offset any increase in electricity bills. Others remained uncertain about the financial impact. One caregiver expressed a nuanced concern about LPG wastage if the cylinder went unused—a perspective reflecting the complexity of transitioning between fuel sources in resource-conscious households. Most notably, one participant saw beyond household savings to income-generating potential, proposing to use the Food Processor and Induction to start a small tiffin service. This finding suggests that the value proposition of eCooking extends beyond domestic labor savings into economic participation—an area warranting further exploration.

Perceptions about the economic impact ranged from confident cost-savings to uncertainty, and even to concern. One PwD and one caregiver viewed the transition as cost-neutral or beneficial in terms of financial savings, with one woman noting that any increases in her energy bill from eCooking were offset by savings made on LPG cylinder refills:

> *"Even if the electricity bill goes up, I am saving money on LPG, so it balances out."*
> (Woman with orthopaedic disability, survey)

One caregiver's household benefited from their own solar panels that they had installed before the study began, making the induction particularly cost-effective. Electricity-based cooking further reduced fuel costs, reframing eCooking as economically advantageous rather than supplementary. The survey revealed that two participants did not know about the economic impact of eCooking on their household, showing that the economic case for eCooking is not always clear cut in the eyes of the user. However, one caregiver presented her concerns clearly:

"If she [daughter with disability] regularly uses [induction], the cylinder may not be used and may become a problem." (Caregiver, survey)

This caregiver expressed a concern rooted in resource optimisation: if the induction replaced LPG for daily cooking, the cylinder might go unused, leading to wastage—a nuanced perspective that reflects the complexity of transitioning between fuel sources in resource-conscious households.

Two participants remained uncertain about the financial impact, suggesting that the economic case for eCooking is not always self-evident to users.

Most notably, one hearing impaired woman saw beyond household savings to **income-generating potential**:

"We can grind spices, lentils for our food stall and think of starting a tiffin service." (Woman with hearing impairment, survey)

Figure 41: "Before the food processor arrived, it used to take us an hour to chop all the onions and tomatoes for the food cart. Now, it takes a minute to get everything done and we are able to save a lot of our time which helps me finish other tasks and go to my vocational classes on time." (Photo © Soni Chandrika)

She proposed using the food processor and induction to grind spices and lentils for a small tiffin service, offering fresh South Indian food like Idli and Dosa. Her vision, though contingent on her family's confidence and support, reveals that for some users, eCooking is not merely a labour-saving device but a potential **livelihood tool**. In the case of a woman who was orthopaedically impaired, this had begun to transform into a reality within the course of the study. It was observed that she had already begun to integrate the induction cooktop into her food-vending business, paving a potential route to ensuring the economic resilience of her household. In one case, the appliance reduced the physical burden on a chronically ill family member engaged in food vending, thereby supporting household livelihood continuity. This finding suggests that the value

proposition of eCooking extends beyond the domestic sphere into economic participation—an area warranting further exploration in future studies.

One orthopaedically impaired woman also ran a shop, living at the back of the premises with her family. It was found that as a result of the speed at which she could cook with her induction cooktop and rice cooker, more time was freed up for her to spend working at the shop and generating income.

Figure 42: "With this, I can knead dough. It gets done quickly. Kneading dough for many people has now become easier. I can help my sister-in-law with it. I enjoy doing it. I also cut vegetables, especially onions, tomatoes, potatoes, etc. Everything gets chopped very finely. It has become very useful for us." (Photo © Geeta Makwana)

The story of a couple who were both orthopaedically impaired brought to light the depth of potential for eCooking on the lives of PwDs: it revolutionised their domestic economy. Their story reveals how a feature as simple as a timer in an EPC can have significant impact on their livelihood as well as their daily routine as they juggle work and home life.

Nazera and Shabbir's Revolutionised Domestic Economy by Going Digital

In the narrow lanes of Vatva, time is the only currency that truly matters. For Nazera and Shabbir, the kitchen was once a tether, a place where the demands of an open flame dictated the pace of their working day. The arrival of an induction cooktop and an Electric Pressure Cooker did more than change their menu; it rewrote their domestic economy. By outsourcing the vigilance of cooking to a digital timer, the couple reclaimed the hours needed to sustain their home-based livelihood. Their story is an unsentimental look at how a simple "auto-off" switch can become a catalyst for financial resilience.

[Watch: A family's journey from manual labour to digital autonomy]

3.6 Supportive Cooking Technologies: Key to Including PwDs in eCooking

eCooking in households with people with disabilities often required the use of other electric devices beyond EPCs, induction cooktops and rice cookers to support the physical act of preparing food. This research gave PwDs the opportunity to have food processors and electric vegetable choppers to support them. PhotoVoice data revealed the benefits of these appliances for people with different disabilities:

Figure 43: "It takes less than a minute for the food processor to chop a large quantity of various vegetables into fine pieces. It's a super quick process to apply when there are guests at home." (Photo © Saraswatiben Marwadi)

Participants also reflected on the time saved by food processors. When one participant was asked what she would tell other people about it, she said,

> *"I'd tell them it saves so much time. For the Food Processor, I'd tell them you don't even have to get your hands dirty. You can put spices, oil, water, veggies, and flour all in at once. One turn of the knob and your dough is ready."* (Woman with orthopaedic impairment, interview)

The data revealed that whilst food processors had a significant positive impact on the cooking process, there were also challenges faced by PwDs. One woman's interview and another woman's PhotoVoice captures these mixed feelings, highlighting the hassle of set up and cleaning outside of the actual 'processing':

> *"It is so much faster. When I knead dough by hand, it takes time and pain. The processor does it in seconds, and the dough is much softer and better than what I produce manually. I even made Methi Thepla dough by putting the whole fenugreek leaves, oil, and spices in with the flour. It mixed perfectly in one go. Sometimes the dough comes out too soft, and I just fix it by hand rather than putting it back in the machine because cleaning the jar a second time is too much hassle. […] My Bhabhi from next door came over to see it. We've ground spices and made Phudina (mint) chutney in the small container. I also tried chopping cabbage, but it cut it too fine for a Sabzi—more like for a salad or Bhaji Pav. I've done onions too, which were fine. I haven't tried making juices yet; I want to be 100% confident with the basic functions before I "level up."* (Woman with orthopaedic disability, interview)

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Figure 44: "One of the hassles is fitting the bowl into the processor and then removing it after the usage from the processor. It takes so much time, doesn't come out easily." (Photo © Saraswatiben Marwadi)

The challenges of cleaning the food processor were clear from the data. The physical task of cleaning and packing it away seemingly offset the benefits of using it for speed of chopping ingredients. Participants highlighted how they used certain processes to clean it:

> *"I use a trick from the workshop that was given by [...] I add soapy water to the jar right after use and turn the knob on to clean it. If flour gets stuck in the lining, I just run the machine a bit longer and it pulls the dough together, leaving the jar clean. I do the final wash myself when I sit down for dishes."* (Woman with orthopaedic disability, interview)

Ultimately, whilst supportive technologies such as food processors and choppers were a 'helping hand' in the kitchen, challenges of physically handling them remained. Accessibility for PwDs in the set up and the packing away of appliances after use was found to be just as important as the ability to use them for making food itself.

4 Recommendations to Support the Inclusion of PwDs in eCooking

4.1.1 Existing Support Available for PwDs to Transition to eCooking in Gujarat

Whilst there is no specific scheme to expand eCooking access for PwDs, a review of policy at state level in Gujarat and at National level across India identifies that there are several existing schemes under which support can be provided to PwDs and their families to transition to eCooking. This section maps out these mechanisms and outlines how and

where support to access eCooking can be facilitated to households with PwDs through schemes available nationally and in Gujarat.

4.1.1.1 National level

There are three schemes available across India which can facilitate access to eCooking for households with PwDs:

- The **Assistance to Disabled Persons (ADIP) Scheme** (https://niepid.nic.in/adip/) is intended to provide PwDs in India with modern, sophisticated and durable assistive devices. These devices are aimed to help PwDs live more independently, reduce impact of impairment on them and prevent any further complications. A standard list for support includes mobility aids, however the **"Modern/Sophisticated Aids"** provision category allows for high-tech devices – including eCooking technologies- to promote independence for PwDs. A 100% subsidy is available for those with a monthly income of up to ₹22,500 INR.
- The **National Handicapped Finance and Development Corporation/ National Divyangjan Finance and Development Corporation (NHFDC)** (https://depwd.gov.in/en/national-handicapped-finance-and-development-corporation/) aims to provide concessional loans for self-employment for PwDs, with 4-8% interest. Through this support, PwDs can be supported to start their own home-based catering or food businesses by being able to procure commercial grade eCooking equipment. Two schemes are available through the NHFDC which PwDs and their families can utilise as a way to untap the potential of eCooking as a source of income:
    - **Divyangjan Swavalamban Yojana**: Financial assistance in the form of a loan for PwDs to start any activities that contribute directly or indirectly to income generation, facilitating their overall empowerment.
    - **Vishesh Microfinance Yojana:** Prompt and needs-based finance is provided at a reasonable rate of interest through NBFC-MFI, Section-8-MFI, and NGO-MFI, SHG Federations, State Government Missions, and other state-level organisations to pursue small/micro business and development activities.
- The **Samarth Scheme** (https://nationaltrust.nic.in/samarth-scheme/) through **The National Trust** aims to provide care and relief for people living with Autism, cerebral palsy and multiple disabilities. The scheme focuses on setting up Group Homes, within which eCooking equipment as part of accessible kitchen infrastructure is a funded component.

4.1.1.2 State level - Gujarat

In Gujarat, access to eCooking for PwDs can be facilitated through two state-level schemes:

- The **Divyang Sadhan Sahay Yojana (Gujarat Social Defence)** (https://sje.gujarat.gov.in/dsd/scheme/sahana-sahay-yojana?lang=english) provides tools for PwDs worth up to **₹20,000**. PwDs who declare an intention to run a small food-related business can apply for induction cooktops under the "Self-Employment Kits" category.
- **Sant Surdas Yojana** (https://www.myscheme.gov.in/schemes/sss-gujarat) provides PwDs financial assistance through a pension of **₹20,000** a month, which can be used to support PwDs to pay for electricity bills that are incurred by eCooking.

4.1.2 Recommendations for Policy and Practice

To facilitate inclusive eCooking which can enhance the cooking experience, wellbeing and economic opportunities of PwDs, and to inform policy, standards and market mechanisms that ensure no one is left behind in the clean cooking transition, the following recommendations have emerged from the study. Panel discussions at the collective stakeholder workshop held in February 2025 built on feedback from PwDs and caregivers to identify key policy and practice recommendations for including PwDs in the transition to eCooking. The panel discussion, chaired by Neeta Panchal (Disability Expert), comprised manufacturers of customized appliances for persons with disabilities, representatives from academia, healthcare professionals, clean energy advocates, disability rights activists, civil society leaders, an urban planner, and study participants, including a caregiver. Members of the panel outlined that there are four pillars that recommendations for including PwDs in eCooking need to work around: **affordability, accessibility, availability, and awareness.** The next sections take the various recommendations in turn, discussing them in terms of their implications for policy and practice.

Figure 45: Panel discussions at collective stakeholder workshop (Photo © Prabhat Education Foundation)

4.1.2.1 Universal eCooking technology design and manufacturing

Universal design which includes everyone – with and without disabilities – needs to be applied for an inclusive transition to eCooking. Accessibility may be discussed in the context of disability, yet it needs to be recognised that it includes everyone. A notable recommendation came from the survey with PwDs and caregivers: **appliance buttons should be labelled in Gujarati, Hindi and other languages** to make them universally accessible in different contexts, for people to maximise their use. **Localised interfaces should be a standard practice.**

Households with PwDs also raised the need for **audio cues** and **braille labelling** on eCooking appliance buttons, so that those who are hearing and/or visually impaired can tell functions apart easily. The panel suggested that **voice automation** should be a feature to consider alongside **tactile interfaces** for appliances such as EPCs, rice cookers and induction cooktops. **Talking features** which speak the functions as buttons are pressed would help those who are visually impaired to select the functions that they would like to use.

eCooking technologies need to be **designed for psychological safety.** Appliances should include features that invite exploration without fear of "breaking" them—such as exploratory modes, clear error recovery, or audible reassurance that operational sounds are normal.

Appliance design needs to **address the full workflow, not just the cooking event.** Design must consider storage, transport, and setup. Lighter materials, integrated cord storage, and placement solutions can reduce "transit dependency."

To facilitate the integration of these accessible features, engagement with relevant stakeholders is needed. Most notably, **eCooking appliance designers and manufacturers should employ** PwDs, to ensure inclusive features are embedded from the start. Collaboration is needed with **product experts in the field of universal design, to include PwDs in eCooking.**

4.1.2.2 Health and ergonomic considerations

Programmes to include PWDs in eCooking need to assess the impact of standing or sitting for a long time on health, and **assess the role that ergonomics has in supporting PwDs in eCooking**. Factors such as arthritis, the height of platforms and the need for regular breaks during cooking every 15 minutes should be taken into account.

4.1.2.3 Collection of data on energy access, cooking, and disability

To implement standards on disability and electricity, **different actors need to come together and organise to collect data**. Civil society actors need to be engaged with government in an appropriate way to ensure that the sources of data collection come through. A system is needed to collect data at a large scale and build a picture around energy access, cooking, and disability. Data needs to be pulled together from the different sources from where it is being collected, to build an advocacy movement and enact policy change. Considerations should be made regarding what needs to be done, and who will be impacted as a result. A common database system where all the data comes together is needed for larger policy impact.

In the upcoming census, as data on disability is being gathered, **questions need to be asked on whether the accessibility of and availability of kitchens will be captured**. Movements are needed to insist on it being captured to get the data. Data should be gathered to illustrate the picture on who has kitchens, how accessible they are, and whether they are in a separate space. Low-income households which only have one space and are more vulnerable to wider hazards such as heavy rainfall and flooding, still need the electricity, and the systems need to be waterproof to use safely.

Data matters for eCooking for PwDs to gather pace. As the panel reflected, until someone shares the information, no one will pay attention to the issue. An opportunity to collect this data lies in **the upcoming Census**, in which **enumerators need to be trained to ask the question about disability**, to collect disaggregated data on disability and clean energy access, to expand access to eCooking for PwDs by understanding energy access in the kitchen for PwDS through mechanisms such as the National Family Health Survey (NFHS) and National Service Scheme (NSS). There is a need to use routes such as data on eCooking and disability to shape data on disability more widely, and address discrepancies that are often present.

Data should be used to facilitate **dialogue with eCooking appliance manufacturers**, presenting details on inclusive design features needed.

4.1.2.4 Government policy and programme support for PwDs to access eCooking technologies

India's Unique Disability ID (UDID) (https://swavlambancard.gov.in/) portal for PwDs should be used as **a platform for raising awareness and facilitating support to access inclusive eCooking technologies**. Inclusive eCooking solutions should be visible along with the supportive devices listed for daily living. If households with PwDs can see them, they can make informed decisions about what is best for them including the schemes that can make it possible for them to access them.

National level schemes to expand access to eCooking, such as those by Energy Efficiency Services Limited (EESL) should be tapped into for **households with people with disabilities**. The panel highlighted the fact that there is work being done to scale up bulk buying in policy circles, examining costs and increasing warranties to up to two years, which should be expanded to consider those with disabilities across India.

The panel reflected on the fact that the Sugamya Bharat Abhiyan (Accessible India Campaign) (https://depwd.gov.in/en/accessible-india-campaign/) has not mobilised much towards achieving its promise of accessible government buildings. The new **supreme court ruling on the right of PwDs to digital accessibility should include eCooking** devices. Existing **capacity building and training programmes** for education, skill building and livelihoods **targeted towards PwDs need to have a component on eCooking**. These programmes need to involve people from different sectors to break the silos, and connect to people with different disabilities, for the transition to eCooking to be truly inclusive. Capacity building programmes should be supported with accessible manuals for eCooking appliances, including in Braille and in local languages.

Experience centres for PwDs to test eCooking products at places such as disabled peoples' organisations or Composite Regional Centres should be set up. These centres can act as places to create awareness about what is available for PwDs, facilitating the expansion of access to eCooking.

Donors involved in eCooking expansion need to work to reach the last mile. Training and capacity building is key to this, yet it is essential that there are **follow-ups after the training is done**. Engagement of PwDs and caregivers outside of the study requires the involvement of those who have participated in this research for further reach. Including PwDs in eCooking cannot only lead to their independence, but also to their visibility if they are involved in teaching other people and inspire others to use eCooking devices, either in person or through online videos. These programmes should **include all types of PwDs** including those with intellectual disabilities, with appropriate accessible teaching and learning techniques.

Support caregivers as both users and facilitators. Training and materials should acknowledge the caregiver's dual role, offering separate guidance for managing one's own fears while enabling another's independence.

Peer demonstration through channels such as social media should be used to build confidence. Social proof and community validation are powerful tools for moving users along the Trust Spectrum. For eCooking technologies to be truly inclusive, they must not only cook well but *fit* seamlessly into the homes, languages, bodies, and emotional lives of the people who use them. The appliance must earn the user's trust at every step—from the moment it is carried into the kitchen to the moment the final dish is served.

Capacity building programmes also need to be targeted towards the eCooking sector as part of **awareness-raising**; to give **manufacturers the knowledge needed to design and include accessible features.**

4.1.2.5 Financial mechanisms and economic empowerment

Pathways to support the **economic empowerment of PwDs through eCooking** need to be created. Action is needed to look further into how eCooking can be utilised to support income generation, such as through **street vending**. eCooking can facilitate PwDs to cook in larger quantities and consider selling the food as income generation. Further exploration is needed with regards to how eCooking could be used to mobilise income generation in groups for PwDs.

Sensitivity to the income levels of households with PwDs is however required, as high-end, **expensive eCooking devices are not always the appropriate answer** in low income households where money matters.

PwDs in the research also relayed the importance of **government attention to eCooking and disability.** Efforts are needed to **investigate subsidising eCooking devices** to reach poorer households with PwDs and reduce the use and dependence on gas for cooking. As awareness and demand for eCooking appliances increases, a **market should be created, and the costs of appliances should reduce** for PwDs. Organisations such as the Composite Regional Centres should be engaged and made aware of eCooking products so that more PwDs can be reached. Overall, the affordability of eCooking devices should be addressed through mass production.

4.1.2.6 Awareness and consideration of cultural factors

Acceptance of eCooking devices needs to be considered where families can be more rigid about which technology gets used. *Garima,* or dignity, needs to be at the core of eCooking programming. eCooking should be treated as a mechanism for PwDs to cook what they want to, how they want to cook and when they want to, with devices to be seen as **tools of convenience**, especially for those with limited mobility. Societal attitudes around gender are also crucial considerations. Integrating PwDs in the transition to eCooking requires revisiting cultural notions that only women and girls can cook, and active **involvement of men and boys** from the outset of implementing programmes.

4.1.2.7 Advocacy and awareness-raising through inter-sectoral approaches

Expanding access to eCooking for PwDs and their caregivers requires **advocacy and awareness raising**. As a start, routes such as televised **cooking competitions** such as Masterchef should be used as platforms for promoting the inclusion of PwDs in eCooking, by enabling them to showcase their recipes using various eCooking appliance through media to large audiences.

The role of academia in expanding access to eCooking for PwDs needs to be considered as part of advocacy efforts. From an academic perspective, technical **disciplines like urban planning and engineering need to be sensitised** to build their interest if all of these solutions are to be seen on the ground. The gap between academia and practice needs to be bridged for solutions to be implemented.

Disability needs to be seen as a **cross-cutting issue for climate change, gender, and housing**. Civil society organisations and academics need to come together and break the silos to **develop the synergy and ecosystem for the solutions to be implemented through advocacy and sensitise through networks** to advocate for this as part of the 'right to life with dignity' as per the Supreme Court of India ruling on digital accessibility. Actors from different sectors need to come together to bring the findings of the study to the attention of government, and with the support of leading academic institutions in the field of design in India, **convey a message to policymakers that accessibility in eCooking is non-negotiable.**

4.1.2.8 Integration of eCooking and disability into urban planning

From a planning perspective, the **kitchen should be considered as a critical part of access to housing**, within the broader framework of the extent of access to housing at large and levels of homelessness within India. For instance, slums may have kitchens in the house, but access to electricity is often shared between a few households and accessed informally. In these conditions, safety and regularity of use need to be considered in scale up due to irregularity of supply.

The **kitchen should be recognised as part of a larger ecosystem**. Whilst cooking happens in the private domain of the home, accessibility is still critical, and the accessibility standards that get set for the kitchen influences the National Building Code. The National Building Code should be reviewed and revised to consider safety and accessibility in kitchens and what should be present to ensure these in housing and in public buildings, to facilitate access to eCooking for PwDs. Flexibility in the application of these standards is needed for local governments to implement, considering geographical differences between states such as topography and the impact this has on housing. Sensitisation on these standards is key, and the process of sensitisation should involve academic institutions involved in planning and design. Experts reflected on the fact that accessibility in kitchens can only become a compulsion when it is supported. At present, the National Building Code of India does not talk about kitchens, and it should be

amended to include kitchens, so that PwDs can be included in their design, and that they can use eCooking appliances with ease.

Urban planning needs to be seen as a critical instrument to catalyse the inclusion of PwDs in the eCooking transition. Before the accessibility of eCooking technology is considered – **the accessibility of electricity needs to come first**. Alongside electricity sources from the main grid, considerations should also be made about the potential of solar energy in eCooking, for which households with PwDs would require batteries and potentially converters. Panellists noted that issues with the scale up of access to energy remain in the North East of India in states such as Chhattisgarh and Madhya Pradesh, hence access to electricity for households with PwDs needs to be a primary consideration before access to eCooking can be expanded.

Integrating eCooking and disability into urban planning requires a review of existing guidelines by the Bureau of Indian Standards (BIS) for electricity. Considerations should be given as to whether specific standards are needed in relation to disability and electricity, and a separate set should be made accordingly.

5 Key Findings

This study has delved deep into the under explored possibilities- and challenges to be addressed- of including PwDs and their caregivers in the transition to eCooking in India. Existing state level and national schemes to support the physical 'access' to eCooking are available if households with PwDs are made aware of them, yet this research has shown that it is not enough just to raise awareness and facilitate supply.

The findings of this study are multilayered, and inherently shaped by the socio-cultural contexts in which people with disabilities and their families live. These key findings stem from the data that was collected with PwDs and caregivers through interviews, cooking diaries, surveys, PhotoVoice, drawings and field observations, and from the three workshops that were held as part of the study.

Collaborative research and peer learning approaches through inclusive co-learning platforms are key to including PwDs in eCooking. By using a participatory and collaborative model through dedicated workshops and social media messaging apps, participants could share experiences and gain peer support through cross-disability interactions, giving strengthened community social capital. Collaborative, inclusive approaches can be used to create accessible audio, tele and video cooking diaries for PwDs and caregivers.

Accessible household kitchen infrastructure is a prerequisite to inclusion. Kitchens need to be modified for PwDs to use eCooking appliances, using measures such as lower plug points and switchboards, customised storage units and accessible platforms. Limited

square footage in the home can force PwDs to relocate eCooking equipment after each use, which can necessitate assistance from others.

Technical support and maintenance infrastructure are required for long-term sustainability for eCooking and disability programmes. As local repair facilities for specialised eCooking devices are often unavailable, providing timely guidance and establishing a reliable maintenance system is key to ensuring the success of disability-inclusive eCooking programmes.

Transitions to eCooking are diverse and non-linear, shaped intrinsically by psychosocial factors. PwDs and caregivers' journeys were highly influenced by psychosocial factors, and there was significant variation between participants. Whilst some participants mastered both use and maintenance of eCooking appliances, some restricted themselves to only using certain functions, and others remained fearful from the start until the end. Adoption was most robust where: functional necessity aligned with perceived safety, family dynamics were enabling or strategically engaged, psychological fears were directly addressed, and where time savings could be meaningfully redistributed. Supportive ecosystems from family members, are central to sustained technology adoption . eCooking transitions had significant psychosocial impacts on participants, who were also affected by wider psychosocial factors, such as gender and the supportive role of men and boys, senses of safety and fear, confidence in being able to learn to new technologies and caregiving roles. A sense of agency, independence, confidence, empowerment and enjoyment was clear, but this was not immediate, uniform nor universal. eCooking devices can act as a catalyst for confidence, but this is dependent on trust from external actors as well as trust in the appliances from PwDs and caregivers. Independence is shaped by: a sense of safety; confidence in PwDs and psychological reassurance from others; functional demand and necessity; removal of fear from open flames and LPG gas; reclaiming time and reducing drudgery and physical strain; intrinsic motivation; and a sense of happiness and satisfaction. The benefits of the portability and 'smart' features of eCooking appliances can be offset by a 'transit dependency' and the 'physical friction' of the need to set up and put away the appliances, which is challenging in the context of limited space to keep them in, and a dependency for PwDs on family members to prepare cooking spaces, leading to LPG use and slippage in the eCooking transition. eCooking can bring a sense of 'modernity' through digital confidence to PwDs, with appliances holding a deep symbolic meaning at household level. Gender remains a critical factor in shaping eCooking experiences. Women with disabilities remain overwhelmingly responsible for cooking, even after the introduction of eCooking technologies, but the role of men and boys was significant. Household hierarchy and restrictions impact PwDs' ability to engage in eCooking. eCooking provides caregivers and PwDs moments of relief and rest through time-saving. Taken together, the findings suggest that eCooking technology functions not merely as an efficiency enhancing appliance, but as a socio-technical intervention that intersects with gender norms, disability, caregiving labour, household hierarchy, and identity formation.

Universal design of eCooking appliances is critical to including PwDs. eCooking appliances were valued for being portable and lightweight, and enabled PwDs to sit whilst cooking, but that several features needed to be added for accessibility. These included:

- Audible alerts to tell people when food is ready such as buzzers
- Audio descriptions, talking features and voice prompts for functions
- Tactile markers and Braille and local language labelling on buttons
- Non-slip bases
- Promoting the use of existing features such as timers
- Simplified toggle buttons

EPCs bring advantages because they have multiple features for ease of use, are a 'one pot' cooking system that reduces physical strain, enable PwDs to sit down and cook, have robust safety features, reduce the risks of burning hands, are easy to maintain, and can let PwDs and caregivers leave food to cook with a timer. EPC design however can be improved through:

- Integrating audible alerts
- Improving lids through making them lighter and adding silicone grips and latch mechanisms that require minimal force
- Reviewing the number of buttons to reduce confusion
- Improving the interface of the EPC to make it more accessible

Rice cookers are beneficial due to their safety features, simple operation, 'keep warm' function and reduced physical effort, and their deep pots which stop food from boiling over. The accessibility of rice cookers can be improved by ensuring the integration of appropriate buttons for functions and audio alerts. Use of induction cooktops by is shaped heavily by design. Beeps for existing induction controls are confusing for those with visual impairments, which is compounded by the absence of Braille marker. Audio cues and vibrations are important in induction cooking design. eCooking appliances can be make more accessible by focusing on appliance weight, cord length, storage solutions, interface language in either Braille or local language, as well as the use of pictorial representations. Design must consider storage, transport, and setup.

Table 5 outlines the overall pros and cons of the eCooking appliances as identified through the data.

Appliance	Pros	Cons
Induction Cooker	**Safety** - No risk of flame, which particularly benefits those with visual impairments - The surface doesn't get very hot, only the utensil heats up - Automatically turns off if no vessel is detected - Shuts off during overheating or spills	- Requires induction-compatible utensils - Needs electricity (power cuts can affect usage) - The audible cues (beep sound) are the same for every option, which makes it confusing for people with visual impairment.
	Operation - Preset modes and timer option reduce need for constant monitoring - Audible beep sounds, lets the user know that the machine has been turned on, which particularly benefits those who are visually impaired.	
	Less Physical Strain - Heats up faster than conventional gas stoves - Reduces time standing in the kitchen, particularly for people with orthopaedic disabilities	
	Cooler kitchen environment - Heat goes directly into the pan, not the air - Kitchen remains cooler and more comfortable, especially needed for hot climatic conditions in contexts such as Ahmedabad	
	Maintenance - Easy to clean - Spills do not burn onto the surface because it stays relatively cool	

	No Dependence on LPG Handling - No heavy cylinders to lift or replace - No risk of gas leakage	
Rice Cooker	**Safety** - No open flame - Automatic shut-off prevents overheating - Reduced risk of burning or forgetting food	- Needs electricity (power cuts can affect usage) - Takes counter/storage space - Limited cooking flexibility, mostly suited for rice, curries and simple dishes
	Operation - Simple functioning with just one button, which has a click sound at being pressed, which provides the indication that the food is being prepared.	
	Reduces physical effort - No constant checking or stirring - Frees up time and energy for other tasks - Automatically adjusts temperature, which makes the rice cook perfectly	
	Keep-warm function, keeps food ready without reheating	
	Multi-function cooking – can cook dal, steam vegetables	
	Maintenance Easy cleaning by removing the inner pot and lightly washing it.	

<table>
<tr><td>Electric Pressure Cooker</td><td>Operation
Fast cooking, with pre-set options.
Multi-function appliance. Can pressure cook, steam, sauté, slow cook, etc
Better food quality with less effort
Retains nutrients and flavour due to faster cooking
Food stays warm for longer
Less physical strain
Automatic pressure and temperature control, which helps to avoid constant monitoring.
Less physical strain. Constant stirring not required.
Safety
Advanced built-in safety features, like lid lock (won’t open under pressure), auto shut-off, pressure/temperature sensors
No open flame
Maintenance
Easy removal of the inner pot, the only part which requires washing.</td><td>Opening incorrectly can release hot steam forcefully.
Heavier and harder to handle. Inner pot and lid are bulky and heavy.
Interface complexity. Multiple modes, buttons, timers. Can be confusing or overwhelming.
Cannot be used during power cuts.
Requires correct setup at every usage, especially the inner rubber lining.
No separate audio for different options, just a single beep, which can make it confusing for a visually impaired person.
Limited pre-set options, especially for non-vegetarians.</td></tr>
<tr><td>Roti Maker</td><td colspan="2">Tested by one participant with an orthopaedic disability and returned after 20 days. Rotis did not cook evenly, and often left undercooked or too hard although the dough was shaped. Difficulties identified with needing to keep the handle pressed for a long time.</td></tr>
</table>

Table 5: Pros and cons of eCooking appliances for PwDs and caregivers

Supportive cooking technologies are key to including PwDs in eCooking. Food preparation can be supported through vegetable choppers and food processors.

6 A Call to Action: Integrate Disability in eCooking through Intersectoral Approaches

Disability has had a certain degree of attention in assessing accessibility in standard cooking technologies, yet despite many innovations, challenges still remain in including PwDs in contexts such as India in cooking technology design. The transition to eCooking should be seen as an opportunity to redress this long-standing issue. Applying the principles of universal design to technologies such as EPCs, rice cookers and inductions is a start. Yet, inclusive eCooking needs to be embedded into the very fabric of homes, with urban planning leading the way to ensure that we are not only ready to give accessible eCooking appliances with features including braille buttons, talking functions and more a rightful place in the kitchen, but that we also have the guidelines, data, manufacturing support, financial resources, and access to additional supportive technology and human resources to do so. To achieve inclusive eCooking, let's facilitate the active participation of PwDs and caregivers at the heart of programming, so that we leave no one behind, and include every 'body'.

Appendices

Appendix A Participant information sheet

Research project: Inclusive e-Cooking for people with disabilities in Ahmedabad

Participant information sheet for people with disabilities and caregivers

Research team: Prabhat Education Foundation (Ahmedabad), Dr. Amita Bhakta (Independent consultant, UK)

What is the purpose of the study?

This research is being conducted to understand how electric cooking (e-Cooking) technologies can impact the cooking experiences of people with disabilities and their caregivers in the Ahmedabad area. We are working with people with disabilities and caregivers to trial cooking appliances which use electricity, to understand how well they can use these technologies, any changes that they would like to see to the design of these technologies, any changes needed in your kitchen to be able to use these technologies, and any further support you may require to use them well.

Who is doing this research and why?

This research is being done by Prabhat Education Foundation and Dr. Amita Bhakta, who is an independent consultant from the UK. This research is being conducted for the Modern Energy Cooking Services programme at Loughborough University, UK.

Who can take part in the research?

You have been invited to participate in this research because you have been recognised as an adult with a disability who can provide valuable insights into this study on energy access.

Any person can take part in the research who:

- Has or is caring for a person with a physical or intellectual disability
- Is aged over 18 years
- Is living in the Ahmedabad area of Gujarat
- Cooks meals at home
- Has a household electricity connection to the main grid
- Is willing to trial electric cooking technologies as part of daily cooking routines
- Is able to communicate, either verbally or through sign language, in Gujarati and/or Hindi and/or English
- Is able to write in either Gujarati, Hindi, or English, or is able to use stickers or Bindis to record feelings about using electric cooking technologies in a simple chart
- Is able to hold a crayon and draw
- Is able to hold and use, or direct another person to use, a 'point and shoot' digital camera to take a picture and/or create videos

What will I be asked to do?

As part of the research you will be asked to take part in one or more activities so that we can understand your experiences of using electric cooking technologies. We may ask you to:

- Attend a workshop with Prabhat Education Foundation to choose some electric cooking technologies you wish to trial at home, and to have your say on how the study will be conducted
- Draw some pictures of your kitchen as part of this workshop and how it can be adapted for you to use electric cooking technologies
- Have your kitchen adapted slightly to accommodate electric cooking technologies
- Test and use some electric cooking technologies as part of your daily cooking routine for up to 45 days
- Keep a record of how you are feeling about using these technologies through a Bindi chart, written diaries, or through video diaries
- Meet with members of the team who will come and visit you at home to see how you are doing as you use the technologies, and see if there are ways they can help you to use the technologies if you are finding it difficult
- Take part in an interview with members of the team, which may be by audio or video
- Take part in a survey
- Draw some pictures of how you feel about using these technologies and tell us about your drawings
- Take some photos, or ask us to take some photos, which show us how you use the cooking technologies, and how it makes you feel. You will then be asked to explain to us what each of the photos is showing
- Attend a workshop with the team at Prabhat and Dr. Amita Bhakta to share the findings of the research with people who work for the local government, local universities in Ahmedabad, and other academic institutions.

What benefits do I get in participating?

In exchange for taking part in this research, we will give you some utility products customised to your needs to keep as a gift. If you take part in the photo exercise, we will give you a copy of the printed photos to keep. We will provide you with refreshments at each workshop or meeting you come to.

Will my relationship with Prabhat Education Foundation be affected by my participating or not participating?

No, your relationship with Prabhat Education Foundation will not be affected whether you decide to participate or not participate.

Do I have to take part?

No. It is up to you to decide to take part or not. If you don't want to take part, that's ok. This will not affect any future support you receive. If there are any photos or drawings that you don't want us to use, you don't need to explain why and we won't use them.

Once I take part in the research, can I change my mind?

Yes! After you have understood the information on this sheet, we will ask for your verbal consent to take part. However if before, during or after the sessions you wish to withdraw from the study please just contact Amita Bhakta or Prabhat Education Foundation. You can withdraw within a time period of up to 14 days after you finish testing the cooking technologies for any reason and you will not be asked to explain your reasons for withdrawing. You just need to tell the team that you don't want to be in the study anymore. You can stop at any time. You can carry on after a break, or you can withdraw from the study. Our notes and recordings from our discussions will be destroyed. This will not affect any future support that you receive.

Are there any risks in participating?

There is a risk that you may feel uncomfortable or distressed when discussing certain issues, or that you may get tired whilst trying the products or when meeting us. If you do so, please tell us immediately and you can stop being involved. You can ask us to stop at any time. If you feel tired at any point in the data collection process, please tell us and we will stop.

Will my taking part in this study be kept confidential?

Your participation in this study will be kept confidential. If you take part in PhotoVoice, video diaries, and drawings, we will give you the option of using your name to attribute photos, videos or screenshots from videos and drawings, or to come up with a different name. Otherwise, your identity will be made anonymous and in the research reports you will be given a different name. All of your data will be stored safely on a password protected computer. This data will be destroyed after two years.

I have more questions, who should I contact?

If you have any further questions, please contact Prabhat Education Foundation.

What will happen to the results of the study?

The results of the study will be used to write blogs, create exhibitions, produce videos for social media, and write reports.

Appendix B Overall Study Consent Form

Overall study consent form for people with disabilities and caregivers

Instructions for fieldworkers:

1. *Ask the individual if they remember the purpose of the study and why they have been asked to participate. If they need refreshing, refer to the 'Participant Information Sheet'. Remind the individual that their participation is voluntary.*
2. *Remind the individual that they have a right to withdraw at any time*

Please tick and sign or thumbprint as appropriate:

I, (insert name) _____ have read or have had the participant information sheet read to me and consent to the following:

	✓ As appropriate
Participating in this study on 'Inclusive e-Cooking for people with disabilities in Ahmedabad'	
Attending a workshop to choose electric cooking technologies I would like to try and to design two other workshops	
Having my kitchen adapted so that I am able to use electric cooking technologies	
Testing electric cooking technologies for up to 45 days as part of my daily cooking routine	
Being observed at home by the research team whilst I use the electric cooking technologies	
Participating in an interview	
Having words that I say included in a report or other publications included with a different name to mine	
Participating in a PhotoVoice activity where we take photos	
Participating in a drawing activity as part of a workshop	
Retaining the ownership of any photos and drawings I create, in my name or an alternative name that I suggest	
Having my photos and drawings featured in publications	
Participating in a survey	
Producing videos or audio recordings about my experiences of e-Cooking for social media	
Participating in a workshop where we will share the findings of the research with people who work for the local government, local universities in Ahmedabad, and other academic institutions.	
Having my data stored by the research team for two years on a secure drive and password protected computers	

Name: _____

Sign/thumbprint: _____

Date: _____

Appendix C PhotoVoice Consent Form

Consent form for PhotoVoice: People with Disabilities and Caregivers

You have taken photos of your experiences of using e-Cooking technologies as a person with a disability or as somebody who cares for a person with a disability. We have printed these photos. Today we will look at these photos together. I will ask you some questions about why you took these photos. We will then look at all the photos together, and you will put them in order of what you feel represents the most to least important issue you have photographed.

You will be shown all the photos taken and can keep copies of the photos you take. If there are any photos that you don't want us to use, you don't need to explain why and we won't use them. This will not affect your relationship with Prabhat or any future support that you might get.

You will own the copyright on the digital images. This means you have the right to say how they will be used. It also means that when they are used, you will always be acknowledged as the photographer. Remember, this means that people will know you took the photos and what you tell me about them. If you do not want people to be able to identify you, we can put a fake name next to your photos and words.

What are the possible benefits?

You will get copies of the photos you have taken. We cannot promise that the study will help you, but the information we get from the study will help our knowledge and understanding of the issues.

Instructions for fieldworkers:

1. *Ensure the participant understands what it means to have their face blurred or not in a photo, show the participant a photo of a person without their face blurred and the same photo of the person with their face blurred.*
2. *When you ask for consent to put the participant's photos in blogs and publications, explain that this means that people they have never met in India and worldwide can see their photo and the caption. Ask them if they would be comfortable if someone who may or may not know the participant saw the photo. If they are not, they might not want their photos used online, in exhibitions or in publications.*
3. *When you ask the participant if they want their real name credited to the photos, make sure they understand this means they can be identified.*

Remind the participant that we will not share photos that depict their face without their consent.

I (insert name) _____ understand that I retain copyright of my photographs but give permission for Prabhat Education Foundation and Amita Bhakta to retain copies of the images for use as consented to in the list below:

CONSENT CHECKLIST

I am happy for Prabhat Education Foundation and Amita Bhakta to use my photographs in the following ways:	**YES** ☑	**NO** ☒
With my face blurred		
Without my face blurred		
As part of this study report		
In publications related to this study		
At public exhibitions related to this study		
On Loughborough University's MECS website		
On Amita Bhakta's website		
On the Prabhat website		
In media about this study.		

Do you want these photographs to be credited with your real name? **YES / NO**

If no, please specify an alternative name to be used.....

PLEASE FILL IN YOUR FULL CONTACT DETAILS BELOW:

Photographer's full name:

Photographer's Address:

Mobile:

Signed:

Name Date Signature/Thumbprint

Appendix D Door to Door Survey

Visit 1:

Door-to-Door Visit Questionnaire

(For Participant / Caregiver)

VISIT 1: INITIAL ORIENTATION AND FAMILIARISATION

- Participant ID: _____
- Date of Visit: _____
- Name of Data Collector & type of Disability: _____
- Visit Number: ☐ 1st ☐ 2nd ☐ 3rd
- Appliance being reviewed: _____

Sec A. Background and Familiarity with Technology

1. Have you ever used any kind of electric cooking appliance before?

☐ Yes, regularly ☐ Occasionally ☐ Have seen others use it ☐ Have helped someone else use it ☐ No, have not used it at all

If yes, please specify which one? (Mixer/Grinder, Rice Cooker etc) _____ _____

2. Who usually cooks in your household?
   ☐ Self ☐ Caregiver ☐ Family member ☐ Shared responsibility

3. Who is using the appliance?

☐ Participant ☐ Caregiver ☐ Both together ☐ Both individually ☐ Other Family members: If yes, who? _____

Sec B. Emotional response and first thoughts

4. How did you feel when you received the new appliance for the first time?

☐ Excited / Happy ☐ Curious to learn ☐ Nervous / Unsure
☐ Afraid of breaking or damaging it ☐ Didn't believe it would be useful ☐ Other (specify): _____

5. How did your family react when they heard you would receive an appliance?

☐ Very supportive and happy ☐ Curious but unsure ☐ Worried about electricity or safety
☐ Not interested / didn't think it would help ☐ Other (specify): _____

6. When the appliance arrived, how did your family members behave?

☐ Helped me explore it ☐ Asked questions / watched me use it ☐ Took over and started using it
☐ Didn't show much interest ☐ Other (specify): _____

Sec C. Assembly and Setup

1. How much time does it take to assemble or set up your appliance before you can use it?

☐ Less than 2 minutes ☐ 3–5 minutes ☐ 6–10 minutes ☐ More than 10 minutes ☐ Cannot do it alone

2. Do you need help from a caregiver/family member when using the appliance?
   ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
   If yes, who assists you and how? _____

3. How easy or difficult is it for you to operate the appliance on its own?
   ☐ Very easy ☐ Somewhat easy ☐ Difficult ☐ Cannot use without help

Sec D. Early Use, Initial Thoughts

1. How often have you used the appliance?
   ☐ Every day ☐ Few times a week ☐ Rarely ☐ Not at all

   If not at all, then why? _____

2. What types of dishes have you cooked using the appliance?
   ☐ Rice/grains
   ☐ Vegetables/curries
   ☐ Tea/Beverages
   ☐ Snacks
   ☐ Roti/Bread
   ☐ Other (please specify): _____
3. Have you experienced any safety issues while using the appliance?
   ☐ Yes ☐ No
   If yes, please describe: _____
4. Did you face any problems with electricity supply while cooking?
   ☐ Yes, often ☐ Sometimes ☐ Rarely ☐ Never
5. Are all buttons, switches, or controls easily reachable for you?
   ☐ Yes ☐ Somewhat ☐ No
6. Are there any parts of the appliance that are difficult for you to see, touch, or handle?
   ☐ Yes ☐ No
   If yes, which ones? _____

7. Do you have to make any further adaptation to make the use easier? (e.g. stool, alternate tools, etc.)
   ☐ Yes ☐ No

If yes, please describe: _____

Observation Checklist (for Data Collector)

(To be filled quietly while observing and after interaction)

Kitchen/Environment:

Adequate lighting near appliance? ☐ Yes ☐ No
Adequate ventilation near appliance? ☐ Yes ☐ No
Sufficient space to place/use appliance safely? ☐ Yes ☐ No
Accessibility (within reach of participant)? ☐ Good ☐ Moderate ☐ Poor

Participant Ergonomics:

How does the participant approach the appliance? ☐ Independently ☐ With assistance
Comfortable posture while cooking? ☐ Yes ☐ No
Requires physical support/adaptation? ☐ Yes ☐ No

Family/Caregiver Dynamics:

Caregiver involvement observed? ☐ Active ☐ Occasional ☐ Minimal ☐ None
Does the caregiver appear confident in the participant's ability? ☐ Yes ☐ No
Any restrictions/barriers imposed by family? Notes: _____

Safety Indicators:

Do you see any unsafe wiring, open sockets, or exposed surfaces?
☐ Yes ☐ No
Signs of fear, hesitation, or physical discomfort while using appliance?
☐ Yes ☐ No

Appliance Condition:

Clean and well-maintained? ☐ Yes ☐ No
Signs of wear/damage? Notes: _____

Diary Review:

Entries complete since last visit? ☐ Yes ☐ No

Clarifications needed? Notes: _____

Other Notes (qualitative):

Visit 2

Door-to-Door Visit Questionnaire

(For Participant / Caregiver)

VISIT 2: USABILITY, ADAPTATION AND OVERALL IMPACT

Sec A. Usage Patterns

1. Since our last visit, how often have you used the appliance?
   ☐ Every day ☐ Few times a week ☐ Rarely ☐ Not at all

   If not at all, then why? _____

2. What types of dishes have you cooked using the appliance?
   ☐ Rice/grains
   ☐ Vegetables/curries
   ☐ Tea/Beverages
   ☐ Snacks
   ☐ Roti/Bread
   ☐ Other (please specify): _____

3. How much time does it take to assemble or set up your appliance before you can use it?
   ☐ Less than 2 minutes ☐ 3–5 minutes ☐ 6–10 minutes ☐ More than 10 minutes ☐ Cannot do it alone

4. Compared to your previous cooking method, how do you find this appliance?
   ☐ Much easier ☐ A little easier ☐ Same ☐ More difficult ☐ Can't say

5. Do you still need help from a caregiver/family member when using the appliance?
   ☐ Always ☐ Sometimes ☐ Rarely ☐ Never
6. How easy or difficult is it for you to operate the appliance on its own?
   ☐ Very easy ☐ Somewhat easy ☐ Difficult ☐ Cannot use without help

Sec B. Safety and Accessibility

7. Do you feel safe using the appliance when you are alone at home?
   ☐ Yes, completely ☐ Yes, somewhat ☐ No
8. How long does it usually take you to cook with this appliance compared to your earlier method?
   ☐ Less time ☐ About the same ☐ More time
9. Have you experienced any safety issues while using the appliance?
   ☐ Yes ☐ No
   If yes, please describe: _____

10. Did you face any problems with electricity supply while cooking?
☐ Yes, often ☐ Sometimes ☐ Rarely ☐ Never

11. Do you have to make any further adaptation to make the use easier? (e.g. stool, alternate tools, etc.)
☐ Yes ☐ No

If yes, please describe: _____

Sec C. Financial Impact

1. Have you noticed any change in your household expenses on cooking fuel/electricity since using the appliance?
☐ Decreased ☐ No change ☐ Increased ☐ Don't know

2. Have you spent money on repairs/maintenance of the appliance?
☐ Yes (Amount: Rs. _____) ☐ No

Sec D. Individual Impact

1. How does using this appliance make you feel about your independence?
☐ Much more independent ☐ A little more independent ☐ No change ☐ More dependent

2. Have your family members' attitudes towards your cooking changed since you began using it?
☐ More supportive ☐ About the same ☐ Less supportive ☐ Not sure

3. Has this appliance affected how much time you/ caregiver spend on cooking?
☐ Saves time ☐ Takes the same ☐ Takes longer

4. How important has the appliance become in your daily routine?
☐ Very important, I use it every day ☐ Somewhat important, I use it when needed
☐ Not important, I prefer my old method ☐ I stopped using it

5. What changes have you noticed in your daily life because of this appliance?
☐ Saves time ☐ Saves effort ☐ Safer to cook ☐ Easier to clean ☐ No big change ☐ Other: _____

6. How would you describe your overall feeling about the appliance now?
☐ Very happy / proud to use it
☐ Satisfied but see some challenges
☐ Still unsure about it
☐ Disappointed

7. Has using this appliance made you feel more confident about trying other new things or technologies?
   ☐ Yes, definitely ☐ Maybe ☐ Not really ☐ Not at all
8. Do you think this appliance will continue to be used even after the study ends?
   ☐ Yes, definitely ☐ Maybe ☐ Not sure ☐ No

Sec D. Open ended Questions/ Feedback

How has your confidence changed since the first time you used the appliance?

What did you enjoy most about using the appliance?

What challenges or difficulties are you facing with it?

Do you have any suggestions to make the appliance or its use easier for you?

Would you recommend this appliance to others with similar needs? Why or why not?

Observation Checklist (for Data Collector)

(To be filled quietly while observing and after interaction)

Participant Ergonomics:

How does the participant approach the appliance? ☐ Independently ☐ With assistance
Requires physical support/adaptation? ☐ Yes ☐ No

Family/Caregiver Dynamics:

Caregiver involvement observed? ☐ Active ☐ Occasional ☐ Minimal ☐ None
Does the caregiver appear confident in the participant's ability? ☐ Yes ☐ No
Any restrictions/barriers imposed by family? Notes: _____

Safety Indicators:

Do you see any unsafe wiring, open sockets, or exposed surfaces?
☐ Yes ☐ No
Signs of fear, hesitation, or physical discomfort while using appliance?
☐ Yes ☐ No

Appliance Condition:

Clean and well-maintained? ☐ Yes ☐ No
Signs of wear/damage? Notes: _____
Diary Review:

Entries complete since last visit? ☐ Yes ☐ No

Clarifications needed? Notes: _____

Other Notes (qualitative):

Appendix E Semi-structured interview questions for People with Disabilities (Round One)

Semi-structured interview guide: Inclusive e-cooking - PwDs

- Tell me about yourself, what do you enjoy doing?

1. **First impressions of e-cooking technology**

Over the last few weeks we have given you some electric cooking equipment to try which you have chosen for yourself, and today, we want to talk about how you have found it.

- What were your first thoughts when you saw these appliances at the workshop we had, and then after we brought it to you at home?
- Why did you choose these appliances?
- When you first received the appliances, can you tell me whether it was easy to understand how to set up and use it? Did you need any support from other people? Did you need instructions, or was it intuitive?

2. **Dishes and Gujarati cuisine when cooking with e-cooking appliances**

- Can you tell me about how you have found cooking your favourite food with the appliances? How have things changed in terms of your preparation practices and the time it takes you?
- Can you describe whether some dishes have become easier or harder for you to make?
- Do you feel that the e-cooking appliances have any impact on the taste or texture of food? Can you explain?
- (For those with 2 appliances) Do you have any preferences for using one appliance over the other to cook? If so, which and why?

3. **Usability of e-cooking appliances before simple modifications**

Note to the research team: ***Ask these for both of the appliances if they have two.*** *in turn one by one, in order to get detail about the specific experiences of each appliance.*

- Before we modified the appliance (if done), can you tell me how easy or difficult it was to hold, grip, or operate the equipment?
- Did you experience any discomfort while using it (e.g., pain, strain, awkward angles)?
- Were the buttons/handles/controls accessible to you? Can you explain in detail about your experiences of using the equipment? (E.g. were the buttons big enough, could they

read screens etc.)

- How did the weight, size, or shape affect your ability to use it?
- Did you feel safe using the equipment, and why?
- Did you find it easier to clean the equipment after its usage? Did it require you to be more careful? (for ex, were the blades too sharp? Was it a hassle to keep the cord of the appliance away from the water? etc)
- Usually how much time does it take for you to clean utensils and kitchen areas? Has it been affected after you have started using the appliance/s?

4. **Usability of e-cooking appliances after simple modifications**

- Do you feel the appliance has helped you save time while cooking, has it affected your dependency on others family members? If yes, how does it make you feel?
- Can you describe if and how anything changed for you in terms of how well you could use the equipment after we made some modifications?
- Were there any modifications that helped you to cook with the appliances and how?
- Were there any modifications that you feel were not needed or may have made things more difficult, and why?
- How safe have you felt using the appliances after we made the modifications, and why?

5. **Affordability and support mechanisms to transition to e-cooking**

- Can you tell me if there have been any significant changes in your electricity bill and meter readings since you started using these appliances, and if so, how? (The research will also do a meter reading before giving the appliance and will check the meter intermittently till the period of study).
- If there have been changes in your bill, how do you feel about it and the impact that using these appliances have had on it, and do you think you can afford it if you were to keep using these appliances?
- Are you aware of or do you receive any financial support through social credit or reduced tariffs for your electricity bill?

6. **Recommendations and moving forward**

- Can you tell me whether there are features of the appliances that you would still like to change even more, and if so, how and why?
- After usage of the appliance, If you were to recommend this product, on what features would you recommend it - safety, time savings, dependence or convenience? And what did you like most about this product?
- Would you consider using these appliances as part of your daily cooking moving forwards, and why?

Appendix F Semi-structured interview questions for Caregivers (Round One)

Semi-structured interview guide: Inclusive e-cooking - Caregivers

- Tell me about yourself, what do you enjoy doing?
- How do you usually cook without the e-cooking equipment?

1. First impressions of e-cooking technology

Over the last few weeks we have given you some electric cooking equipment to try which you have chosen for yourself, and today, we want to talk about how you have found it.

- What were your first thoughts when you saw these appliances at the workshop we had, and then after we brought it to you at home?
- Why did you choose these appliances? Are there any features you found unique?
- When you first received the appliances, can you tell me whether it was easy to understand how to set up and use it? Did you need any support from other people? Did you need instructions, or was it intuitive?
- Having had the training, do you think the product will help you save on the electricity bill?

2. E-cooking and caregiving

We would like to understand how e-cooking has impacted you and your experiences as a caregiver, and how it has impacted the extent to which you can involve the person you care for in cooking.

- Have you managed to use these appliances with the person you care for? If so, what dishes did you make?
- How did the person you care for respond to the technology?
- Did it make them feel more independent, safe, or engaged in cooking?
- Did you feel the appliances supported your caregiving, the independence of the person you care for, or both?
- How did it affect your confidence when supervising cooking tasks?

- If you used the appliances with the person you care for, what do you think they found challenging as you used them before we made some modifications?
- What are your reflections on how they found it to use after we modified it?
- If you did not manage to use the appliances with the person you care for, can you tell us why you think it was challenging to do so?
- Is the appliance helping you save time?
- Have you used the appliances yourself?
- If you have used the appliances yourself, how did you find them?
- How easy or difficult was it to learn and start using the new cooking appliances?
- Can you tell me about how you have found cooking your favourite food with the appliances? How have things changed in terms of your preparation practices and the time it takes you?
- Can you describe whether some dishes have become easier or harder for you to make?
- Do you feel that the e-cooking appliances have any impact on the taste or texture of food? Can you explain?
- (For those with 2 appliances) Do you have any preferences for using one appliance over the other to cook? If so, which and why?
- Were there any unexpected issues or frustrations?
- Did the technology change the amount of time or effort required for cooking?
- How do you see this technology fitting into your daily routine long-term?
- Did it reduce or increase your caregiving burden? In what ways?
- How did it affect your confidence when supervising cooking tasks?
- What features would you like to see improved or added?
- Would you recommend this technology to other caregivers or families? Why or why not?

3. **Closing questions**
   - Is there anything else you'd like to share about your experience with cooking technologies?

- After usage of the appliance, If you were to recommend this product, on what features would you recommend it - safety, time savings, dependence or convenience? And what did you like most about this product?
- Do you have any advice for designers and researchers working on these tools?

Appendix G: Semi-structured interview questions for PwDs (Round Two)

Interview Questions Round 2 (PwDs)

1. During the process of using this appliance, what changes or adjustments did *you* have to make at your own level?

- Were these changes easy to make?
- Did they tire you?
- Did they make you feel more comfortable/confident/independent etc?

2. Did you feel proud, hesitant, or worried about being watched while using the appliance?

3. What role did your family play throughout this journey?

- Who decides whether you should use this appliance or not?
- What kind of support did you receive from them, and in what ways?

- Were there any actions, attitudes, or situations that felt like obstacles or made this journey more difficult for you?
- Has anyone's perception of your ability changed since you started using it?
- Is there anyone who discourages you from using it? Why do you think they feel/felt that way?

4. What were some things that felt difficult in the beginning but do not feel as difficult anymore?

- How long did it take before you felt confident with the appliance usage?
- How did you find solutions to these challenges?

- What did you actually do to overcome them? Was there a moment where you felt 'Now I can do this?'

5. Were there any challenges that felt like barriers and made you feel that the solution was not in your control?

(For example: related to infrastructure, cost, electricity, design, or social factors)

6. Did you worry about the cost of electricity while using the appliance? Did anyone in the house comment on *'Bill Badhega'?*

7. Based on your experience so far, what do you feel are the strengths of using the induction cooktop/EPC/Rice cooker (ask about all), particularly in terms of your disability?

8. What features of the induction/EPC/Rice cooker (*ask about all used) don't you like and feel could be improved in the context of your disability?

- Tell me about your experiences with Screens, buttons, switches etc - anything related to the physical design - and how you think these could be changed to make it easier for you?

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9. What types of dishes do you find easier to prepare on the induction cooktop/EPC/Rice cooker? *why* are they easier for you in particular?

10. Are there any dishes that you prefer *not* to prepare on the induction cooktop/EPC/rice cooker?
Why do you avoid making these dishes?

11. Apart from your family, is there any specific person or factor that has strongly supported you in using this appliance?

(This could be a person, the design of the machine itself, prior experience, community support, or anything else.)

How and Why?

12. If this appliance was not provided through the project, do you think you would have bought it if you ever found out about it? Why or why not?

13. If this appliance was taken away from you tomorrow, what would you miss the most about it? What would you feel relieved about?

14. Who do you think this appliance works best for? Who might struggle the most, and why?

15. Do you think you will continue to use the appliance for the longer term, and why?

16. Can you tell us about any kind of support you would need to do so?

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