Speaking in Terms of Money: Financial Knowledge Acquisition through Speech Data Generation

Advait Bhat*
Microsoft Research India
Bengaluru, KA, India
advaitmb@gmail.com

Nidhi Kulkarni*
Karya
Bengaluru, KA, India

Aditya Yadavalli
Karya
Bengaluru, KA, India

Jivat Neet Kaur
UC Berkeley
Berkeley, CA, United States

Anurag Shukla
Karya
Bengaluru, KA, India

Monali Shelar
Karya
Bengaluru, KA, India

Safiya Husain
Karya
Bengaluru, KA, India

Vivek Seshadri
Microsoft Research India
Bengaluru, KA, India

ABSTRACT

Earning a living often leaves low-income individuals with little time for learning new skills, perpetuating a cycle where the need for immediate income restricts access to learning. In this study, we investigate if crowd work, specifically speech data generation, can facilitate financial knowledge acquisition. We conducted a two-week financial literacy program with low-income individuals (n=37) in Wagholi, a semi-urban area in Pune, India. Participants read aloud and recorded a nine-lesson financial curriculum, earning ₹2000 (≈$24) for ≈90 minutes of voice-recording. By conducting pre- and post-tests, we found a 41.6% mean increase in participants' financial knowledge, notably in foundational areas such as budgeting and investment. Twelve follow-up interviews indicated the work was accessible and conveniently integrated into participants' daily lives. Additionally, the program triggered attitude change among participants and community dialogue about critical financial concepts. Our results suggest that crowdwork can become an effective method for knowledge acquisition.

CCS CONCEPTS

• **Human-centered computing → Empirical studies in collaborative and social computing**.

ACM Reference Format:
Advait Bhat, Nidhi Kulkarni, Aditya Yadavalli, Jivat Neet Kaur, Anurag Shukla, Monali Shelar, Safiya Husain, and Vivek Seshadri. 2023. Speaking in Terms of Money: Financial Knowledge Acquisition through Speech Data Generation. In *Proceedings of ACM Conference (Conference'17).* ACM, New York, NY, USA, 24 pages. https://doi.org/10.1145/nnnnnnn.nnnnnnn

*Both authors contributed equally to this research.

Conference'17, July 2017, Washington, DC, USA

ACM ISBN 978-x-xxxx-xxxx-x/YY/MM…$15.00
https://doi.org/10.1145/nnnnnnn.nnnnnnn

1 INTRODUCTION

Low-income individuals often work long hours for low wages, leaving little time for skill development and learning [38]. This creates a cycle in which the need for immediate income limits individuals' opportunities for upskilling in areas such as financial literacy, which could otherwise enable their upward economic mobility [33, 46, 61, 75]. With the rise of crowdwork as a significant labor sector in India, an increasing number of low-income Indians are turning to crowdwork as a supplementary source of income [23, 27, 28]. We aim to study if crowdwork can serve as a conduit for financial education, which could allow low-income Indians to learn important financial concepts *while* earning a supplemental income.

If successful, this approach offers dual benefits: enabling learning for the worker, and generating valuable speech data. This study merges speech data collection with financial literacy education. The reasons for this are two-fold: first, speech data collection in traditionally underrepresented languages can contribute to the ongoing efforts in language technology development for low-resource Indian languages [40]. Second, it can generate domain-specific speech data on financial terms and concepts in low-resource languages, which, to the best of our knowledge, has not yet been done.

For this study, we worked with a Marathi-speaking stone quarry worker community from Wagholi, a semi-urban area near Pune, India. Marathi, despite having a large community of 83 million speakers, is considered a low-resource language in learning technology literature [40], with only a few large scale speech data collection efforts conducted till now [11, 16]. Therefore, we find Marathi to be a good candidate for our study.

Our study poses the question: Can low-income, semi-urban Indian workers learn financial literacy concepts while earning through generating speech data in Marathi?

To answer this, we developed a nine-module financial literacy curriculum in which participants read aloud and recorded the learning material though a smartphone app, one sentence at a time. The curriculum is designed with the intention of framing workers as learners and adopts a dramatized story-based format. This is designed using an 'education-through-entertainment' framework to ensure worker engagement while teaching important financial

concepts [14, 20, 54]. Each lesson was followed by a comprehension quiz designed to provide participants with feedback on their understanding and retention of the story, along with open-ended subjective questions designed to elicit self-reflection on the concepts learnt.

We deployed this curriculum over a two-week-long financial literacy program in Wagholi through Karya [applink], a digital work platform. We recorded the pre-intervention financial knowledge of recruited participants (n=37) and compared it with their post-intervention knowledge through a pre-post-test design. We conducted semi-structured interviews with a subset of the participants(n=14) to get a deeper understanding of how the intervention interacted with participants' lives. Along with evaluating this approach's effectiveness as an educational intervention, we also evaluate the quality of the data generated. Participants were paid ₹2000 (≈$24) for the successful completion of all modules.

Our results are encouraging. Participants showed an average percentage improvement of 41.6% in their knowledge of financial concepts as a result of the intervention. High scores in comprehension tests (82.5%) indicated that participants understood the stories, demonstrating participants' engagement with the content they were reading aloud and recording. Finally, interviews revealed interesting behaviours participants engaged in during the course of the intervention such as peer support, and knowledge sharing along with initial indications of change in old financial behaviour. Our findings showed that participants were drawn to the work through both, the intrinsic motivator of learning and the extrinsic motivator of the financial incentive.

2 RELATED WORK

Our work is informed by prior research on crowd-sourced work for underserved communities, the intersection of crowdwork and learning, conditional cash transfer interventions, and the impact of financial literacy and financial literacy interventions.

2.1 Crowd-sourced work for underserved communities

In developing regions like India, crowdwork is emerging as a significant sector in the labour marketplace. India ranks second only to the United States in the number of workers on platforms like Amazon Mechanical Turk [27, 28]. From 2018 to 2022 the proportion of households with smartphones has doubled from 36% to 74.8%, with many states going above 90% [1]. This proliferation of smartphones in India has made crowdsourcing platforms especially more accessible on mobile interfaces [23, 39, 70]. This, along with the elimination of the need for former qualifications [67] on crowdwork platforms has further reduced barriers of entry and spurred a recent interest in employing low-income communities in developing countries such as India [23]. This promise of a supplemental income source through crowdwork has led to a surge in the development of various crowdwork platforms such as Respeak and Karya specifically targeted towards low-income communities [23, 35, 36, 69, 70].

Bringing crowdsourcing to semi-urban and rural Indians comes with dual benefits. First, by providing digital work and the promise of additional income to local language speakers in underserved communities. Second, by generating valuable data from a diverse set of local language speakers traditionally underrepresented in speech and language datasets.

These dual benefits, along with poor availability of speech data in low resource languages like Marathi [63], have sparked an interest in crowd-sourced speech data generation in these languges [11, 39, 52]. Recent studies have also shown that crowdsourced speech data from low income participants is comparable to data collected from commonly recruited populations, like university students [11].

However, despite the increasing demand for crowdsourced work for low-income workers and benefits it promises, workers may feel undervalued, isolated, and overworked [23, 35]. While crowdworkers may engage in crowdwork for various reasons such as flexible schedules and intellectual challenges, not just pay [19, 45, 78], the tedium and low possibility for skill development in crowdwork may not provide them with much value apart from the pay, unlike traditional knowledge work [17].

Responding to this gap, future visions for crowdsourced work emphasize the need to move beyond just financial rewards, for intrinsic motivators like learning to be explicitly designed in crowdwork [43]. Including learning opportunities in crowdsourced work has the potential to make work more meaningful for the worker while also ensuring quality for the requester, bridging this value asymmetry [17].

2.2 Crowd-sourced work and Learning

Crowdwork can involve learning even when it is not explicitly designed for. Workers may need to develop their knowledge and skills to perform tasks better or to be able to take more complex tasks. Crowd-workers' self-regulated learning has been documented, with workers reported to engaging in more challenging tasks, studying literature and online resources along with sharing knowledge and collaborating with others [50]. Research suggests that while crowdworkers do not explicitly plan for learning new skills like traditional knowledge workers do, their learning practices are largely similar to conventional workers despite working outside organisational structures [51]

Researchers have explored various ways of making learning more explicit in crowd work in order to make workers better at their primary task. Gadiraju et al. [30] focus on training to improve the performance of crowd workers in microtasks. They implement both implicit and explicit training modules and find that training improves task performance while reducing completion time. Researchers have used methods such as market-based task allocation and peer coaching for improving worker skill and task quality [21, 62]. Nakayama et al. [53] explore the use of AI as co-learners, helping to improve the skills of crowd workers.

While the goal of these approaches is primarily to make crowdworkers better at the task at hand, other approaches have explored ways to make crowdworkers capable of performing more complex tasks. Wang et al. [74] develop a microtask workflow to train workers in historical thinking skills to gain domain expertise in historical document analysis while maintaining work quality, with a slight negative impact on efficiency. In the realm of citizen science, Lee et al. [47] integrate learning of advanced scientific concepts within image classification tasks, enabling participants to learn to perform more challenging tasks.

Most closely aligned with our approach, some research reframes crowdworkers as learners. This approach is notably used in the realm of language learning, pairing language learning with data generation. For instance, Duolingo combines language acquisition and data generation for translation services [73]. LingoTowns focuses on enabling integrated language learning within a virtual world while annotating documents [48]. Culbertson et al. [25] use a crowdsourced video captioning system that enables language learning through correcting video captions. Beyond language learning, Bigham et al. [17] leverage crowdwork for upskilling in the domain of audio transcription. They facilitate skill development in stenotype —a text-entry method—while completing transcription tasks.

The idea of learning through crowdwork — where crowdworkers are paid to work — is also closely related to the idea of conditional cash transfers (CCTs). CCTs have been demonstrated to work for promoting positive behaviours in the context of health and education [29, 59]. CCTs, also used in the form of Education Maintenance Allowances (EMA) have shown to encourage young people in low income households to participate in and continue post-compulsory education [31, 49]. Technological interventions have also been explored in the domain of CCTs. Swaminathan et al. [66] explore using conditional mobile payments as a method of disseminating knowledge and awareness about important topics such as health and governance among low income communities. However, the cost-effectiveness of CCTs still remains in question [59] Combining crowdwork for low income communities with learning can bridge this gap by generating economic value through the data, potentially making this learn-to-earn model self-sustaining.

Motivated by the above literature, in this study, we aim to combine the crowdwork task of speech data collection with the intended outcome of learning. For this study, we focus on financial literacy as the knowledge domain.

2.3 The Impact of Financial Literacy

The Organisation for Economic Co-operation and Development defines financial literacy as 'a combination of financial awareness, knowledge, skills, attitudes and behaviours necessary to make sound financial decisions and ultimately achieve individual financial well-being [5].'

Financial literacy has shown to have a positive impact on a macroeconomic as well as a microeconomic scale. On a macroeconomic scale, financial literacy plays a vital role in overall economic growth and development [72], along with making individuals, and thereby the economy better equipped to deal with macroeconomic shocks [44]. On an individual level, increased financial literacy correlates with an improvement in personal financial behavior, including more effective financial planning, especially in developing economies like India [46]. This impact extends to a household level, where a higher level of financial understanding has been shown to positively influence wealth accumulation [15]. Moreover, financial literacy serves as a vehicle for poverty reduction. Evidence from China suggests that households with better financial understanding are more likely to engage in entrepreneurial activities and take advantage of commercial insurance options, effectively mitigating their relative poverty status [75].

The benefits of financial literacy are especially impactful in developing countries, like India — with financial literacy often shown to improve financial inclusion [33] and lead to empowerment of marginalized demographics, such as women, by enabling economic independence [61].

Despite the role of financial literacy in equipping citizens to make better financial decisions for themselves along with its economic value, not enough people have sufficient financial literacy, with only an esitamed 24% of Indians being financially literate [8].

Recent years have seen a push from government organizations through campaigns for promoting financial literacy. These include the Reserve Bank of India's (RBI) efforts to provide elementary financial literacy information to general public via the FAME (Financial Awareness Messages) booklet [10], along with the establishment of the National Council of Financial Education and the initiation of its Financial Education Training Program in schools and colleges [3].

Traditionally, financial literacy programs are offered in classrooms and workshops. Research shows that these interventions effectively improve financial understanding in students [32] and low-income groups [77] on topics like interest rates, predatory lending, banking, savings, and credit use. Large-scale randomized controlled trials (RCTs) confirm this efficacy, showing a 6.1 percentage point increase in financial knowledge after a one-day workshop [2]. Mobile-based interventions have also proven effective; participants exposed to an online financial literacy program were more likely to pay bills on time [22].

Considering the aforementioned literature and the participant demographics we aim to work with, we believe it is prudent to begin an inquiry into the efficacy of crowdwork as a method of knowledge dissemination with financial literacy as a subject matter to be taught.

3 METHODS

In this section we detail out the methods used for the design, implementation and analysis of the financial literacy intervention. Our study was aided by three partner organisations. (1) Parinaam Foundation, a Bengaluru based non-profit [6], (2) Santulan, an NGO based in Wagholi, Pune [7] and (3) Karya, a digital work platform [4]. All three organizations' primary beneficiaries are low-income, socio-economically marginalized communities; Parinaam Foundation was our program development partner, Santulan was our on-ground community partner, and Karya was our program deployment partner.

3.1 Design

3.1.1 Curriculum Design. The goal of creating this financial literacy curriculum was two-fold: **(1) enabling individuals to learn core financial concepts and (2) generating valuable labelled speech data about financial literacy in Marathi**.

To develop the curriculum, we took initial inspiration from the Diksha Financial Literacy Program (FLP) by Parinaam Foundation [6] and Ujjivan Small Finance Bank [9]. The Diksha (meaning 'initiation') Program caters to low-income, urban and semi-urban populations of primarily less educated women who have typically moved from rural India. Two research team members attended five training sessions to understand the training procedures used for the

Diksha Program: four in Bengaluru and one in Mumbai. The program trained its beneficiaries in budgeting, saving, borrowing and debt management through storytelling, flashcards and interactive question-answer sessions. The entire training consisted of five two-hour sessions, conducted once a week. Each session involved 15-20 women and took place in community centres, temples, local schools, or private homes. This in-person gathering fostered community discussion about financial concepts. However, the sessions were conducted in the afternoons, which seemed inconvenient for participants; this was expressed by some participants bringing young children, while others left midway.

Following our visits, we designed a story-based financial literacy curriculum using the Diksha FLP as the content base and used the Sabido Methodology [14, 20, 54] for the design. The Sabido Method employs a dramatized soap opera format to raise awareness about social issues, initially used for issues like HIV/AIDS and family planning in Africa and Mexico [14, 20, 64]. Utilizing an education-through-entertainment strategy, the method features characters and plots that audiences can relate to. It aims to engage its audience through ongoing storylines that showcase evolving behaviors and attitudes, and employs one or more characters to whom the audience can relate to and model themselves on. This character typically starts off as naive and opposing the value being presented. As the plot progresses and with interactions with other characters, the main character learns and starts embodying the underlying message. The deployments of this technique in Africa and Mexico in the form of radio soap operas proved to be cost-effective and impactful. These deployments have seen an increase in the audience's willingness to discuss social issues such as family planning, as well as a heightened awareness of HIV/AIDS risks [14, 20, 58].

The story we developed follows two fictional characters — Kala and Rama. Rama and Kala are sisters who worked as domestic helpers in an unnamed tier-one city in India. The 'Kala' character is primarily designed for the participants to relate to, while Rama is her elder sister guiding her on her journey of financial literacy. Over the course of the 9 modules Kala goes from being financially unaware and in debt to running a successful small business. The stories primarily involve narration and dialogues between these two characters and other characters they meet during their journey.

The curriculum was first conceptualized in English and went through two revisions with Parinaam to ensure accuracy on the procedural and conceptual details of the small finance banks mentioned. Post finalization, the curriculum was translated into Marathi with an emphasis on keeping the tone informal and the dialogues colloquial. Financial terms were transliterated instead of translated as research shows Marathi speakers typically find financial terms in Marathi difficult to understand [12]. Additionally, the sentences were kept short to ensure they could be read-aloud in one go and were well incorporated into the voice-annotation framework. Table 1 shows the module-wise curriculum along with a short description of each module.

3.1.2 Task Design. Participants received each module sentence-by-sentence and were required to read each sentence aloud while recording it. Along with generating data, reading aloud sentences also leveraged the Production Effect, a phenomenon that enhances retention when text material is read aloud as opposed to read silently making it a beneficial and enduring study strategy [37, 56]. Participants also had an option to listen to and re-record sentences if they weren't satisfied with their recordings. The curriculum consisted of a total of 898 sentences with an average of 10.43 words per sentence. The minimum sentence length was 2 words and the maximum 24 words. The Table 1 shows a module wise breakdown of the number of sentences participants had to read. Each module was followed by 3 objective comprehension questions (4 option MCQ format) and 2 subjective questions prompting participants to briefly articulate and record their learnings from each module. This was aimed at helping participants self-evaluate their learning and revise concepts they couldn't remember or did not understand. The comprehension questions can be found in Appendix B.

3.1.3 Training. We began the program by training recruited participants to use the Karya application and perform tasks on it. The training sessions were conducted in Marathi by members of the research team on each of the 4 recruitment days and lasted 90 minutes. Consent forms were given to participants during the training session via the app. The format of the training sessions was as follows:

(1) Explanation of the intent of the program, with emphasis on the fact that they would be paid regardless of their performance on the pre and post-testing.
(2) A presentation of the platform and a demonstration of all the interactions the participants would be required to perform on it.
(3) Installation and activation of the Karya application on participants' phones.
(4) Consent form signing and explanation of data usage for participants with doubts.
(5) Taking the participants through demo tasks in order to familiarize them with the mechanics of interacting with the platform.
(6) Administering the pre-test

3.2 Community and Participants

We chose Maharashtra as the area of study as the two primary researchers in the study were native Marathi speakers and would be able to conduct interviews and training without the need for translation. The participants recruited were all beneficiaries of Santulan, and belonged to a community of stone quarry workers who had migrated to Wagholi from different parts of rural Maharashtra and neighbouring states in search of livelihoods. Almost all members of this community were themselves employed as stone quarry workers or had family members who were employed at the quarries at present or in the past.

Santulan has been instrumental in the development of this community since 1997; helping them gain housing rights, ration cards and access to education, resulting in the community fostering a great amount of trust towards them. Consequently, our recruitment process was made much easier by the active involvement of Santulan.

3.2.1 Recruitment. We recruited 65 participants over the course of 4 days by inviting them to one of two chosen recruitment centers

Table 1: Descriptions of Modules with number of sentences participants had to read.

#	Section Name	Section Descriptions	Sentence Count
1	Financial Planning and Saving	This chapter emphasizes the importance of financial planning and saving, especially during uncertain times.	74
2	Needs vs. Wants	This chapter highlights the distinction between essential needs and non-essential wants, emphasizing the significance of prioritizing expenses to ensure financial well-being.	102
3	Budgeting	This chapter introduces the concept of budgeting as a crucial tool for financial management.	79
4	Savings Bank Account	This chapter provides an introduction to the concept of banking, focusing on the benefits of opening and maintaining a savings bank account.	89
5	Opening a Bank Account	This chapter dives into the practical aspects of opening a bank account, demystifying the process for those unfamiliar with banking procedures.	113
6	How to manage and access your money in a bank account	This chapter introduces the basic bank account management tools like passbooks, ATM cards, and cheque books.	104
7	Investments	This chapter introduces the concepts of Fixed Deposits (FD) and Recurring Deposits (RD).	75
8	UPI	This chapter educates about the UPI system, a digital payment method in India.	126
9	Borrowing	This chapter delves into the concept of borrowing, focusing on when and how to responsibly take a loan from formal institutions.	136

(a school run by Santulan and the Santulan main office) and introducing them to the program. Recruited participants were added to Whatsapp groups, since it was found to be the universally used and understood method of communication. These groups were made based on the days on which participants started the program and were used to communicate key dates and information. Out of the participants we initially recruited, 55 were able to complete all modules within the 15 days we ran the study.

3.2.2 Study Sample. The goal of the study was to test if the program was effective in educating participants with low levels of financial knowledge and the curriculum of the program was designed as such. Thus, for the study population, we used pretest scores as an exclusion criteria for participants who already had high levels of knowledge on the concepts covered in the curriculum. Participants who had pretest scores >80% were considered to have high knowledge for this program, and would only have diminishing returns from their engagement. While we included these participants in the program and paid them for their work,

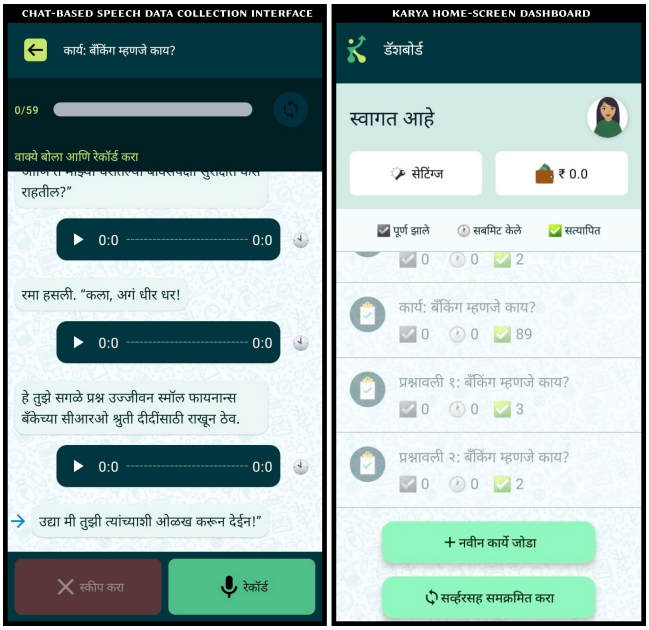

Figure 1: Screenshots of the Marathi financial literacy curriculum deployed on the Karya platform. Left image shows the chat-based interface used to deploy voice recording microtasks and tests. The right image shows the main platform dashboard which displays a list view of the modules (tasks)

we excluded these participants from the analysis. Leaving us 37 participants who completed all modules and also had a pre-test score below 80%.

The findings in the paper pertain to these 37 participants, 78% (n=29) of whom were women and 22% (n=8) of whom were men. All participants were aged over 18 (Mean age = 31.8, SD=9.9). All had a monthly income of below INR 15,000 and were considered part of the lower-income group based on the categorization of the Ministry of Housing and Urban Poverty Alleviation, Government of India (Indian citizens within the income bracket of 3 to 6 Lakhs p.a. [55]). All had at least a middle school education and could read and speak Marathi.

3.3 Deployment

The financial literacy curriculum was deployed on Karya, a smartphone-based microtasking platform that provides accessible crowd work opportunities to low-income communities [4]. The platform is able to deploy a wide array of microtasks on low-cost smartphones, with minimum data connectivity requirements. The platform also enables workers to view the app in their local language and work from anywhere, at any time, adding to its accessibility and making it easier for workers from low-income communities to participate.

Each of the nine modules in the curriculum was deployed as a task, with each sentence from the module becoming a microtask that was a sentence to be recorded. Data connectivity was required at the beginning of each module, or task, to ensure all microtasks were downloaded into the local memory. These sentences, or microtasks, were displayed on Karya's chat-based interface - which is intentionally similar to WhatsApp, giving users a sense of familiarity and enabling ease of usage. This chat interface allowed users to scroll up and read previously recorded sentences and re-record sentences if they so wished. The continuity afforded by a chat interface platform also lended itself especially well to the story based curriculum as it enabled users to have a feeling of continued progression in the story.

3.3.1 Payments. Participants were paid 2000 rupees in cash (at a rate of 2 rupees per task) once they completed all the modules and the post-test. Participants who did not complete the program were paid at the rate of 2 rupees per task for the number of tasks they had completed at the end of the two-week study. Participants who were interviewed were paid prior to the interview to avoid bias in their responses.

3.3.2 Reminder Calls and Technical Support. Usage of the Karya platform enabled us to track participants' rate of task completion. Subsequently, participants who had inconsistent rates of task completion (based on engagement data) were given reminder calls by members of the research team. Team members also placed calls to resolve the technical difficulties of participants who reported the same on the WhatsApp groups. These difficulties were largely related to the application malfunctioning in ways such as new tasks not loading, audio playback issues or speech data corruption issues.

3.4 Experiment Design, Data Collection and Analysis

We used a within-subject pre-post test design to measure knowledge gain of 37 participants, followed by semi-structured interviews with 14 participants post program completion. To analyze and synthesize our findings, we used a concurrent convergent mixed methods design [24]. This approach allowed us to identify the objective and subjective effects of the program by (1) quantitatively measuring its efficacy and (2) qualitatively understanding how participants responded to it. To measure efficacy we designed a **test of 27 questions in MCQ format**, 3 each per 9 modules. Each question had four answer options and one "I don't know option", out of which only one was correct. A pre- and post- test design is a common method used for measuring the efficacy of financial literacy interventions [32, 77]. The same test was administered once before the program and once after. Participants gave the pre-test at the end of the training session before beginning the modules and the post-test at home after they had completed all modules. The order of the questions was randomized during test administration. Participants were not informed about the correctness of their answers in either of the tests. Comparing and analyzing the difference between the results of the pre and post-tests allowed us to measure overall and module specific knowledge gain across participants. Additionally, data from the comprehension tests helped us validate participants' understanding of the lessons and telemetric data in the form of time-stamped task completion metrics was used to analyze users' working patterns. We used a paired-samples t-test to test the significance of the pre and post-test score difference and a Wilcoxon signed rank test for testing module-wise knowledge gain.

Out of the 14 interviews we conducted, the first 9 were conducted at the Santulan Pashan Shala School (a school for children belonging

to the quarry worker community) and the latter 5 were conducted at the main Santulan office. Participants were interviewed privately by 2 research team members, one of whom was female to ensure the comfort of the female interviewees. We collected a total of 2 hours, 30 minutes of Marathi language qualitative interview data which was transcribed and translated to English. Subsequently, we engaged in qualitative coding of the data using thematic analysis [18] in MAXQDA software [65]. To begin, two authors individually took multiple passes at the data, and subsequently performed open coding, avoiding pre-supposed codes. They then carefully grouped the open codes along with merging overlapping codes and discarding duplicates, resulting in a codebook of 26 codes. Example codes included 'existing financial behaviors', 'eagerness to learn', 'able to work through the day', 'relating to characters' etc. These codes were then clustered into candidate themes. Candidate themes were then reviewed by revisiting the data and codes. The process led to generation of higher-level themes such as 'emotion and trust', 'interaction with family members', 'financial aspirations' and 'peer support and accountability' etc. To synthesize the findings we followed an analysis sequence of quantitative followed by qualitative, and have henceforth presented them in an integrated manner, providing a statistical and contextual understanding of the effectiveness as well as the effects of the program.

Our study, including the methods and data collection practices were reviewed and approved by our institute review board.

4 FINDINGS

Our findings provide quantitative and qualitative evidence to show the effectiveness of the financial literacy program. We start by detailing the effect of the intervention on participants' knowledge gain through a module-wise analysis of their pre and post test scores. We then present the role the design of our intervention played in enabling the praticipants to learn. Finally we share the emergent behaviours displayed by the participants as a result of our intervention.

4.1 Measurable Knowledge Gain

In this section, we detail the analysis of participants' pre and post-test scores to measure the overall and module-wise change in knowledge.

Before the intervention, most participants did not have an in-depth understanding of financial concepts, observed through a mean pretest score of **15.7 out of 27 (SD=4.1)**, with 21 being the maximum mark scored by a participant and 5 being the lowest. As participants (n=37) completed all nine modules, they cumulatively recorded 56.1 hours of audio through reading-aloud lessons, with each participant recording an average of 90.8 minutes of audio, reading out a total of 898 sentences.

After completing all nine modules, we administered the post-test to measure the change in participants' financial literacy. We observed a mean score of **22.2 out of 27 (SD=3.2)** in the post-test, with 6 participants scoring full marks. To measure the increase in participants' knowledge after the intervention, we calculated pairwise differences between the pre-test and the post-test for all participants.

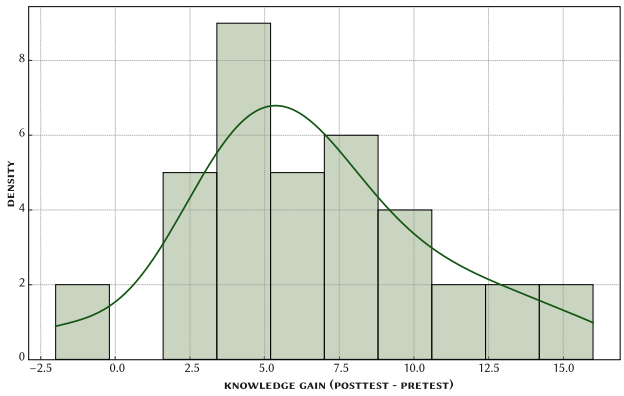

Figure 2: Histogram of the distribution of the knowledge gain (difference in pre-test and post-test scores) overlaid with a density plot.

Figure 2 shows a histogram of the change in knowledge gain overlaid with a density plot revealing a somewhat bell-shaped distribution, suggestive of normality. A formal test for normality, the Shapiro-Wilk test, yielded a*p-value* of 0.3186. This value, greater than the typical threshold of 0.05, suggests that the distribution of differences in scores is not significantly different from a normal distribution.

Given the results of the normality test, we opted to use the paired-samples t-test to test whether the intervention has a significant effect on participant's knowledge. The paired-samples t-test found a significant increase between the **pre-test (M=15.7, SD=4.1) and post-test (M=22.2, SD=3.2) scores; t-Statistic: −9.6788, *p-value*: 1.475e−11 (*p*<0.0001).** Participants had a mean percentage point increase of **41.6%** between the pre-test and the post-test. An effect size (Cohen's d) of 1.5912 further indicated a large practical significance of this difference, implying that the intervention had a significant and substantively important effect. 3 visually shows the increase in knowledge gain, with a shift in the median test scores of participants from 17.0 in the pretest to 23.0 in the post-test, with all participants scoring above 14.0 marks in the post-test.

Table 2 shows a module-wise breakdown of the pretest and post-test scores and the percentage point knowledge gain. A Wilcoxon signed-rank test after adjusting for multiple comparisons using Bonferroni correction revealed that all module apart from Module 1: 'Financial Planning and Saving' and Module 6: 'How to manage and access your money in a bank account' showed a statistically significant increase in knowledge gain. The highest knowledge gain was seen in the 'What is Banking' (83.3%) and 'Investments' (108.5%) modules. Details of module-wise knowledge gain along with a qualitative analysis of the same are presented below:

4.1.1 Fundamental Financial Concepts. We found that participants were generally aware of the importance of savings and having money available during emergencies. Participants had a moderately high pretest score of 2.3 in the 'Financial Planning and Saving' module. These scores were representative of participants' reports of *saving through informal methods* before the intervention. P9

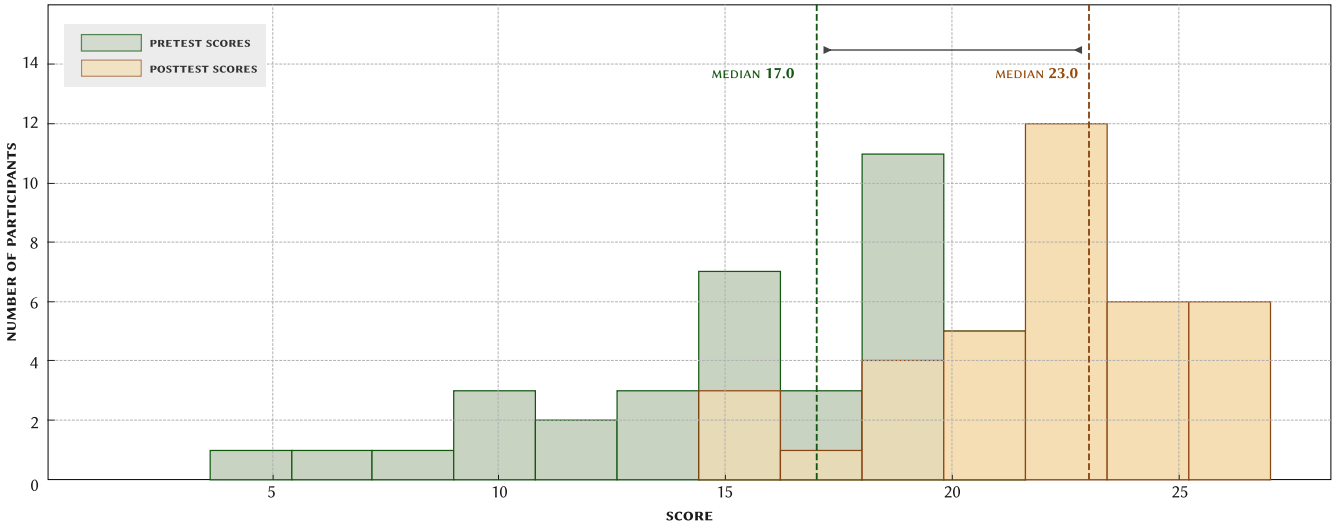

Figure 3: Superimposed histograms of the pre-test and post-test score distributions to highlight the difference in their median scores.

Table 2: Pre-test scores, post-test scores and knowledge gain: Overall and module-wise

#	Section Name (English)	Pre-test		Post-test		% Difference
		Mean	SD	Mean	SD	
1	Financial Planning and Saving	2.3	0.8	2.5	0.6	10.59%
2	Needs vs. Wants	1.4	0.9	2.1	0.9	49.06%**
3	Budgeting	2	0.7	2.6	0.5	28.38%***
4	What is Banking?	1.3	0.8	2.4	0.8	83.33%***
5	Opening a bank account	2.2	0.9	2.8	0.5	28.40%***
6	How to manage and access money	2	0.7	2.4	0.8	18.67%
7	Investments	0.9	0.8	2	0.9	108.57%***
8	UPI	1.7	1.1	2.6	0.6	50.79%***
9	Borrowing	1.8	1	2.8	0.4	57.58%***
Total	**All Sections**	**15.7**	**4.1**	**22.2**	**3.2**	**41.6%****

*p<0.05, **p<0.01, ***p<0.001; After adjusting for multiple comparisons using the Bonferroni correction, modules 2, 3, 4, 5, 7, 8, 9 remain statistically significant. However, modules 1 and 6 fail to remain statistically significant with an adjusted alpha of 0.00556.

shared, *"I don't have a bank account, but sometimes I put money in a money box."*

This was not the case with the 'Needs vs. Wants' module. Participants found distinguishing between discretionary (wants) and mandatory (needs) expenditures difficult, with them scoring 1.4 out of 3 in this module. After the intervention, however, participants showed a substantial improvement of 49.06%.

Participants also lacked the practical knowledge of budgeting, such as maintaining a record or diary. A question-wise analysis of the pre-test revealed that only 37.8% of participants knew the importance of maintaining a diary before the intervention. After the

intervention, a higher number of participants, 62.2, could correctly tell the importance of a budget diary.

The increase in knowledge in these fundamental concepts is confirmed by P1's statement of what they learnt: *"I learnt that it is important to avoid unnecessary spending and keep a record of spent money. This can help us see where we spend the most money and save wisely"*, and how they would apply this learning: *"Everybody has a mobile phone, and nobody watches the TV at home, so I will not spend on its recharge as it is an unnecessary expense. Instead, I can save that money."*

4.1.2 Basics of Banking. Several participants reported having bank accounts but did not use them often. P1 expressed this, *"Many people have bank accounts, but they don't access them."*. Participants' procedural knowledge of how to open bank accounts is corroborated by the moderately high average pretest score of 2.2 out of 3 on the 'Opening a bank account' module, with 75% of participants being able to answer 'How to open a bank account?' correctly in the pretest.

However, participants were largely unaware of the importance of using their bank accounts and how to use them systematically. On average, participants had a low pretest score of 1.3 in the 'What is Banking' module. A question-level analysis of the pre-test (*found in Appendix C*) revealed that participants had a poor grasp of the foundational concepts of banking. Before the intervention, only 40.5% of participants could correctly answer the question 'What is interest?', and only 21.6% of participants knew why keeping one's money in a bank is safe.

We observed an average 83% increase in scores in the 'What is Banking' module, with 94.6% answering the 'What is interest?' question correctly in the post-test. This increase in the fundamental knowledge of banking echoed in multiple participants' sentiments. P5, for instance, stated, *"I had misconceptions about if I keep money in any bank then will I get the money back? I did not have that guarantee, but after reading this, I know that it is safe to deal with banks."* While P6 learnt how to identify a trustworthy bank, sharing, *"I understood that we should not use banks like Rupee Bank. Real banks are under RBI rules, and we should only use them."*. And P10 stating, *"Now I know if I save money in a bank, I will get interest on it. So, instead of saving money at home, I should save it in the bank"*

4.1.3 Investing. Across all modules, the 'Investing' module had the lowest pre-test scores of 0.9, with only 8.1% of participants knowing what a recurring deposit was. This module saw the highest score improvement, with an increase of 108.6% between participants' pre and post-test scores. While some participants, like P1, had a bank account, they were largely unaware of and even had some misconceptions about investments and interest rates. Speaking of their banking practices, P1 - said, *"I just used to keep my money in the bank account. I didn't know about RD or FD, so I never got a lot of interest on the money I put in. Now, I learned how we can earn monthly interest. I am definitely going to make a fixed deposit, or maybe I will invest in RD"*. Similarly, P8's fears surrounding investing were allayed by the curriculum, *"I had doubts about those 'investment people' who scam us. But now I know they are under RBI's authority and that they will keep our invested money safe."*

4.1.4 UPI. Owing to its popularity across India, 64.9% of participants could correctly answer the question 'What is UPI?' but were unaware of its benefits. The 'UPI (Unified Payment Interface)' module had a relatively low pretest score of 1.7, with only 37.8% of participants being able to answer 'What are the benefits of using UPI?' correctly. We saw an average 50.79% increase in knowledge in this module. Participants reported overcoming their misconceptions about UPI being fraudulent, with P1 remarking, *"I was worried about my money getting deposited in someone else's account, but after reading this, I learned that nothing of that sort will happen. I learned that UPI is a safe way to transfer money and not a fraud."* Participants also learned how to execute secure transactions and mitigate security risks while using UPI, thus gaining confidence in using the interface. P4 stated, *"I learned that it is safe to enter your UPI pin only when paying someone, not while receiving money and that we should not share it with others"*

4.1.5 Borrowing. There was a moderate improvement of 57.6% in this module. Crucially, participants learned about the differences between borrowing money from a moneylender versus borrowing money from a bank, with 100% of participants getting the answer to this question right in the post-test. P1 highlighted this point, *"If we borrow money from a moneylender, they will visit our house and mentally harass us. But by taking a loan from a bank instead, we can avoid exploitation and mental torture from the money lender."* Other participants like P14 now saw bank loans as an enabler to start a business, *"I learnt we can take a safe loan from the bank, and which could help us start our own small business in the future."*

In summary, the intervention significantly improved participants' financial literacy. The pre-test revealed gaps in participants' knowledge of foundational financial concepts such as budgeting, prioritization, interest and investment despite participants having bank accounts. Along with improving participant knowledge of these key concepts, our intervention positively impacted attitudes towards financial planning, including a willingness to adopt systematic saving and investing practices. The intervention also alleviated mistrust in the banking system and educated participants on scam identification and prevention.

4.2 Role of the Intervention Design

4.2.1 Comprehension of the content and format. Table 3 shows module-wise mean comprehension scores and the total mean comprehension score. A mean score of 82.5% validated the effectiveness of the story-based format of the modules along with the crowdwork-like delivery of the stories—presented one sentence at a time, to be read around and recorded. The high comprehension score also indicates that participants were able to understand the information being presented while paying attention to carefully recording each sentence.

Participants scored the highest comprehension score, 95.5%, in "Borrowing," the last module, and lowest, 67.6%, in "Needs vs. Wants," the second module. This shift suggests an improvement in comprehension, possibly due to increased familiarity and comfort with the medium as they engaged in more tasks.

Overall, the story-based format, straightforward language, familiar context, and relatable characters enabled engagement and

Table 3: Comprehension test scores: Overall and Module-wise

#	Section Name (English)	Comprehension	
		Mean	SD
1	Financial Planning and Saving	79.3	24.0
2	Needs vs. Wants	67.6	28.9
3	Budgeting	91.9	16.5
4	What is Banking?	72.1	24.2
5	Opening a bank account	91.9	18.3
6	How to manage and access money	86.0	16.0
7	Investments	73.0	27.0
8	UPI	85.6	23.0
9	Borrowing	95.5	11.6
Total	**All Sections**	**82.5**	**10.0**

better content comprehension. Our qualitative findings corroborate this.

Participants could relate to the characters and the context described in the story. For instance, P3 described their experience: *"I liked Kala and Kalpesh. Like me, they did not have any knowledge. Rama and Ramesh already had financial knowledge, and I liked how they shared their knowledge with Kala and Kalpesh,"*. Another participant, P11, found the characters related and their story inspirational, *"I liked the story of Rama and Kala. They felt like people we knew. I thought if Kala could make a big business even though she started so small, maybe I can too"*.

The simple language in the stories made them easy to understand, and previous chapter summaries provided at the beginning of each chapter helped participants recall the developments in the story and the concepts they had learnt. P7 expressed this, *"I really liked it a lot because it was very easy. It was in basic Marathi, not with complicated words and every chapter had a summary of the previous chapter. This made it really easy for me to remember things."*

The colloquial nature of the language also helped participants relate to the language used. An elderly participant, P10, noted that the dialogue in the story was fun for them to read aloud, *"Rama and Kala spoke just like us! When we talk to each other, this is how we usually speak. I had fun doing the recordings, and my grandkids had fun listening to me act out the characters of Rama and Kala"*.

Comprehension quizzes and the post-test also promoted learning. Quizzes prompted retention. P4 described their "revision" strategy: "I re-read the chapter and answered the quiz questions. This helped me learn." Anticipation of the post-test motivated note-taking. P6 said, *"I took notes for the final exam. Now I can share these notes."* P7 saved recordings for review: "I recorded on another phone to review later and answer the post-test questions correctly."

Along with the content of the chapters, the comprehension quizzes and the post-test also played a part in promoting learning. Quizzes prompted and motivated participants to retain information. P4 described their "revision" process, saying, "I revised the chapter by reading all the sentences again, and then gave answers to the questions in the 'small test'(comprehension quiz). That's how I got to learn". The anticipation of the post-test also motivated participants to retain what they had learned. P6 took notes in preparation for the 'final exam', *"I thought that the exam at the end would have questions about all this, so I took some notes in all the chapters about what I like. I have those notes. Now I can share those notes with someone else, and they will also be able to learn"*.

4.2.2 Flexibility of work and learning. The design of the platform, along with the curriculum, also played an important role in promoting learning. The platform allowed participants to work remotely and follow their own pace to learn and complete the tasks. While we set a deadline for completing all modules, participants had 13-15 days to finish the work. They could complete all modules in a few days or use the entire time available.

On average, participants took 7 days and 6 hours (174.4 hours) to complete all nine modules, with 14 days being the maximum time taken by some and one day being the least. Figure 4 shows the average time to complete each module. Participants took approximately 2 days and 9 hours to finish the first module. On average, they submitted recordings lasting 9.08 minutes for the first module. The remaining time was likely used to familiarize themselves with the platform and get used to balancing between clear recording and content comprehension. Participants may have also used this time to identify optimal times to complete tasks, fitting them into their daily schedules. As participants became more accustomed to the platform and tasks, the time required decreased; by the 9th module, they spent only about 4.7 hours to complete a module.

Figure 5 highlights the flexible nature of the work by showing the difference in active work hours between men and women. The x-axis shows the hour of the day, while the y-axis shows the median number of tasks done in a particular hour. The graph is divided into early morning, late morning, afternoon, evening and night.

Men had periods of relative inactivity in the afternoons and spikes in productivity around dawn, noon, 5 p.m. and midnight. They also had almost no activity after midnight until 5 am early morning. Conversely, women worked through the night and had a consistent productivity spike in the afternoons.

As this intervention was designed to allow participants to follow a 'work when you can, where you can' model, the participants seemed to be more receptive to it. This flexibility in terms of time and place of work allowed them to complete the tasks without fear of this work eating into their personal or work schedules. P13 candidly captured this, "*I worked in the morning. Sometimes, I worked at 11 at night. Sometimes, I worked while cooking. It was also easy to work when the children went to play downstairs and I was alone at home.*" While a young participant, P8, found it to be an easy and worthwhile way to spend their free time, remarking, *"It takes 15-20 minutes to complete a chapter. Anyway, time gets wasted every day, so instead of wasting time after college around 3-4 pm I liked doing this work and learning instead."*

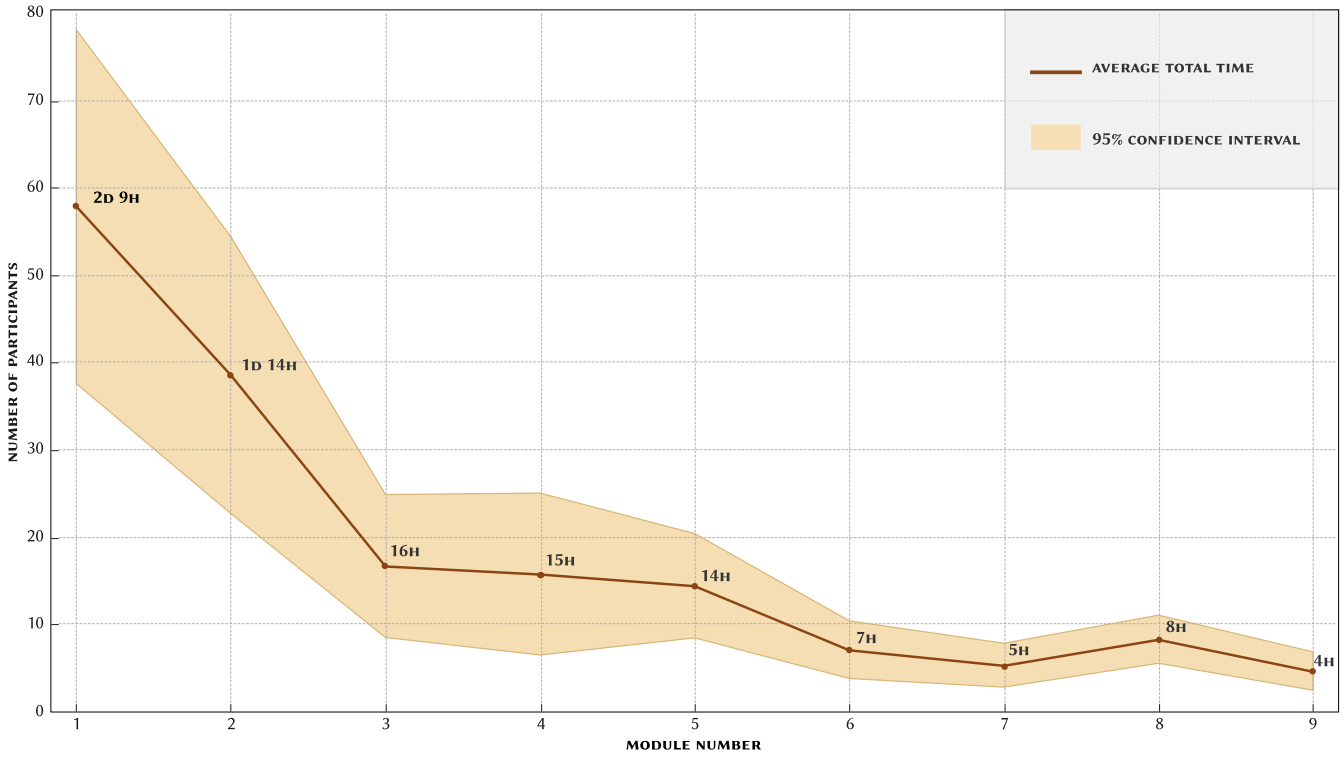

Figure 4: Time taken to complete each module (1-9) with a shaded 95% Confidence Interval.

The flexibility of time of work proved beneficial for P2, who worked a night shift, *"I worked after returning from my shift around 12 am, so did my brother. After we were done, we would discuss our learnings with each other."* On the other hand, the flexibility of the place of work was an imperative feature for P12, a new parent who had to leave their teaching job to take care of their child, *"I haven't been able to get back to my job, but I could do this work at home, that was very helpful."*.

In summary, the intervention design proved effective in promoting learning. High comprehension scores validate the utility of the story-based format and confirm the efficacy of crowd-work-like delivery. The platforms' flexibility accommodated varying paces of work and learning, allowing participants to work according to their schedules and locations. Overall, this adaptability enabled participants to integrate the work into their lifestyles, resulting in positive engagement and learning outcomes.

4.3 Emergent Behaviours

In this section, we explore the unanticipated yet constructive behaviours that arose among participants as a result of the intervention. We focus on three main subdomains: Knowledge Sharing, Peer Support, and Indications of Behaviour Change. These emergent behaviours not only enriched participants' understanding but also added a social dimension to the program by facilitating community engagement. The evidence suggests a cascading impact, extending the program's reach and reinforcing its objectives.

4.3.1 Knowledge Sharing. Family Discussions. Many participants came from joint-family households and often shared their learnings with family members. One participant, P1, described how they encouraged their mother to plan for future needs, *"I told her that if she plans properly, the savings can help us if we have an accident or for our[their and their sibling's] further education. It can also help us when we are in a critical condition. We have our money, we won't need to ask anyone else"*. P8, on the other hand, described how they shared information with their illiterate relatives, *"They can't read and couldn't take part. But I told them how to save money and use Google Pay (A popular UPI application)"*.

The story format also made it easier for participants to share knowledge with their family members, as they could use instances in the story as effective examples to explain financial concepts. P4 described this as such: *"I told them about the chapter I had recorded that day. About how there were two sisters who helped each other, how the older one taught the younger sister how to do financial saving and how to avoid unnecessary spending, how we can keep records of spendings [...]"* While P7 explained how the story format enabled her to convince her husband to listen to the recordings. She said, *"I always tell him about savings, but this time, it was like a story! So I was able to make him listen to the recordings."*

Knowledge sharing with children. Many female participants reported that their children often sat beside them as they read the stories out loud. This led to an indirect effect of children learning financial concepts by listening to these stories. P7 described this experience: *"I have two daughters; one is in 4th grade, and one is still small. They*

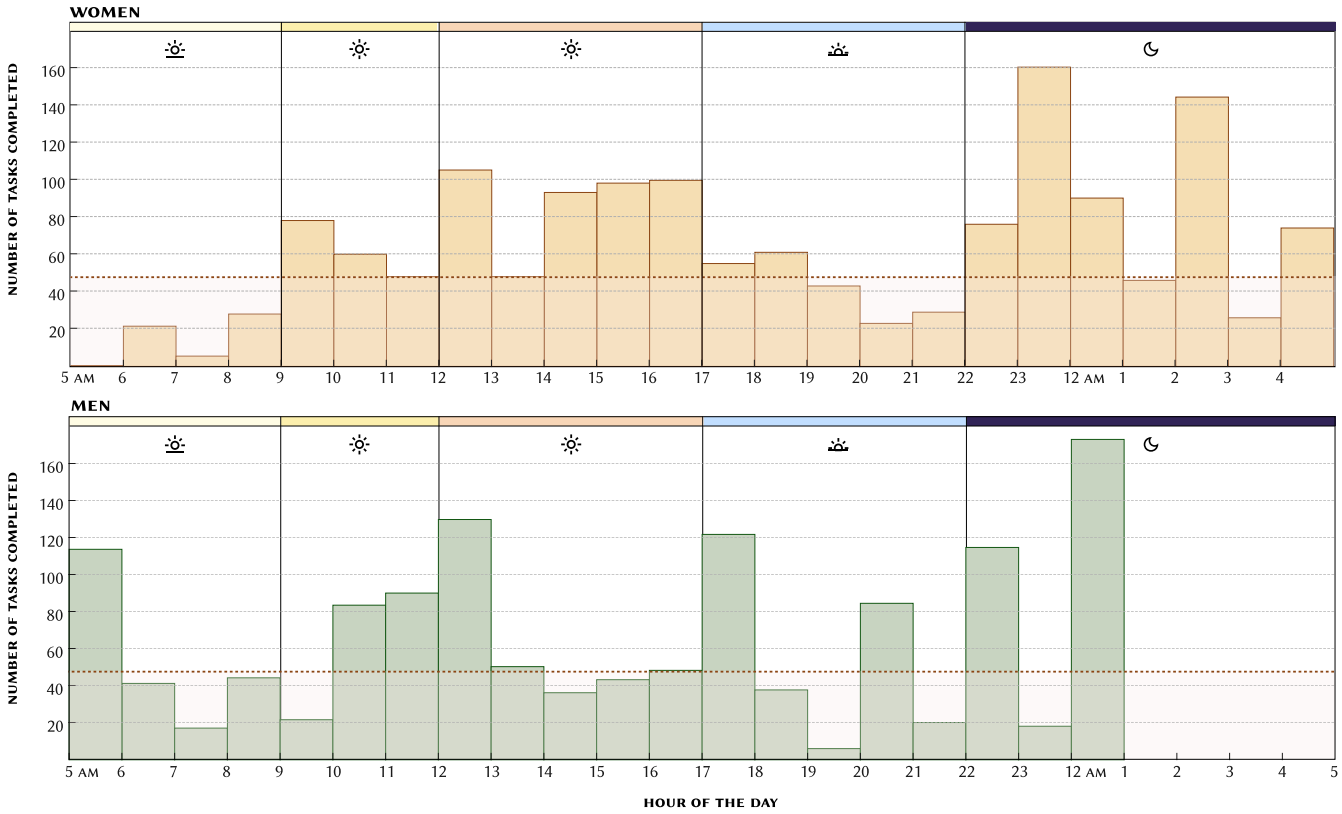

Figure 5: Comparsion between the active working hours of men and women

both used to sit next to me and listen when I read aloud the chapters." She reported how surprisingly quickly her elder daughter could grasp financial concepts and remember the details of the stories, *"My elder daughter learned how to do savings and how to use UPI just by listening to me when I was reading aloud! She could also remember the contents of a welcome kit that we get when we open a bank account!"*

Participants with older children reported that their children took an interest in the stories and reminded them to complete the tasks. P12 mentioned how their teenage daughter motivated them, *"My daughter supported me a lot. She told me to keep my other work aside and do my tasks because I was getting good information. It felt very nice; usually, I tell her to study, but now she told me to study."*

Discussing learnings with loved ones helped participants further solidify their learnings. It also helped the knowledge of the program reach community members who otherwise wouldn't have been able to participate in the program. These interactions added a rather unintended but desirable social dimension to the intervention.

4.3.2 Peer Support. We found that intervention led to the development of peer support within the participant community. Several participants reported motivating each other on common WhatsApp groups, with P7 sharing, *"We messaged on the SHG (self-help group) WhatsApp group about the tasks and chapters we had completed. We reminded each other to complete the tasks"*. P3 had a similar experience with their sibling who was also part of the program, reporting, *"Twice they finished the chapter before me. They told me to finish it because they knew I was lagging behind. That helped me to complete all the tasks."* P1 also excitedly mentioned how checking the progress of their family members and friends became an enjoyable activity for them, *"I used to ask them if they had completed the tasks. It became like a competition. We used to say, "What did you learn today?" or " I have solved all these questions", "How much did you get right? I got only one wrong!". It was fun!"*

This kind of community interaction also helped participants increase their level of comfort with the medium and navigate technical issues better. P4 reported how she formed such a community with four other participants who lived close by, sharing, *"Sometimes I used to do recording, but it wouldn't work. I would play it back to check, and there would be no recording. I asked these four people, and they said that when they faced a similar issue, they would shut the app and then open it again or switch the mobile phone off and on. That solved my issue"*. An elderly participant, P13, who was not comfortable with mobile interfaces, shared how a neighbour, also enrolled in the program, helped them understand the tasks, *"I don't know much about using mobiles, I only use it to make calls usually. The first time I tried to do the task, I couldn't figure it out at all. I went to P10, and when they pressed a button, everything started working. They told me, "I'll help you whenever you're stuck, don't give up; we*

only learn when we try". So I went back to them twice or thrice. Then I was able to do it myself."

4.3.3 Indications of Behaviour Change. As participants gained financial knowledge, they took steps to change their financial behaviours and began to have aspirations of more financially stable futures. Some participants planned to make changes in the near future, while others had already made small changes over the duration of the study.

Aspirations. It was evident from participants' responses that they were inspired by the story and had gained confidence in their ability to save and facilitate upward financial mobility for themselves. Sharing the aspirations they had developed over the course of the program, P12 said, *"Now that I have got the money from this course, I want to put it in a savings account!"*. Many participants found the story of Rama and Kala's small business inspiring and echoed similar aspirations. P5 shared, *"I understood that we can work and save money. It also made me realise that we can even start a small business."* Echoing this, P6 said, *"I knew a little bit [about saving]. But it was a small saving. Now I know how to save bigger amounts. I also know how we can get loans from banks and use that to start a business. It is my aim to start a business now, I will keep in mind that I can take a loan only from the bank to do that."*

Planned Changes. Many participants expressed a desire to change the way they managed their finances. One participant, P1, was especially inspired by the program and reported, *"I will try doing something new financially. I am going to open a bank account in the next 2 - 3 days. Even earlier, I wanted to, but I never got around to doing it. Now I feel like it is a must-do activity."* They also said, *"I am planning to change things. I used to never really think about whether my expenditure was necessary or not. From now on, when I feel that I don't need something, I will not buy it, or at least postpone the expenditure, if I can. This kind of saving will help me in the future."* P5 changed her stance, saying, "I learnt how we can do transactions through UPI. I didn't have it till now, but I feel like we should have it. I will get a UPI ID."

On a familial level, we found that the discussion of the story led to partners and families jointly planning changes to their finances. One participant, P5, three of whose family members were also a part of the study, revealed, *"We used to all do the recordings simultaneously. We would do them separately in different parts of the house, and then discuss them over dinner. Things like: How banks work; What happens if we save money; What RDs and FDs are etc. After discussing, all four of us have decided to make an RD"*. To do this, they soon planned to start saving, *"I have decided that I will save 100 Rupees daily minimum at least."*

Changes Already Implemented. We found that a number of the participants had already implemented small changes to their financial habits, with a 19-year-old P8 reporting, *"I have brought a piggy bank. I put my money in it every day"*. Other older participants also reported similarly; P3 saved as and when they could, sharing, *"I have already started saving. Two days ago, I was able to save Rs. 500, sometimes Rs. 50, other times Rs. 100"*, and P5 was able to save a small lump sum, *"I couldn't save every day, but I tried to do it as and when I could, and I saved 300-400 Rupees in total."*

Participants also reported a change in their behaviors surrounding expenditure. P8 proudly said, *"I used to go to college by bus or rickshaw. It took me 15 minutes to reach the class. Instead of that, I have started walking to class. It takes me a little longer, but I end up saving Rs. 30"* while P2 expressed how they started using UPI, *"Earlier, I never used to use UPI, but after starting this program, I have started using it."*

5 DATA GENERATED THROUGH THE INTERVENTION

To the best of our knowledge, previously, only two large-scale Marathi speech data collection efforts have been made [11, 16]. However, neither of these cover the financial domain. Indeed, the lack of attention received to collect and train language technology systems on financial Marathi data is reflected by the poor performance of otherwise good commercial ASR systems. The Word Error Rate (WER) of a commercial ASR is 35.1, whereas a Conformer CTC/Attention model [34] trained (details in Appendix D A.4) on all our data (after train-test split) performs much better with 1.2 WER (lower is better). While the lower WER of our ASR is a clear indication of the quality of the data generated, we also tested the efficacy of our speech generation approach manually by following these steps:

- We used a commercial ASR system to generate an average WER score for each worker.
- We then used these scores to randomly select the workers who have performed in the interquartile range (of all the workers) to make sure we get representative workers.
- Finally, we randomly selected 1000 recordings generated by these workers and manually validate these recordings.

Through our manual validation process, we found that 85% of the recordings generated were of good quality. 10% of the recordings generated were bad while the remaining 5% recordings were marked as unusable due to a technical glitch in the application used. We found the overall methodology to generate speech data to be very effective as the rate of good recordings generated in a crowdsourced setting is usually around 75-80% [11]. This is especially promising considering that the users employed to generate speech data are coming across many financial words for the first time.

Further, with the intent being for participants to focus on learning while recording rather than to generate good quality data, there could have been a trade-off where the data quality was compromised for the sake of learning. However, the positive results of our data quality estimation validate that it is indeed possible to generate good data while keep the focus on learning.

6 DISCUSSION

6.1 Integrating learning and upskilling in crowdwork.

6.1.1 Learning makes crowdwork more meaningful. Our intervention reframed workers as learners. This change in framing is a shift from traditional models of crowd work where workers are viewed primarily as labour for generating data, and any learning that happens as a consequence is incidental and self-regulated [50]. The overall structure of our intervention was fairly similar to how

crowdwork is carried out in low income Indian settings. We had a training session, smartphone-based tasks (in our case speech data generation), a deadline for completion and payment after completion [23].

However, our reframing of the worker as a learner led to a few explicit changes in the design of the crowdwork. First, the content selection and curation of the crowdwork task was intentional and its design was learner-centric. We knew from our primary research that our participants would find financial literacy concepts useful and interesting, and the curriculum was chosen as such. Along with that, the delivery was in a story based format paired with the summaries of previous chapters ensuring better engagement with and comprehension of the learning material.

Second, the comprehension quizzes and the post-test (communicated as the 'final exam') further solidified this reframing. It reminded the participants that the main objective of the work is learning and retention of concepts. The eventuality of the final exam motivated participants to understand and retain information they were reading, while the quizzes provided participants with feedback on their content understanding and retention, prompting a revision of the content when necessary.

We found these explicit learning-focused design choices made crowdwork more meaningful. Through this intervention we found that participants were able to find meaning beyond just monetary gain, with their motivation shifting from largely extrinsic to more intrinsic [60].

The read aloud nature of the tasks acted as the first trigger to initiate community interactions. Reading aloud externalised the information and data participants were engaging with, resulting in family members present around the participants finding the content intriguing. In turn, this sparked conversations amongst family members about critical financial concepts, sometimes leading to participants and their families making collective financial decisions. Along with adults, the read aloud stories sparked interest in children too and participants often engaged their children by reading the content out to them much like a story book.

Outside of familial interactions, the intervention also resulted in the formation of a community amongst the participants. Design decisions such as intentionally making the context and characters of the curriculum relatable resulted in participants using examples from the story to discuss plot points and learnings with each other. This type of mutual learning was bolstered by participants helping each other to overcome technical difficulties and motivating each other to finish the tasks. The addition of quizzes and tests within the curriculum also fostered a sense of competition and collaboration amongst participants, with participants checking on each others' progress and asking each other if they were able to answer the questions.

6.1.2 Payment remains an important motivator. One participant, P10, reported "We did it for the learning, we would've been okay with you not paying us", and while we did see a significant shift towards learning, data shows that payment was still an effective motivator and trigger for the participants to complete the work.

Figure 6 shows the number of tasks done per active participant per day over the 15 days of the program. We saw a significant increase of 3.4x in the number of daily average tasks completed by active participants on Day 14. This was the day after the first group of participants who completed all the tasks were paid, proof of which (in the form of photos of participants receiving the payment as well as confirmation of payment by messaging) was shared on all Whatsapp groups that had been created. This, and word of mouth assurance of payment from remunerated participants seemed to motivate others to complete their remaining tasks. G3 mentioned on their payday (Day 13), *"We had told everyone that we were going to get paid. Now that we have received the payment, we can tell them that yes, we received it!"*

We found that this rise may largely be due to participants only trusting the legitimacy of the intervention post proof of payment. A number of participants reported initial skepticism about the follow through of payment, which was rooted in the fact that the community had experienced financial scams in the past. Additionally, since all participants were from low-income communities, 2000 rupees was a significant amount for them, and they found it hard to believe that they could earn this relatively large amount through non-labour intensive work. On the subject of fraud, P10 shared, *"Prior to this, a fraud happened with 'Cosmos technology'. At that time, we paid money to access the schemes, and didn't get anything back."* While P2 stated, *"We didn't find it true that we are going to get Rs. 2000 for doing this work."*

This building of trust through payment, proved to be a catalyst for more members of the community wanting to join the intervention and also prompted participants who had dropped out to want to rejoin the study.

6.1.3 Domain-specific data-based learning through crowdwork. Crowd work, such as speech data collection, largely involves doing the same repetitive task of recording read-aloud sentences. Here, we see the potential of reframing the *crowdworker* as a *learner* while still largely staying within this sequential form of crowdwork. The task in itself can remain repetitive, while the novelty and learning can come from the content of the text being read aloud. Our study demonstrates that, at least in the domain of speech data collection, interesting and useful content paired with formative testing was able to make crowdwork a source for learning.

As discussed before, learning through crowdwork can come in many forms [25, 30, 47, 62, 73]. Platforms like duolingo, while also reframing crowdworkers as learners, have the aim of making those learners better crowdworkers for the primary crowd-sourced task of translation [73]. Our approach differs here, as our aim is to help crowdworkers gain knowledge and upskill in domains that could enable their development, financially and socially, rather than make them better at the tasks they are likely to be assigned.

Additionally, low income Indians are globally one of the most overworked individuals, with little time for activities such as learning and upskilling due to an immediate need to make a living [38]. Integrating learning with crowdwork provides a promise to bridge this gap, where low income individuals can learn while not missing out on earning a living while doing so.

We imagine a paradigm of crowdwork where careful curation and design of the data that is supposed to be annotated can make crowdwork more meaningful and educational for the workers. While this data was limited to financial literacy stories in our study, a similar approach could be replicated in several domains. Participants

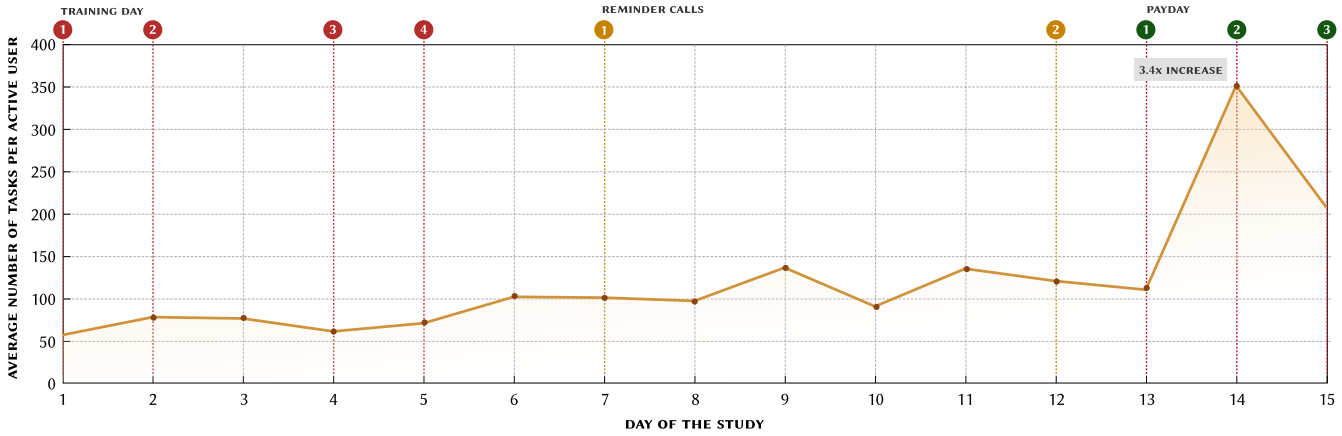

Figure 6: Average number of tasks done by active users through the 15 days of the program, with important events (Training Days, Reminder Calls and Paydays) marked

showed interest in participating in a similar study where they engaged in domains such as personal development, communication, starting a business, health, sex education and prevention of sexual misconduct for children and adults.

Traditionally, speech data collection has used generally available uncurated text content from newspaper articles, Wikipedia pages etc [13, 26, 57]. Recent studies have used domain-specific source text data for speech data generation [63]. In the future, we believe in developing tools that use automatic and human-in-the-loop methods to transform domain-specific data into lessons (story-based or theoretical). When paired with formative and summative testing methods, like those used in our study, this curriculum can be provided to crowdworkers for annotation. We believe that developing approaches like these can make crowdwork more meaningful and educational for workers.

6.2 Considerations for Scalability.

6.2.1 Platform and Technical Infrastructure. The version of the Karya app used for the study was still in development; it had its set of bugs and limitations. We faced compatibility issues for devices with Android versions below Android 7, forcing us to not consider participants with older smartphones for the study.

The application also faced issues in storing the data with a portion of the recorded files getting corrupted. This resulted in users facing playback issues while listening to their recordings. This also increased the number of corrupted recordings in our data, possibly increasing the word error rate.

Users often needed technical support to get their app working and resume the task, halting their progress and decreasing their motivation to complete the study. Future iterations of the study would need to ensure a more robust platform, technical infrastructure and rigorous testing before deployment.

Additionally, automated quality testing of recordings and reassignment of tasks with bad recording quality would ensure the generation of a more robust dataset.

6.2.2 Payment Schedule. The significant uptick in task completion post proof of payment to other participants was a clear indicator that a staggered payment method instead of a lump sum at the end of the study could have increased the participants' motivation to complete the modules.

Future iterations of this study should follow a payment structure in which participants are paid partially after reaching key milestones in the modules. This method of payment is also likely to increase participants' trust towards the platform and the researchers in the field.

Subsequent formats of this intervention could also explore adding bonus payments for achieving higher test scores. This could result in increased motivation to engage with the intervention.

6.2.3 Scaling the Generated Dataset. We asked participants to record 898 unique sentences, which is rather low for a data set that could be used to train large-scale ASR models. Two approaches to scale the number of unique sentences in the generated data set could be: (1) Augmenting the initial text data to be annotated by syntactic variation through rephrasing content and changing specific parts of the content such as names, places and examples used in the story. (2) Employing within-study participants to annotate the open-ended speech data generated by other participants, like the one generated through the open-ended comprehension questions. This would ensure that any ASR system trained on such domain-specific data set benefits from adding open-ended speech data while also adding more unique sentences to the data set.

6.2.4 Scaling training and support. If such an intervention was to be deployed to a larger number of participants, the personalised nature of the training methods and reminder calls employed in this study would not be feasible. Larger studies would benefit from technological solutions for training and support, such as video-based training, automated support and push notifications to nudge participants to complete tasks regularly.

With these considerations in mind, such an intervention shows the potential of becoming a sustainable and scalable methodology for knowledge dissemination through crowdwork.

6.3 Limitations

This study has limitations worth noting. First, the absence of a control group or other treatment groups prevents robust comparison. A randomized control trial could validate our results more effectively.

Second, the study focuses on a specific geographic area within a single state in India. This scope restricts the generalizability of our findings.

Third, the success of the study is tied to the participants' interest in financial literacy. The approach might not be as effective if the content does not engage participants. This remains untested.

7 CONCLUSION

We conducted a concurrent convergent mixed methods study with 37 participants. The study involved the participants performing speech data generation tasks on the Karya platform by reading aloud a specifically designed financial literacy curriculum sentence by sentence. The participants also engaged in pre-post testing and in-subject quizzes as a part of the curriculum. Analysis of the test scores and subsequent interviews with 14 participants gave us insights into whether crowdwork tasks can become successful conduits for knowledge dissemination.

Overall, the findings from this study affirm the utilization of digital work in disseminating informative content to low-income individuals. Offering them opportunities for skill development and financial growth, while simultaneously providing them access to dignified earning. The success of this research project gives us confidence in scaling up our efforts to reach more communities and to cover several other domains of knowledge dissemination.

REFERENCES

[1] [n. d.]. ASER 2022 - ASER: Annual Status of Education Report. https://asercentre.org/aser-2022/. (Accessed on 09/13/2023).

[2] [n. d.]. Evaluating the Effectiveness of a Financial Literacy Program in South Africa | The Abdul Latif Jameel Poverty Action Lab. https://www.povertyactionlab.org/evaluation/evaluating-effectiveness-financial-literacy-program-south-africa?lang=en. (Accessed on 09/13/2023).

[3] [n. d.]. FETP - National Centre for Financial Education (NCFE). https://www.ncfe.org.in/program/fetp. (Accessed on 09/13/2023).

[4] [n. d.]. Karya. https://www.karya.in/. (Accessed on 09/13/2023).

[5] [n. d.]. OECD Legal Instruments. https://legalinstruments.oecd.org/en/instruments/OECD-LEGAL-0461. (Accessed on 09/13/2023).

[6] [n. d.]. Parinaam - Parinaam Foundation. https://www.parinaam.org/. (Accessed on 09/13/2023).

[7] [n. d.]. .::Santulan::. http://santulan.org/index.asp. (Accessed on 09/13/2023).

[8] [n. d.]. S&P Global FinLit Survey | Global Financial Literacy Excellence Center (GFLEC). https://gflec.org/initiatives/sp-global-finlit-survey/. (Accessed on 09/13/2023).

[9] [n. d.]. Ujjivan. https://www.ujjivan.com/. (Accessed on 09/13/2023).

[10] [n. d.]. Welcome to RBI Financial. https://www.rbi.org.in/FinancialEducation/Home.aspx. (Accessed on 09/13/2023).

[11] Basil Abraham, Danish Goel, Divya Siddarth, Kalika Bali, Manu Chopra, Monojit Choudhury, Pratik Joshi, Preethi Jyoti, Sunayana Sitaram, and Vivek Seshadri. 2020. Crowdsourcing Speech Data for Low-Resource Languages from Low-Income Workers. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*. European Language Resources Association, Marseille, France, 2819–2826. https://aclanthology.org/2020.lrec-1.343

[12] Antonella De Angeli, Uday Athavankar, Anirudha Joshi, Lynne Coventry, and Graham I. Johnson. 2004. Introducing ATMs in India: a contextual inquiry. *Interacting with Computers* 16, 1 (2004), 29–44. https://doi.org/10.1016/J.INTCOM.2003.11.003

[13] Rosana Ardila, Megan Branson, Kelly Davis, Michael Kohler, Josh Meyer, Michael Henretty, Reuben Morais, Lindsay Saunders, Francis Tyers, and Gregor Weber. 2020. Common Voice: A Massively-Multilingual Speech Corpus. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*. European Language Resources Association, Marseille, France, 4218–4222. https://aclanthology.org/2020.lrec-1.520

[14] Kriss Barker. 2007. Sex, Soap and Social Change – The Sabido Methodology. *AIDSLINK* (July 2007). Issue 104.

[15] Jere R Behrman, Olivia S Mitchell, Cindy Soo, and David Bravo. 2010. *Financial Literacy, Schooling, and Wealth Accumulation.* Technical Report 16452. National Bureau of Economic Research. https://doi.org/10.3386/w16452

[16] Kaushal Bhogale, Abhigyan Raman, Tahir Javed, Sumanth Doddapaneni, Anoop Kunchukuttan, Pratyush Kumar, and Mitesh M. Khapra. 2023. Effectiveness of Mining Audio and Text Pairs from Public Data for Improving ASR Systems for Low-Resource Languages. In *ICASSP 2023 - 2023 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. 1–5. https://doi.org/10.1109/ICASSP49357.2023.10096933

[17] Jeffrey P. Bigham, Kristin Williams, Nila Banerjee, and John Zimmerman. 2017. Scopist: Building a Skill Ladder into Crowd Transcription. In *Proceedings of the 14th International Web for All Conference* (Perth, Western Australia, Australia) *(W4A '17)*. Association for Computing Machinery, New York, NY, USA, Article 2, 10 pages. https://doi.org/10.1145/3058555.3058562

[18] Virginia Braun and Victoria Clarke. 2006. Using thematic analysis in psychology. *Qualitative Research in Psychology* 3, 2 (2006), 77–101.

[19] Robin Brewer, Meredith Ringel Morris, and Anne Marie Piper. 2016. "Why Would Anybody Do This?": Understanding Older Adults' Motivations and Challenges in Crowd Work *(CHI '16)*. Association for Computing Machinery, New York, NY, USA, 2246–2257. https://doi.org/10.1145/2858036.2858198

[20] Population Media Center. 2005. *Soap Operas for Social Change to Prevent HIV/AIDS: A Training Guide for Journalists and Media Personnel.* Population Media Center (PMC), P.O. Box 547, Shelburne, Vermont 05482, USA. www.populationmedia.org Designed by: Shawn Braley, Printed in USA by Leahy Press.

[21] Chun-Wei Chiang, Anna Kasunic, and Saiph Savage. 2018. Crowd Coach. *Proceedings of the ACM on Human-Computer Interaction* 2 (2018), 1–17. https://api.semanticscholar.org/CorpusID:251648141

[22] Anna Choi, Derek Stoutland, and Luisa Blanco. 2023. An evaluation of a digital financial education program and the impact of COVID-19 on financial well-being among college students. *Journal of American College Health* 0, 0 (2023), 1–13.

[23] Manu Chopra, Indrani Medhi Thies, Joyojeet Pal, Colin Scott, William Thies, and Vivek Seshadri. 2019. Exploring Crowdsourced Work in Low-Resource Settings. In *Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (Glasgow, Scotland Uk) *(CHI '19)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3290605.3300611

[24] J.W. Creswell and V.L.P. Clark. 2017. *Designing and Conducting Mixed Methods Research.* SAGE Publications. https://books.google.co.in/books?id=eTwmDwAAQBAJ

[25] Gabriel Culbertson, Solace Shen, Erik Andersen, and Malte Jung. 2017. Have Your Cake and Eat It Too: Foreign Language Learning with a Crowdsourced Video Captioning System. In *Proceedings of the 2017 ACM Conference on Computer Supported Cooperative Work and Social Computing* (Portland, Oregon, USA) *(CSCW '17)*. Association for Computing Machinery, New York, NY, USA, 286–296. https://doi.org/10.1145/2998181.2998268

[26] Barsha Deka, Joyshree Chakraborty, Abhishek Dey, Shikhamoni Nath, Priyankoo Sarmah, S. R. Nirmala, and K. Samudravijaya. 2018. Speech Corpora of Under Resourced Languages of North-East India. *2018 Oriental COCOSDA - International Conference on Speech Database and Assessments* (2018), 72–77. https://api.semanticscholar.org/CorpusID:122344153

[27] Djellel Difallah, Elena Filatova, and Panos Ipeirotis. [n. d.]. Mechanical Turk Surveys. https://demographics.mturk-tracker.com/. (Accessed on 09/11/2023).

[28] Djellel Difallah, Elena Filatova, and Panos Ipeirotis. 2018. Demographics and Dynamics of Mechanical Turk Workers *(WSDM '18)*. Association for Computing Machinery, New York, NY, USA, 135–143. https://doi.org/10.1145/3159652.3159661

[29] Ariel Fiszbein, Norbert Schady, Francisco H.G. Ferreira, Margaret Grosh, Niall Keleher, Pedro Olinto, and Emmanuel Skoufias. 2009. *Conditional Cash Transfers : Reducing Present and Future Poverty.* World Bank, Washington, DC. http://hdl.handle.net/10986/2597 License: CC BY 3.0 IGO.

[30] Ujwal Gadiraju, Besnik Fetahu, and Ricardo Kawase. 2015. Training Workers for Improving Performance in Crowdsourcing Microtasks. In *European Conference on Technology Enhanced Learning*. https://api.semanticscholar.org/CorpusID:20260785

[31] Anja Gaentzsch. 2020. Do conditional cash transfers (CCTs) raise educational attainment? An impact evaluation of Juntos in Peru. *Development Policy Review* 38 (2020), 747–765.

[32] Andrew Gill and Radha Bhattacharya. 2019. The effects of a financial literacy intervention on the financial and economic knowledge of high school students. *The Journal of Economic Education* 50, 3 (2019), 215–229.

[33] Antonia Grohmann, Theres Klühs, and Lukas Menkhoff. 2018. Does financial literacy improve financial inclusion? Cross country evidence. *World Development* 111 (2018), 84–96.

[34] Anmol Gulati, Chung-Cheng Chiu, James Qin, Jiahui Yu, Niki Parmar, Ruoming Pang, Shibo Wang, Wei Han, Yonghui Wu, Yu Zhang, and Zhengdong Zhang (Eds.). 2020. *Conformer: Convolution-augmented Transformer for Speech Recognition.*

[35] Aakar Gupta, William Thies, Edward Cutrell, and Ravin Balakrishnan. 2012. MClerk: Enabling Mobile Crowdsourcing in Developing Regions. In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (Austin, Texas, USA) *(CHI '12)*. Association for Computing Machinery, New York, NY, USA, 1843–1852. https://doi.org/10.1145/2207676.2208320

[36] Aakar Gupta, William Thies, Edward Cutrell, and Ravin Balakrishnan. 2012. MClerk: Enabling Mobile Crowdsourcing in Developing Regions *(CHI '12)*. Association for Computing Machinery, New York, NY, USA, 1843–1852. https://doi.org/10.1145/2207676.2208320

[37] MICHAL ICHT and YANIV MAMA. 2015. The production effect in memory: a prominent mnemonic in children. *Journal of Child Language* 42, 5 (2015), 1102–1124. https://doi.org/10.1017/S0305000914000713

[38] International Labour Office. 2020. *Global Wage Report 2020–21: Wages and minimum wages in the time of COVID-19*. ILO (International Labour Office), Geneva. (Accessed on 09/14/2023).

[39] Pratik Joshi, Christain Barnes, Sebastin Santy, Simran Khanuja, Sanket Shah, Anirudh Srinivasan, Satwik Bhattamishra, Sunayana Sitaram, Monojit Choudhury, and Kalika Bali. 2019. Unsung Challenges of Building and Deploying Language Technologies for Low Resource Language Communities. In *Proceedings of the 16th International Conference on Natural Language Processing*. NLP Association of India, International Institute of Information Technology, Hyderabad, India, 211–219. https://aclanthology.org/2019.icon-1.25

[40] Pratik Joshi, Sebastin Santy, Amar Budhiraja, Kalika Bali, and Monojit Choudhury. 2020. The State and Fate of Linguistic Diversity and Inclusion in the NLP World. In *Proceedings of the 58th Annual Meeting of the Association for Computational Linguistics*. Association for Computational Linguistics, Online, 6282–6293. https://doi.org/10.18653/v1/2020.acl-main.560

[41] Anjuli Kannan, Yonnghui Wu, Patrick Nguyen, Tara N. Sainath, Zhifeng Chen, and Rohit Prabhavalkar. 2018. An Analysis of Incorporating an External Language Model into a Sequence-to-Sequence Model. *ICASSP* (2018).

[42] Suyoun Kim, Takaaki Hori, and Shinji Watanabe. 2017. Joint CTC-attention based end-to-end speech recognition using multi-task learning. *2017 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)* (2017), 4835–4839.

[43] Aniket Kittur, Jeffrey V. Nickerson, Michael Bernstein, Elizabeth Gerber, Aaron Shaw, John Zimmerman, Matt Lease, and John Horton. 2013. The Future of Crowd Work. In *Proceedings of the 2013 Conference on Computer Supported Cooperative Work* (San Antonio, Texas, USA) *(CSCW '13)*. Association for Computing Machinery, New York, NY, USA, 1301–1318. https://doi.org/10.1145/2441776.2441923

[44] Leora Klapper, Annamaria Lusardi, and Georgios A. Panos. 2013. Financial literacy and its consequences: Evidence from Russia during the financial crisis. *Journal of Banking & Finance* 37, 10 (2013), 3904–3923. https://doi.org/10.1016/j.jbankfin.2013.07.014

[45] Siou Chew Kuek, Cecilia Paradi-Guilford, Toks Fayomi, Saori Imaizumi, and Panagiotis G. Ipeirotis. 2015. The Global Opportunity in Online Outsourcing. https://api.semanticscholar.org/CorpusID:166355619

[46] Shreya Lahiri and Shreya Biswas. 2022. Does financial literacy improve financial behavior in emerging economies? Evidence from India. *Managerial Finance* 48, 9/10 (2022), 1430–1452.

[47] Doris Jung-Lin Lee, Joanne Lo, Moonhyok Kim, and Eric Paulos. 2016. Crowdclass: Designing Classification-Based Citizen Science Learning Modules. *Proceedings of the AAAI Conference on Human Computation and Crowdsourcing* 4, 1 (Sep. 2016), 109–118.

[48] Chris Madge, Jussi Brightmore, Doruk Kicikoglu, Fatima Althani, Richard Bartle, Jon Chamberlain, Udo Kruschwitz, and Massimo Poesio. 2022. LingoTowns: A Virtual World For Natural Language Annotation and Language Learning. In *Extended Abstracts of the 2022 Annual Symposium on Computer-Human Interaction in Play* (Bremen, Germany) *(CHI PLAY '22)*. Association for Computing Machinery, New York, NY, USA, 57–62. https://doi.org/10.1145/3505270.3558323

[49] Sue Maguire. 2008. Paying young people to learn – does it work? 1. *Research in Post-Compulsory Education* 13 (2008), 205–215. https://api.semanticscholar.org/CorpusID:144482028

[50] Anoush Margaryan. 2016. Understanding crowdworkers' learning practices. https://api.semanticscholar.org/CorpusID:150612773

[51] Anoush Margaryan. 2019. Comparing crowdworkers' and conventional knowledge workers' self-regulated learning strategies in the workplace. *Hum. Comput.* 6 (2019), 83–97. https://api.semanticscholar.org/CorpusID:169180527

[52] Devansh Mehta, Sebastin Santy, Ramaravind Kommiya Mothilal, Brij Mohan Lal Srivastava, Alok Sharma, Anurag Shukla, Vishnu Prasad, Venkanna U, Amit Sharma, and Kalika Bali. 2020. Learnings from Technological Interventions in a Low Resource Language: A Case-Study on Gondi. In *Proceedings of the Twelfth Language Resources and Evaluation Conference*. European Language Resources Association, Marseille, France, 2832–2838. https://aclanthology.org/2020.lrec-1.345

[53] Takumi Nakayama, Masaki Matsubara, and Atsuyuki Morishima. 2021. Crowd-Worker Skill Improvement with AI Co-Learners. *Proceedings of the 9th International Conference on Human-Agent Interaction* (2021). https://api.semanticscholar.org/CorpusID:243864741

[54] H. Nariman. 1993. *Soap Operas for Social Change: Toward a Methodology for Entertainment-Education Television*. Bloomsbury Academic. https://books.google.co.in/books?id=wc1kAAAAMAAJ

[55] Ministry of Housing and Government of India Urban Poverty Alleviation. 2017 (updated). Pradhan Mantri Awas Yojana (Urban) – Housing for All Credit Linked Subsidy Scheme for EWS/LIG: Operational Guidelines. https://mohua.gov.in/upload/uploadfiles/files/5CLSS_EWS_LIG_English_Guidelines_wb.pdf. (Accessed on 09/12/2023).

[56] Jason D. Ozubko, Kathleen L. Hourihan, and Colin M. MacLeod. 2012. Production benefits learning: The production effect endures and improves memory for text. *Memory* 20, 7 (2012), 717–727.

[57] Ayushi Pandey, Brij Mohan Lal Srivastava, Rohit Kumar, Bhanu Teja Nellore, Kasi Sai Teja, and Suryakanth V. Gangashetty. 2018. Phonetically Balanced Code-Mixed Speech Corpus for Hindi-English Automatic Speech Recognition. In *Proceedings of the Eleventh International Conference on Language Resources and Evaluation (LREC 2018)*. European Language Resources Association (ELRA), Miyazaki, Japan. https://aclanthology.org/L18-1235

[58] Arvind Singhal Ramadhan M. Swalehe Peter W. Vaughan, Everett M. Rogers. 2000. Entertainment-Education and HIV/AIDS Prevention: A Field Experiment in Tanzania. *Journal of Health Communication* 5, sup1 (2000), 81–100.

[59] Meghna Ranganathan and Mylene Lagarde. 2012. Promoting healthy behaviours and improving health outcomes in low and middle income countries: A review of the impact of conditional cash transfer programmes. *Preventive Medicine* 55 (2012), S95–S105.

[60] Richard M. Ryan and Edward L. Deci. 2020. Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology* 61 (2020), 101860. https://doi.org/10.1016/j.cedpsych.2020.101860

[61] Maimoona Sadiq, Anjum Ihsan, and Amjad Hameed Khattak. 2023. Women Economic Empowerment through the Lens of Financial Inclusion in Pakistan: Analysis of the Moderation Effect of Financial Literacy. *Journal of Business and Tourism* 9, 01 (Sep. 2023), 21–36. https://doi.org/10.34260/jbt.v9i01.266

[62] Benjamin Satzger, Harald Psaier, Daniel Schall, and Schahram Dustdar. 2011. Stimulating Skill Evolution in Market-Based Crowdsourcing. In *International Conference on Business Process Management*. https://api.semanticscholar.org/CorpusID:15432063

[63] Pukhraj Shrishrimal, Ratnadeep R. Deshmukh, and Vishal B. Waghmare. 2012. Indian Language Speech Database: A Review. *International Journal of Computer Applications* 47 (2012), 17–21. https://api.semanticscholar.org/CorpusID:2809365

[64] Arvind Singhal and Everett M Rogers. 2002. A theoretical agenda for entertainment—education. *Communication theory* 12, 2 (2002), 117–135.

[65] VERBI Software. 2021. *MAXQDA 2022*. VERBI Software, Berlin, Germany. maxqda.com

[66] Saiganesh Swaminathan, Indrani Medhi Thies, Devansh Mehta, Edward Cutrell, Amit Sharma, and William Thies. 2019. Learn2Earn: Using Mobile Airtime Incentives to Bolster Public Awareness Campaigns. *Proc. ACM Hum.-Comput. Interact.* 3, CSCW, Article 49 (nov 2019), 20 pages. https://doi.org/10.1145/3359151

[67] Bill Thies, Aishwarya Ratan, and James Davis. 2011. Paid Crowdsourcing as a Vehicle for Global Development.

[68] Shubham Toshniwal, Anjuli Kannan, Chung-Cheng Chiu, Yonghui Wu, Tara N Sainath, and Karen Livescu. 2018. A Comparison of Techniques for Language Model Integration in Encoder-Decoder Speech Recognition. In *2018 IEEE Spoken Language Technology Workshop (SLT)*. 369–375. https://doi.org/10.1109/SLT.2018.8639038

[69] Aditya Vashistha, Abhinav Garg, and Richard Anderson. 2019. ReCall: Crowdsourcing on Basic Phones to Financially Sustain Voice Forums *(CHI '19)*. Association for Computing Machinery, New York, NY, USA, 1–13. https://doi.org/10.1145/3290605.3300399

[70] Aditya Vashistha, Pooja Sethi, and Richard Anderson. 2017. Respeak: A Voice-Based, Crowd-Powered Speech Transcription System. In *Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems* (Denver, Colorado, USA) *(CHI '17)*. Association for Computing Machinery, New York, NY, USA, 1855–1866. https://doi.org/10.1145/3025453.3025640

[71] Ashish Vaswani, Noam Shazeer, Niki Parmar, Jakob Uszkoreit, Llion Jones, Aidan N. Gomez, Lukasz Kaiser, and Illia Polosukhin. 2023. Attention Is All You Need. arXiv:1706.03762 [cs.CL]

[72] Elisabete Vieira. 2012. What do we know about financial literacy? A Literature review. *Marmara Journal of European Studies* 20 (01 2012), 23–38.

[73] Luis von Ahn. 2013. Duolingo: Learn a Language for Free While Helping to Translate the Web. In *Proceedings of the 2013 International Conference on Intelligent User Interfaces* (Santa Monica, California, USA) *(IUI '13)*. Association for Computing Machinery, New York, NY, USA, 1–2. https://doi.org/10.1145/2449396.2449398

[74] Nai-Ching Wang, David Hicks, and Kurt Luther. 2018. Exploring Trade-Offs Between Learning and Productivity in Crowdsourced History. *Proc. ACM Hum.-Comput. Interact.* 2, CSCW, Article 178 (nov 2018), 24 pages. https://doi.org/10.1145/3274447

[75] Shanping Wang, Peng Cao, and Shao Huang. 2022. Household financial literacy and relative poverty: An analysis of the psychology of poverty and market

participation. *Frontiers in Psychology* 13 (2022).
[76] Shinji Watanabe, Takaaki Hori, Shigeki Karita, Tomoki Hayashi, Jiro Nishitoba, Yuya Unno, Nelson Enrique Yalta Soplin, Jahn Heymann, Matthew Wiesner, Nanxin Chen, Adithya Renduchintala, and Tsubasa Ochiai. 2018. ESPnet: End-to-End Speech Processing Toolkit. In *Proceedings of Interspeech*. 2207–2211.
[77] Min Zhan, Steven Anderson, and Jeff Scott. 2006. Financial Knowledge of the Low-income Population: Effects of a Financial Education Program. *The Journal of Sociology and Social Welfare* 33 (03 2006), 53–74.
[78] Kathryn Zyskowski, Meredith Ringel Morris, Jeffrey P. Bigham, Mary L. Gray, and Shaun Kane. 2015. Accessible Crowdwork? Understanding the Value in and Challenge of Microtask Employment for People with Disabilities. In *CSCW 2015*. ACM - Association for Computing Machinery.

A APPENDIX

A.1 Appendix A: Translated (English) Pre-Post Test

(1) What is saving?
  (a) Asking your employer for more money
  (b) Setting aside money or resources for future use
  (c) Putting money in a chit fund
  (d) Buying things because they are on sale
  (e) I don't know
  Answer: B

(2) What is the goal of financial planning?
  (a) To earn a higher amount of wage than you do currently
  (b) To be able to spend your money on things you enjoy
  (c) To ensure that your money is effectively managed and used to meet your current and future needs.
  (d) To be able to take out loans to buy new things
  (e) I don't know
  Answer: C

(3) What is one benefit of financial planning for health and accidents?
  (a) It can prevent health problems and accidents from happening
  (b) It can help you avoid having to spend money on healthcare
  (c) It allows you to afford quality health care and protect you from financial hardships caused by the same.
  (d) It improves your physical fitness and well-being over time
  (e) I don't know
  Answer: C

(4) Why is it important to distinguish between needs and wants in financial planning?
  (a) To make sure you spend your money on wants.
  (b) So you can avoid spending money on anything.
  (c) To prioritize expenses and ensure essential needs are being met
  (d) So you can borrow money for non-essential wants.
  (e) I don't know
  Answer: C.

(5) Which of the following statements is true?
  (a) Dining out at restaurants is an essential need because food is an essential need.
  (b) Going on a vacation when bills are pending is an essential need.
  (c) Visiting a doctor and buying medicines given by the doctor is an essential need.
  (d) Fixing a broken roof is a non-essential want.
  (e) I don't know
  Answer: C.

(6) Why is it important to cut down on non-essential wants?
  (a) So you can spend all your money only on essential needs
  (b) To save money for long-term goals or emergencies
  (c) To keep up with your neighbours and community
  (d) So that you can borrow more money for your wants.
  (e) I don't know
  Answer: B.

(7) What is budgeting?
  (a) A way of planning for the future and saving money for sudden needs and long-term goals.
  (b) A way of spending money on your desires and wants.
  (c) A method to help you avoid saving money
  (d) A method to avoid spending any money on any expenses
  (e) I don't know
  Answer: A

(8) Why is it important to maintain a budget diary?
  (a) It helps to remember expenses
  (b) To know where money is being spent
  (c) To identify areas where expenses can be reduced
  (d) All of the above (A,B and C)
  (e) I don't know
  Answer: D

(9) How to save money for emergencies and yearly needs?
  (a) Saving a fixed amount daily and maintaining a diary of their expenses
  (b) Spending all your income on daily needs and never saving any money
  (c) Not spending money at all
  (d) By borrowing money from a moneylender
  (e) I don't know
  Answer: A

(10) Why are banks considered to be safe places to store money?
  (a) Banks have many security systems in place to ensure the safety of their customers' money.
  (b) Banks are regulated by government agencies to ensure that they are working responsibly.
  (c) Banks have various security measures in place to protect money and prevent fraud.
  (d) All of the above.
  (e) I don't know
  Answer: D.

(11) What is 'interest' provided by the bank?
  (a) A fee charged by the bank for opening an account
  (b) A reward provided by a bank for keeping the money in the bank
  (c) Money paid to the government by the bank
  (d) A penalty charged for withdrawing money from the bank
  (e) I don't know
  Answer: B

(12) What is the most important factor to consider before opening a bank account?
  (a) The color of the bank's logo
  (b) The distance between the bank and your home

(c) If the bank is recognized and regulated by RBI
(d) The number of branches the bank has
(e) I don't know
Answer: C.

(13) How can you open a savings bank account?
(a) By giving 5,000 rupees in cash to Ujjivan Bank
(b) Provide your blood type and medical history to Ujjivan Bank.
(c) Pass a written exam on banking regulations at the Ujjivan Bank.
(d) Providing your Aadhar card and a valid ID proof to the Ujjivan Bank CRO.
(e) I don't know
Answer: D

(14) What is a savings bank account?
(a) An account to lend money
(b) An account to borrow money
(c) An account to deposit small amounts and earn an interest
(d) An account to withdraw large amounts of money
(e) I don't know
Answer: C

(15) What is the most important thing to remember when taking salary payments?
(a) To make sure you take all your payments in cash
(b) Ask your employer to transfer the salary into your account or deposit cash yourself as soon as possible
(c) To not deposit the cash payment you receive as salary to your savings account
(d) To wait until the end of the month to deposit the salary payments
(e) I don't know
Answer: B.

(16) What does it mean for money to be credited in your bank account?
(a) When you withdraw money or money is taken out of your account.
(b) When you deposit money or money is added to your account
(c) When you make an online transaction
(d) When the amount of money stays constant in your account.
(e) I don't know
Answer: B

(17) Which of the following is the purpose of an ATM card?
(a) To withdraw money from any ATM
(b) To deposit money at the bank branch
(c) To update your passbook
(d) None of the above
(e) I don't know
Answer: A

(18) Which of the following is a responsibility that comes with the convenience of banking?
(a) To secure your money and documents from unknown people
(b) To share your money with people you just met
(c) To share your secret number and password with others
(d) To not talk to any unknown person you meet
(e) I don't know
Answer: A

(19) What is a fixed deposit?
(a) A type of savings account that offers a lower interest rate than a regular savings account
(b) A type of investment scheme where you deposit a certain amount of money for a fixed period of time and earn a higher interest rate than a regular savings account
(c) A type of investment scheme that doubles your money in a month
(d) A type of investment where you borrow money from a bank
(e) I don't know
Answer: B

(20) What is a recurring deposit?
(a) A type of investment where you purchase shares in a company and earn dividends
(b) A type of savings account that offers a lower interest rate than a regular savings account
(c) A type of investment scheme where you deposit a certain amount of money for a fixed period of time and earn a higher interest rate than a regular savings account
(d) A type of investment where you deposit a smaller amount of money on a regular basis and earn a higher interest rate than a regular savings account
(e) I don't know
Answer: D.

(21) What is the benefit of opening a fixed deposit or a recurring deposit?
(a) You can withdraw money at any time
(b) You can earn a higher interest rate than a regular savings account
(c) You can earn a lower interest rate than a regular savings account
(d) Your money doubles every 3 months
(e) I don't know
Answer: B.

(22) What is UPI?
(a) A way to pay money using your phone
(b) A way to pay money using cash
(c) A way to take a small loan easily
(d) A way to pay money using a cheque
(e) I don't know
Answer: A.

(23) What are the benefits of UPI?
(a) Its makes withdrawing cash from your account and giving it to someone else easy
(b) It makes depositing money into someone else's account easier and safer
(c) It helps you send money directly from your account to someone else's account
(d) It helps you take loans easily
(e) I don't know
Answer: C.

(24) How can you ensure the safety of using UPI?
(a) By not sharing your UPI pin with anyone
(b) By not using your phone to make payments

(c) By using cash instead of UPI
(d) By withdrawing cash from the bank and making payments in person
(e) I don't know
Answer: A.

(25) What is the difference between borrowing money from a bank and borrowing money from a moneylender?
(a) Banks are official and regulated, while moneylenders are not regulated
(b) Banks charge higher interest rates than moneylenders
(c) Moneylenders are safer to borrow from than banks
(d) Banks are more likely to exploit borrowers than moneylenders
(e) I don't know
Answer: A.

(26) What are some of the benefits of borrowing from a formal institution like a bank?
(a) Affordable loans, not exploitative, healthy recovering and lending practices, and safety for the borrower.
(b) High interest rates, exploitative practices, and unsafe for the borrower.
(c) No interest rates, very low fees, and quick approval.
(d) No collateral required, no need to pay the money back.
(e) I don't know
Answer: A.

(27) What is the key to achieving success with a loan?
(a) Borrowing as much money as possible
(b) Proper management and utilization of loaned funds
(c) Paying off the loan as quickly as possible
(d) Not taking any risks
(e) I don't know
Answer: B.

A.2 Appendix B: Post Module Comprehension Quizzes

Module 1: Saving and Financial Planning

(1) Who were Rama and Kala?
(a) Two sisters who worked as household help in the city.
(b) Two sisters who owned a shop in the city.
(c) Two friends who were teachers in the local primary school.
(d) Two neighbors
Answer: A

(2) Why did Rama ask Mrs Singh for advice?
(a) Rama needed help with her daily expenses.
(b) Rama wanted to inquire about school admissions for her son
(c) Rama was confused about borrowing money from a local money-lender.
(d) Rama wanted to borrow some ghee.
Answer: C

(3) What are the benefits of saving and financial planning mentioned in the text?
(a) Protection from unforeseen events, achieving long-term goals, and avoiding exploitation by moneylenders
(b) Getting deeper into debt, achieving short-term goals, and reducing the need to work
(c) Losing your savings, facing more difficulties, and having to depend on others
(d) Avoiding unforeseen events, achieving short-term goals, and earning more money
Answer: A.

Module 2: Needs vs Wants

(1) Why were Kala and Kalpesh going to visit the money lender's house?
(a) To repay their debt
(b) To borrow more money
(c) To inquire about a grooms for Rukmini
(d) To book a hall for Rukmini's wedding
Answer: B.

(2) How did Rama suggest Kala cut down on the expenses for Rukmini's wedding?
(a) Choose a simpler card design for printing
(b) Cut down on the number of dishes served at the dinner
(c) Use an open area like a temple for the venue
(d) All of the above
Answer: D

(3) What was Rama's advice to Kala about categorizing expenses?
(a) Categorize expenses as essential needs and non-essential wants
(b) Categorize expenses as expensive and inexpensive
(c) Categorize expenses as interesting and uninteresting
(d) Categorize expenses as big and small
Answer: A

Module 3: Budgeting

(1) How did Rama and Ramesh manage to save money during the pandemic?
(a) They borrowed money from friends and family
(b) They cut down their expenses by prioritizing their needs over their wants
(c) They won a lottery
(d) Took a loan from a moneylender
Answer: B

(2) How much money did Rama end up saving because of budgeting"
(a) 2000 rupees
(b) 40,000 rupees
(c) 1 lakh rupees
(d) 10,000 rupees
Answer: B

(3) How can Kala keep track of her expenses?
(a) By asking for bills and saving them in a box
(b) By maintaining a budget diary
(c) By relying on loose papers
(d) Meticulously remembering all her expenses
Answer: B

Module 4: Bank Account

(1) Why did Kala visit Rama again after two months?
(a) To ask Rama about her savings.
(b) To borrow some money.
(c) To ask Rama about how she keeps her money safe.

(d) To introduce Rama to Shruti Didi.
Answer: C

(2) How does Rama keep her savings safe?
(a) She keeps her money in a jar at home.
(b) She has a safe box in her house.
(c) She opened a savings bank account with Ujjivan Bank and deposits her savings in the bank every week.
(d) She keeps the money with her sister-in-law
Answer: C

(3) What is the role of The Reserve Bank of India (RBI)?
(a) To regulate and ensure the safety of banks and customers' money.
(b) To conduct business operations for banks.
(c) To give rewards to customers who deposit money in banks.
(d) To provide ATM cards to bank customers.
Answer: A

Module 5: Account opening procedures

(1) What does Kala want to do after meeting Shruti Didi?
(a) Convince Kalpesh to open a savings account at Ujjivan Small Finance Bank.
(b) Continue keeping her money in a money jar.
(c) Convince Kalpesh to invest her money in a risky scheme.
(d) Give her money to Shruti Didi
Answer: A

(2) Why was Kalpesh hesitant about opening a bank account?
(a) He did not trust Rama.
(b) He didn't like the manager in the bank near him.
(c) He did not have enough money to deposit in the bank.
(d) He has heard stories of people being cheated by people pretending to be bank representatives.
Answer: D

(3) How is Kala able to open a savings account with Ujjivan?
(a) By filling out a lot of forms at a Ujjivan bank branch.
(b) By providing her Aadhar and valid ID and scanning her fingerprint with a biometric scanner.
(c) By giving Shruti Didi her personal details and visiting the bank branch with her.
(d) By paying 4000 rupees to Shruti Didi.
Answer: B

Module 6: Managing and accessing money in a bank account

(1) What is a passbook according to Shruti didi?
(a) A tool to keep track of account activity
(b) A book to write down your personal transactions
(c) A list of banks in the area
(d) A list of nearby bank account holders
Answer: B

(2) What did Kala receive from the bank?
(a) A diary
(b) A welcome kit
(c) A personal computer
(d) A smartphone
Answer: B

(3) What should you do if you lose your ATM card or personal documents?
(a) Nothing, have patience and see if they turn up
(b) Report the loss to the bank or authorities as soon as possible
(c) Tell your friends and ask them to ask their friends
(d) Put an advertisement in the news paper
Answer: B

Module 7: Investment - FD and RD

(1) What was Kala eagerly telling Ramesh, Rama's husband about?
(a) Her cooking skills
(b) Her savings and banking journey
(c) Her recent vacation
(d) Her favorite TV show
Answer: B

(2) Why had Ramesh invited Shruti Didi to their house?
(a) To deposit money into his account
(b) To ask for investment advice
(c) To withdraw money for Raju's school fees
(d) To open a new bank account
Answer: C

(3) Why couldn't Kala open a fixed deposit and why did opening a recurring deposit suit her better?
(a) Kala did not have enough savings yet to open a fixed deposit
(b) Rama did not let her
(c) Kala was not eligible for a fixed deposit because of low experience in banking
(d) Kala wanted to withdraw her savings anytime she needed, which was not possible with a fixed deposit.
Answer: A

Module 8: UPI and Digital Banking

(1) What did Kala see some customers doing while grocery shopping?
(a) Taking pictures of fruits and vegetables
(b) Taking pictures of UPI QR code
(c) Paying with cash
(d) Asking the shopkeeper to write down the balance
Answer: B

(2) What is the central theme of this story?
(a) How to save money effectively
(b) The benefits of using UPI for financial transactions
(c) How to protect yourself from financial fraud
(d) The importance of visiting friends and family
Answer: B

(3) What should one do to send money using UPI?
(a) Give cash to the intended recipient
(b) Send a message on Whatsapp
(c) Transfer money from one ATM to another
(d) Use the UPI app to enter the recipient's phone number and transfer the desired amount
Answer: D

Module 9: Loans

(1) What inspired Kala to start her own business?
(a) Kalpesh's drinking habit
(b) The growth of the shopkeeper she met
(c) Rama's suggestion

(d) Shruti didi's wealth
Answer: B

(2) What kind of business did Kala and Rama start?
(a) A grocery shop
(b) A tea shop
(c) A food business selling pickles and papads
(d) A saree shop
Answer: C

(3) What event led to Kala and Rama receiving a lot of orders?
(a) Diwali
(b) Holi
(c) Ganesh Chaturthi
(d) Christmas
Answer: C

A.3 Appendix C: Question-wise analysis of pre-post test

Please find the question-level analysis at the end of the appendix.

A.4 Appendix D: Our Automatic Speech Recognition Details

Previously, Conformer model has shown to give state-of-the-art results on many Automatic Speech Recognition (ASR) benchmark datasets [34] . Therefore, we chose a model that has 15 layer Conformer encoder with 4 attention heads and 6 layer Transformer [71] decoder with 4 attention heads to test the quality of the data generated. We train both the encoder and decoder with a drop out rate of 0.1 for 56 epochs with the initial learning rate set to 0.0005. We train this model based on the CTC/Attention criterion [42] where the objective function (L_{MTL}) is a combination of the Connectionist Temporal Classification (CTC) loss and the Attention-based loss as follows:

$$L_{MTL} = \lambda \log p_{ctc}(c|x) + (1-\lambda) \log p^{*}_{att}(c|x)$$

We use this objective function as it has shown to result in a stable model with modest improvements [42]. Here, λ is the multi-task coefficient that satisfies the following: $0 \leq \lambda \leq 1$. We found λ set to 0.3 to give us the best result. c is the output target. In our study, these are characters. Finally, x is the input acoustic features, i.e., 80 dimensional log-mel features extracted from the audio recordings.

We also train an independent 2 layer Recurrent Neural Network-based (RNN) Language Model (LM) for 40 epochs. The decoder of the ASR uses this LM with a weight of 0.1 to predict the output targets.[1] This method of LM integration into the ASR is known as Shallow Fusion [41] and it gives superior results compared to other forms of fusing LM into the ASR model [68]. [2] We use a beam search with size 10 to predict the output sequence. Our experiments are conducted using the ESPnet toolkit [76] with one Nvidia V100 GPU.

[1]The rest of the weight is given to the Hybrid CTC/Attention model.
[2]Only the training transcripts are used to train the LM

Table 4: Question-level analysis of pre-test and post-test

Question	Section #	Section Name	Pre-Test	Post-Test	Difference
What is one benefit of financial planning for health and accidents?	1	Saving and Financial Planning	75.7	81.1	5.4
What is the goal of financial planning?	1	Saving and Financial Planning	75.7	83.8	8.1
What is saving?	1	Saving and Financial Planning	78.4	89.2	10.8
Why is it important to cut down on non-essential wants?	2	Needs vs Wants	29.7	64.9	35.1
Why is it important to distinguish between needs and wants in financial planning?	2	Needs vs Wants	43.2	62.2	18.9
Which of the following statements is true?	2	Needs vs Wants	70.3	86.5	16.2
How to save money for emergencies and yearly needs?	3	Budgeting	86.5	97.3	10.8
Why is it important to maintain a budget diary?	3	Budgeting	37.8	62.2	24.3
What is budgeting?	3	Budgeting	75.7	97.3	21.6
What is the most important factor to consider before opening a bank account?	4	What is Banking?	67.6	91.9	24.3
Why are banks considered to be safe places to store money?	4	What is Banking?	21.6	51.4	29.7
What is ‘interest’ provided by the bank?	4	What is Banking?	40.5	94.6	54.1
How can you open a savings bank account?	5	Opening a bank account	75.7	91.9	16.2
What is the most important thing to remember when taking salary payments?	5	Opening a bank account	54.1	94.6	40.5
What is a savings bank account?	5	Opening a bank account	89.2	94.6	5.4

Table 5: Continuation of question-level analysis

Question	Section #	Section Name	Pre-Test	Post-Test	Difference
Which of the following is the purpose of an ATM card?	6	How to manage and access your money in a bank account	78.4	91.9	13.5
Which of the following is a responsibility that comes with the convenience of banking?	6	How to manage and access your money in a bank account	67.6	83.8	16.2
What does it mean for money to get deposited in your account?	6	How to manage and access your money in a bank account	56.8	64.9	8.1
What is a recurring deposit?	7	Investment	8.1	37.8	29.7
What is a fixed deposit?	7	Investment	54.1	91.9	37.8
What is the benefit of opening a fixed deposit or a recurring deposit?	7	Investment	32.4	67.6	35.1
What is UPI?	8	UPI	64.9	97.3	32.4
How can you ensure the safety of using UPI?	8	UPI	67.6	91.9	24.3
What are the benefits of UPI?	8	UPI	37.8	67.6	29.7
What is the key to achieving success with a loan?	9	Bank Loans	48.6	91.9	43.2
What is the difference between borrowing money from a bank and borrowing money from a moneylender?	9	Bank Loans	64.9	100	35.1
What are some of the benefits of borrowing from a formal institution like a bank?	9	Bank Loans	64.9	89.2	24.3