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Effectiveness of Financial Literacy Interventions in Improving Financial Literacy among Rural Women in North India



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Contents

Introduction	1
Research Questions	2
The Sample	3
The Methodology	4
Comparison of the Two Samples	5
Analysis and Results	7
Long-term Impact of Training	7
Short-term Impact of Training	9
Retention of Learning	9
Comparison of Techniques of Training	11
Comparison of Individual and Joint Training	13
Improvement in Financial Literacy	14
Financial Knowledge	14
Financial Behavior	15
Financial Attitude	15
Impact of Training for the Disadvantaged Group	16
Education and Financial Knowledge	16
Education and Financial Behavior	17
Education and Financial Attitude	17
Income and Financial Knowledge	18
Income and Financial Behavior	19
Income and Financial Attitude	19
Conclusion	20
Annexure 1: Summary of the UNDP Intervention of 2012	21
Annexure 2: Training Material and Methodology for the Experimental Study	21
Annexure 3: The OECD-INFE Instrument for Measuring Financial Literacy	24

Executive Summary

The study was focused on financial literacy of women. It attempted to determine whether financial literacy interventions improve financial literacy significantly in the long-term (eighteen to twenty months after the intervention) and in the short-term (one to three months after the intervention). The improvements in the literacy scores in the short-term and in the long-term were then used to assess the extent of change in financial literacy over time. The study also investigated the efficacy of six alternate training methods, using three techniques - lectures; lectures and movies; and lectures, movies and games, with the training being imparted without and with an accompanying adult (generally spouse).

The improvement in the financial literacy in the long-term was assessed by comparing the financial literacy scores of a sample of 2548 women who had been imparted training as a part of a UNDP project in 2012 with the financial literacy scores of a post-facto “quasi-control group” of 2548 women who had not participated in the UNDP project. Both the samples were drawn randomly from the same villages that had participated in the UNDP project.

The improvement in the financial literacy in the short-term was assessed by first imparting financial literacy training to a randomly chosen group of 779 women from the “quasi-control group” of 2548 women. A comparison of this group’s financial literacy scores three months after the training with scores before the training provided an assessment of the improvement in the financial literacy in the short-term.

A comparison of the improvements in financial literacy in the long-term and in the short-term as assessed above, was used to determine the decline/improvement in financial literacy over time.

The study used a randomized controlled experiment in which the 779 women chosen for imparting training in financial literacy were divided into six randomly chosen sub-samples of about equal size. Each of the six methods of training was used to train a randomly chosen sub-sample. The efficacy of each method of training was assessed by comparing the financial literacy scores one to three months after the training with the scores before the training for the relevant sub-sample. A comparison of the improvement in the financial literacy computed in the above manner, provided the basis for assessing the relative efficacy of different training methods.

The study also investigated whether the efficacy of the financial literacy training programs were influenced by the level of financial literacy of the participants before imparting training.

The principal findings of the study are:

- Training is effective in improving financial literacy in the long-term (eighteen months). However, the effectiveness varies across the three dimensions of financial literacy. While the effectiveness is high for financial knowledge and financial behavior, it is only marginal for financial attitude.
- Training is effective in improving financial literacy in the short-term (one to three months). The effect is the highest for financial knowledge and the least for financial attitude.
- There is a significant decline in financial knowledge and financial behavior over time. In case of financial attitude, the long term retention of learning is not statistically significant.
- The use of alternate techniques such as movies and games in the training programs does not have a significant impact on financial literacy. This is because the positive influence of games on financial behavior and financial knowledge is accompanied with negative influence on financial attitude.

- Joint training vis-a-vis individual training has a beneficial impact on financial attitude and financial knowledge. It however has practically no impact on financial behavior.
- In terms of percentage improvement in learning, training benefits women with low levels of financial literacy far more than women with relatively higher levels of financial literacy prior to imparting training. This is heartening since the key purpose of the training programs is to benefit those with low initial levels of financial literacy.
- Women with low level of family income and low level of education benefit significantly from the training imparted. The result confirms the value of training for the most disadvantaged segment.

Introduction¹

Research from around the world on financial literacy raises serious concerns about the ability of individuals to secure their financial well-being. There is evidence that individuals under-save, fail to invest wisely and are often indebted. Past studies have documented low levels of financial literacy in general among different socio-demographic groups. Literacy levels are particularly low among women, and among people with lower levels of family income and education. In a previous study, we documented the same pattern in India as well.

The findings of poor financial literacy and financial outcomes have prompted a serious review of existing financial education programs and launch of new programs globally. In India, the Reserve Bank of India (RBI) has mandated that banks take the initiative to enhance financial inclusion and financial literacy in the country. A draft national strategy for financial education was prepared and released by RBI in July 2012.

It is evident that there is a need to investigate the growing scepticism about the effectiveness of financial literacy programs. A meta-study² of over 200 studies on financial literacy found that interventions to improve financial literacy had very weak effects, and the effects were even weaker in low-income samples. It was also found that like other education, the learning from financial education decays over time; the retention of learning even from interventions with many hours of instruction is poor several months after the intervention.

One stream of literature³ treats the acquisition of financial knowledge as an investment in human capital. The argument is that a low level of financial literacy may be individually rational for certain groups of people because the cost of acquiring financial knowledge (time, effort and money) exceeds the benefits. There could still be a role for financial literacy programs if this perverse outcome is due to lack of easy and cost-effective access to financial education. But if the low equilibrium is the result of low private benefits from financial education, then such education programs would be less successful. For example, if individuals perceive low benefits from financial education because their access to financial products is limited, then they would have very little incentive to improve their financial literacy even if they had access to free financial education programs. Moreover, in the absence of opportunity to use their knowledge, any improvement in financial literacy may decay quickly.

In this context, this study makes use of a large field experiment to investigate the effectiveness of financial literacy programs. India is a suitable place for such a study because of the innovative and multidimensional financial literacy training programs that have become well established over the last several years. High levels of illiteracy have led to the belief that traditional lecture-based pedagogy would be ineffective in India. Trainers dealing with illiterate, rural and low-income audiences have resorted to audio visual and more interactive training methods that include use of movies and games. It is possible that while these methods would be more expensive for the trainers in terms of time, effort and resources, they might be more effective than the traditional pedagogy based on lectures in the Indian context.

¹These are preliminary results from an ongoing research study. Please do not cite without prior permission. The authors can be contacted by email: Prof. Sobhesh Kumar Agarwalla <sobhesh@iimahd.ernet.in>, Prof. Samir K Barua <skbarua@iimahd.ernet.in>, Prof. Joshy Jacob <joshyjacob@iimahd.ernet.in> and Prof. Jayanth R Varma <jrvarma@iimahd.ernet.in>.

²Fernandes, D., Lynch Jr, J. G., and Netemeyer, R. G. (2014). "Financial Literacy, Financial Education, and Downstream Financial Behaviors". *Management Science*.

³For example, Lusardi A, and Mitchell, O.S. (2013). "The Economic Importance of Financial Literacy: Theory and Evidence", *National Bureau of Economic Research, Working Paper 18962*.

Research Questions

The starting point of this study was a project undertaken by UNDP in 2012 in India. A brief description of the project is provided in **Annexure 1**. As a part of the UNDP project, 50,000 women from three districts of the Indian state of Uttar Pradesh, namely, Jaunpur, S.R.N. Bhadohi and Mirzapur, had been imparted financial training, enrolled in self-help groups, and provided access to financial savings products. The training methodology in the UNDP project used lectures, movies and games. The details of the training methodology and the material used are described in **Annexure 2**.

As the UNDP project did not envisage an assessment of the impact of training, it did not include measurement of the level of financial literacy of the beneficiaries from the project either before or after imparting training. The focus of our study was to investigate the efficacy of different pedagogies for imparting financial literacy. In addition, we were also interested in investigating the possible decline over time of the level of financial literacy of those who were imparted training. This required measurement of financial literacy was carried out using the OECD-INFE questionnaire that has become the standard instrument for such measurement. The instrument provides separate scores for the three components of financial literacy, namely, financial knowledge, financial behavior and financial attitude. A short description of the instrument is provided in **Annexure 3**.

We were interested in investigating the efficacy of different pedagogies that may be used for financial literacy programs. We, therefore, identified six different ways of imparting training based on three different techniques: lectures, lectures and movies, and lectures, movies and games, and two methods of organizing the individuals for training: individually and accompanied by an adult member of the family (generally spouse).

The research questions that we attempted to answer were the following:

1. Do the training programs improve financial literacy in the long-term (eighteen to twenty months after the intervention) particularly when the training is accompanied with improved access to financial products?
2. Do the training programs improve financial literacy in the short-term (three months after the intervention) without being accompanied with improved access to financial products?
3. Is there a decline in the retention of financial literacy over time?
4. Does the effectiveness of the training programs improve with the use of movies and games in addition to lectures?
5. Does the effectiveness of the training programs improve if it is imparted in the company of an adult member of the family (mainly spouse) across different techniques of training?
6. Do the training programs benefit those with relative low levels of financial literacy more than those with higher levels of financial literacy before imparting of training?
7. Do the training programs benefit individuals from greatly disadvantaged segments - women belonging to the lowest level of education and lowest level of family income?

The Sample

The two primary samples were the following:

1. Group 1 : 2548 women chosen randomly from UNDP assisted women. All the women in the samples were administered test to measure their level of financial literacy.
2. Group 2 : 2548 women chosen randomly from those women who were not a part of the UNDP project. This was the "quasi-control group" that was created at the time of this study in 2014. All the women in the sample were administered test to measure their level of financial literacy.

The above samples were drawn randomly from the same villages that had participated in the UNDP project in 2012 thereby ensuring that the samples were from the same population. Though we planned to use a sample size of 2,500 women, the actual sample size turned out to be 2548 women, as multiple investigators were simultaneously deployed to administer the questionnaire.

As described in the preceding section, We used six methods of training (treatments), arising from three techniques (lectures; lectures and movies; lectures, movies and games) and two compositions of recipients of training (individual; individual accompanied by an adult member of the family). A total of 779 women (chosen randomly out 2548 women in Group 2) were imparted training in this manner.

The sub-samples for different methods of training were as follows:

3. Group 3: 261 women trained using lectures, of which,
 - (A) Group 3A : 135 women were trained individually.
 - (B) Group 3B : 126 women were trained along with an adult companion from the family (joint training).
4. Group 4: 271 women trained using lectures and movies, of which,
 - (A) Group 4A : 130 women were trained individually.
 - (B) Group 4B : 141 women were trained along with an adult companion from the family.
5. Group 5: 247 women trained using lectures, movies and games, of which,
 - (A) Group 5A : 122 women were trained individually.
 - (B) Group 5B : 125 women were trained along with an adult companion from the family.

The level of financial literacy of women in all the six sub-samples was measured one to three months after they had undergone training in the above manner. It would be pertinent to note that the level of financial literacy of these women had already been measured prior to the training program (as members of Group 2).

The Methodology

To answer the first research question, we statistically compared the mean level of financial literacy of Group 1 with the mean level of financial literacy of Group 2. The comparison would provide an assessment of the extent of retention of financial literacy since the conclusion of the UNDP project i.e. in the long-term.

To answer the second research question, we statistically compared the mean level of financial literacy scores of an aggregation of Group 3 to 5 after the training had been imparted with the mean level of its financial literacy scores before imparting the training. The comparison would provide an assessment of the extent of retention of financial literacy in the short-term.

To answer the third research question, we compared the change in the financial literacy score in the short-term with that in the long-term. The change in the short-term was measured as the difference in the mean financial literacy scores of Group 5A after and before the training program and the change in the financial literacy score in the long-term was measured as the difference between the mean financial literacy scores of Group 1 and Group 2. A statistical comparison of the two changes would provide an assessment of the decline/improvement in the financial literacy over time. It will be pertinent to note that Group 1 and Group 5A were trained using identical method of training, and hence were comparable⁴.

We sought answer to the fourth research question by computing the changes in the mean financial literacy score due to training for Groups 3, 4, and 5. We then compared the changes thus computed to assess the relative efficacy of the three techniques of training, namely, lectures, lectures and movies, and lectures, movies and games. We also examined whether there were differences in the efficacy of techniques when training was imparted individually and jointly, by computing the mean changes in the financial literacy scores for relevant samples.

To answer the fifth research question, we first computed the differences in the mean scores after and before imparting the training programs for two aggregation of Groups: “3B, 4B & 5B” and “3A, 4A & 5A”. A statistical comparison of the differences would provide as assessment of the relative efficacy of training being imparted jointly rather than individually to participants in the program.

The answer to the sixth research question would require greater elaboration of the methodology.

The extent of benefit derived by a participant from the financial literacy program may be contingent on the participant’s score before going through the programme. This would be taken into account while measuring the benefit derived by the participants. The method of measuring benefit derived by a participant from the programme, after taking into account her initial level of literacy is best elaborated through the following illustration.

Illustration:

Let us assume that the maximum score for a dimension in a test is 100. Then a participant (A) with a score of 80 in that dimension before the training program has the potential to improve her score after the program by a maximum of 20 points. On the other hand, another participant (B) with a score of 60 before the training program has the potential to improve her score after the program by 40 points. Therefore, the absolute increase in the scores of A and B cannot be compared, given the differential scope for improvement for the two participants. The improvement, therefore, should be measured by computing the percentage improvement achieved by each participant in relation to the potential for improvement. For example, if the

⁴As a robustness check, the comparison was also carried out using the aggregation of Groups 3, 4, and 5 instead of Group 5A. This comparison which provides a larger sample size at the cost of an inaccurate matching of training method yielded qualitatively similar results.

absolute score of A were to improve by 8 and that of B by 16, then both would be regarded as having achieved the same degree of improvement since the percentage improvements are identical (for A it is $8/20$ and for B it is $16/40$, that is, both have demonstrated a 40% improvement).

Using a similar reasoning, measurement of the decline in score would also have to take into account the score of a participant before the training programme. Continuing with the illustration in the paragraph above, a score of 72 for A and 54 for B after the training program would imply that the decline in knowledge is identical for A and B. That is so, because these scores would represent 10% decline in knowledge (for A it is $8/80$ and for B it is $6/60$, that is, both have experienced a 10% decline in their knowledge).

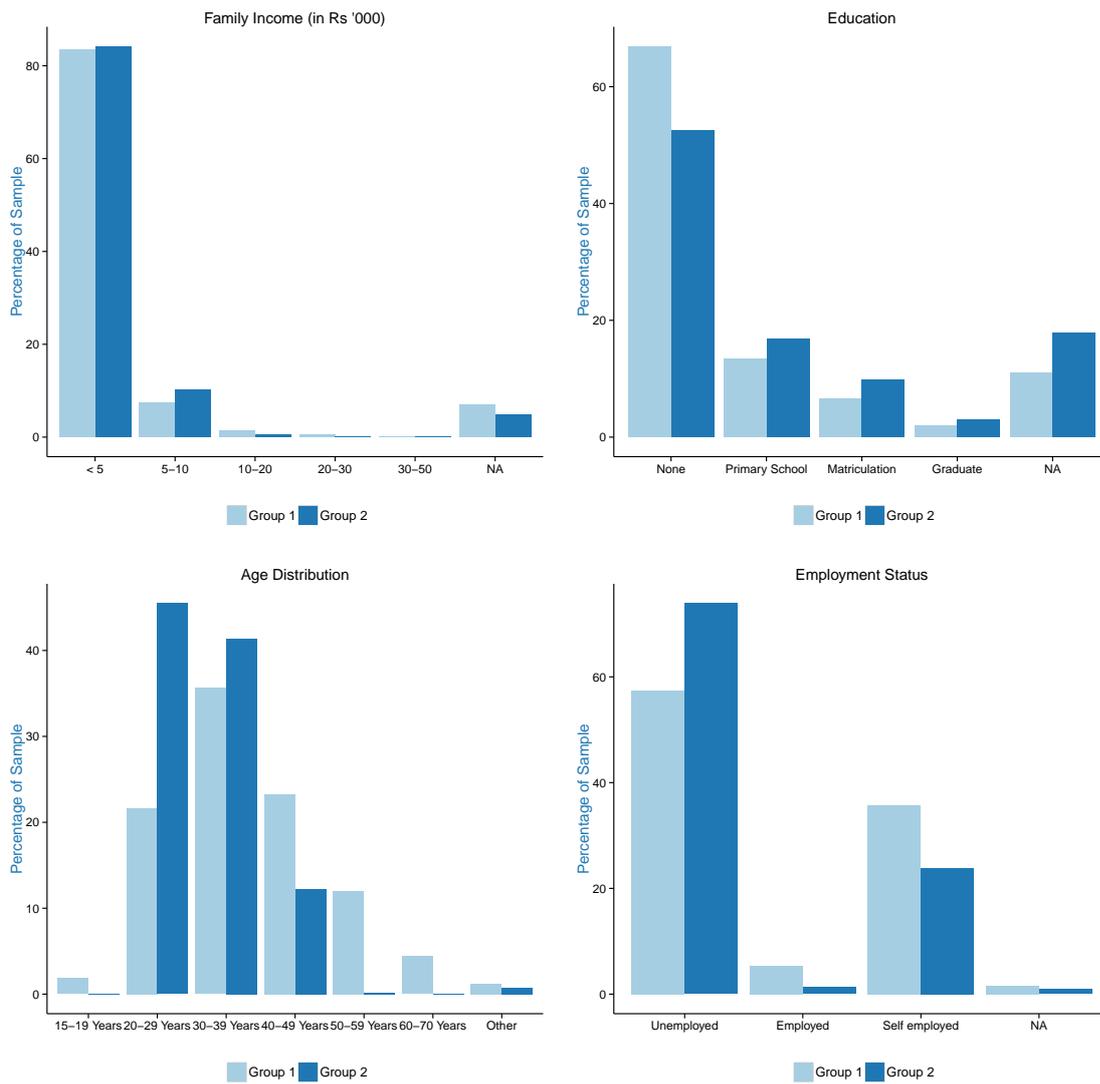
The percentage improvement or decline in financial literacy was measured as explained above for each participant. This data was statistically analysed to assess the influence of initial scores on the extent of improvement or decline in the scores of individuals as measured by their level of financial literacy after the training.

The method of analysis to answer the seventh research question was the same as the method used for answering the sixth question. The percentage improvement or decline from the initial scores in financial literacy would be measured for women in the lowest category of education and family income. The extent of improvement observed would be used to determine whether the financial literacy training programs benefited the truly disadvantaged segments.

Comparison of the Two Samples

A comparison of the two samples (those trained in 2012 by UNDP and the control group) is given in Figure 1. The two samples are similar in terms of family income, education, age and employment status. Most of the women have family income of less than ₹ 5,000 per month and have no formal education. In terms of age, the women belonging to the control group are younger than the women trained in 2012. The age difference is reflected in the differences in the employment status, but the marital status is similar across the two samples. About 90% of the participants in the study are married.

Figure 1: A Comparison of the Two Samples on Socio-Demographic Attributes



Analysis and Results

Long-term Impact of Training

The long-term impact was assessed by comparing the average scores of the sample drawn from individuals who had been trained in 2012 (Group 1) with those of a control group (Group 2) that had received no training. The scores for financial knowledge, financial behaviour, financial attitude and financial literacy for the two groups are presented in Table 1.

Table 1: Average scores for assessment of long-term impact of training

Group	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Group 1 (UNDP trained in 2012)	4.93	5.23	3.64	13.80
Group 2 (Control, trained in 2014)	3.90	4.12	3.56	11.53
Change in score	1.04	1.11	0.07	2.27

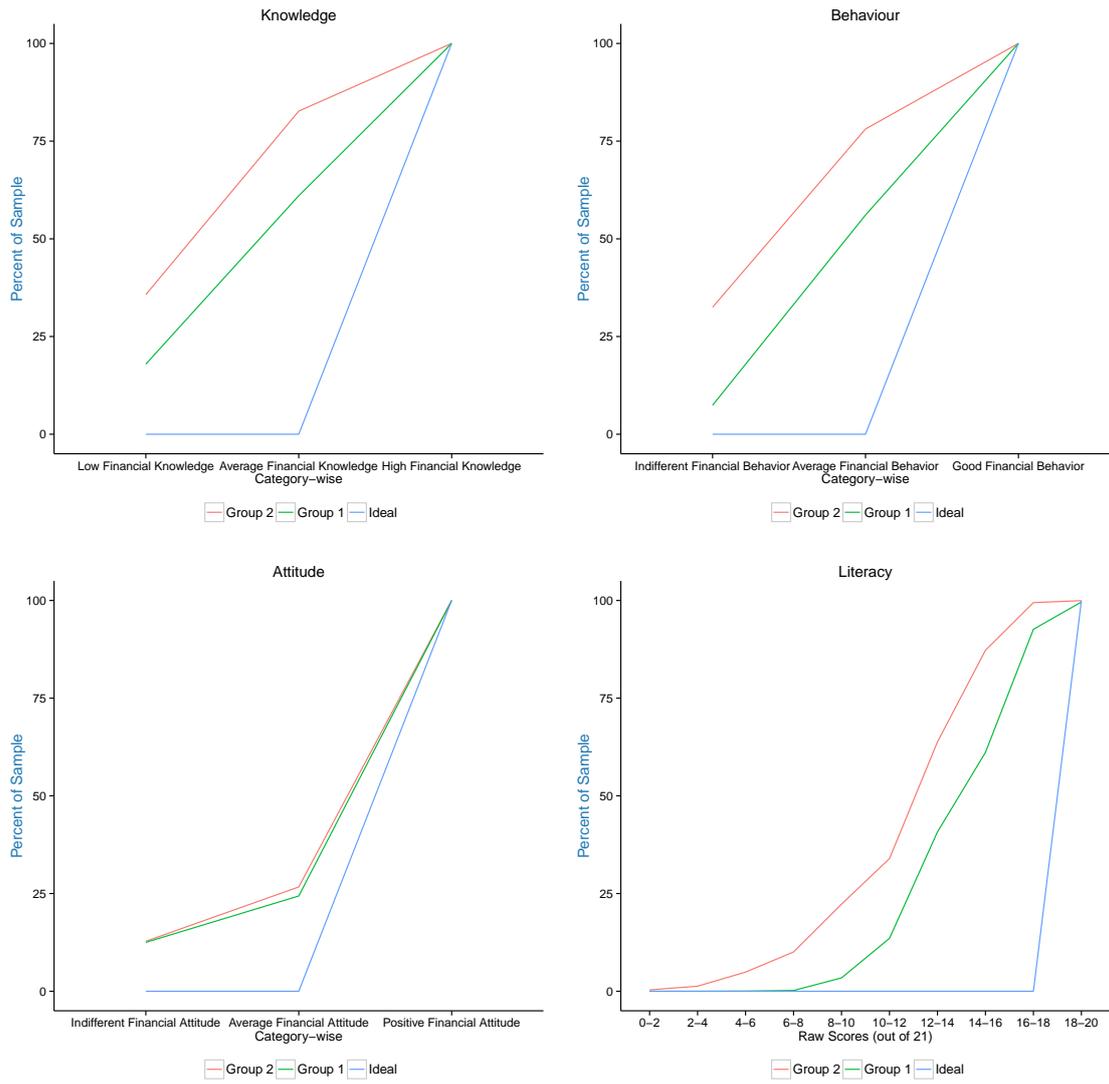
Both groups comprise 2548 women

It is evident from the differences in the scores for the two groups that despite a passage of about eighteen months, the group that was trained in 2012 showed superior scores for all dimensions. The beneficial impact of training in the long-term is more pronounced for financial knowledge and financial behaviour. The impact is marginal for financial attitude. All the improvements are statistically highly significant. The results are heartening since there is clear evidence that benefits from training are indeed retained over time.

For a visual comparison of the literacy of two groups, it is useful to plot the cumulative frequency distributions or ogives. The ogive shows the percentage of the group with a literacy score below a certain level. One way to think of the ogive is as follows. If an arbitrary threshold level is chosen to categorize a literacy score as low, then the prevalence of low literacy in a group can be measured by the fraction of the group that has a literacy at or below this threshold. The difficulty of course is that this requires a choice of the threshold for low literacy. The ogive gets around this problem by plotting this fraction for all possible values of this threshold.

The ogives for the two groups for financial literacy and its components are presented in Figure 2. For example, if a threshold of 10–12 is chosen, it may be seen from the bottom right panel of Figure 2 that about 34% of Group 2 have a literacy score at or below this threshold (red line) while for Group 1, the corresponding number is only around 14% (green line). Group 1 is better because it has lower fraction of women with low literacy. In the ideal case (with everyone perfectly literate), the fraction of women with low scores should be zero (blue line). It is evident from the figure that regardless of what threshold is chosen, Group 1 is better than Group 2 (lower fraction of women with lower literacy than the threshold). The graphs thus shows evidence of retention of learning by the group that was trained in 2012 on all dimensions of financial literacy.

Figure 2: Long term effect of training on financial literacy and its components



Short-term Impact of Training

The short-term impact of training was assessed by comparing the average scores after and before the training of all women who were trained in 2014. The scores for the financial knowledge, financial behaviour, financial attitude and financial literacy for this group are presented in Table 2.

Table 2: Average scores for assessment of short-term impact of training

Group	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Groups 3–5 after training	5.96	5.25	3.88	15.09
Groups 3–5 before training	4.01	3.97	3.50	11.40
Change in score	1.95	1.27	0.37	3.69

Both groups comprise 779 women

It is evident from the change in the average scores that there is a beneficial impact of training in the short-term (one to three months after training) for all the three dimensions. As with long-term benefits, the short-term benefit for financial knowledge and financial behaviour is more pronounced than for financial attitude. All the three improvements are statistically highly significant.

The ogives for financial literacy and its components, after and before training, are presented in Figure 3. It is evident from the graphs that there is evidence of retention of learning in the short-term. The results clearly establish the beneficial impact of training on financial literacy. The improvements in scores also indicate that the benefits in the short-term are higher than the benefits in the long-term. This decline is analysed in detail in the next section.

Retention of Learning

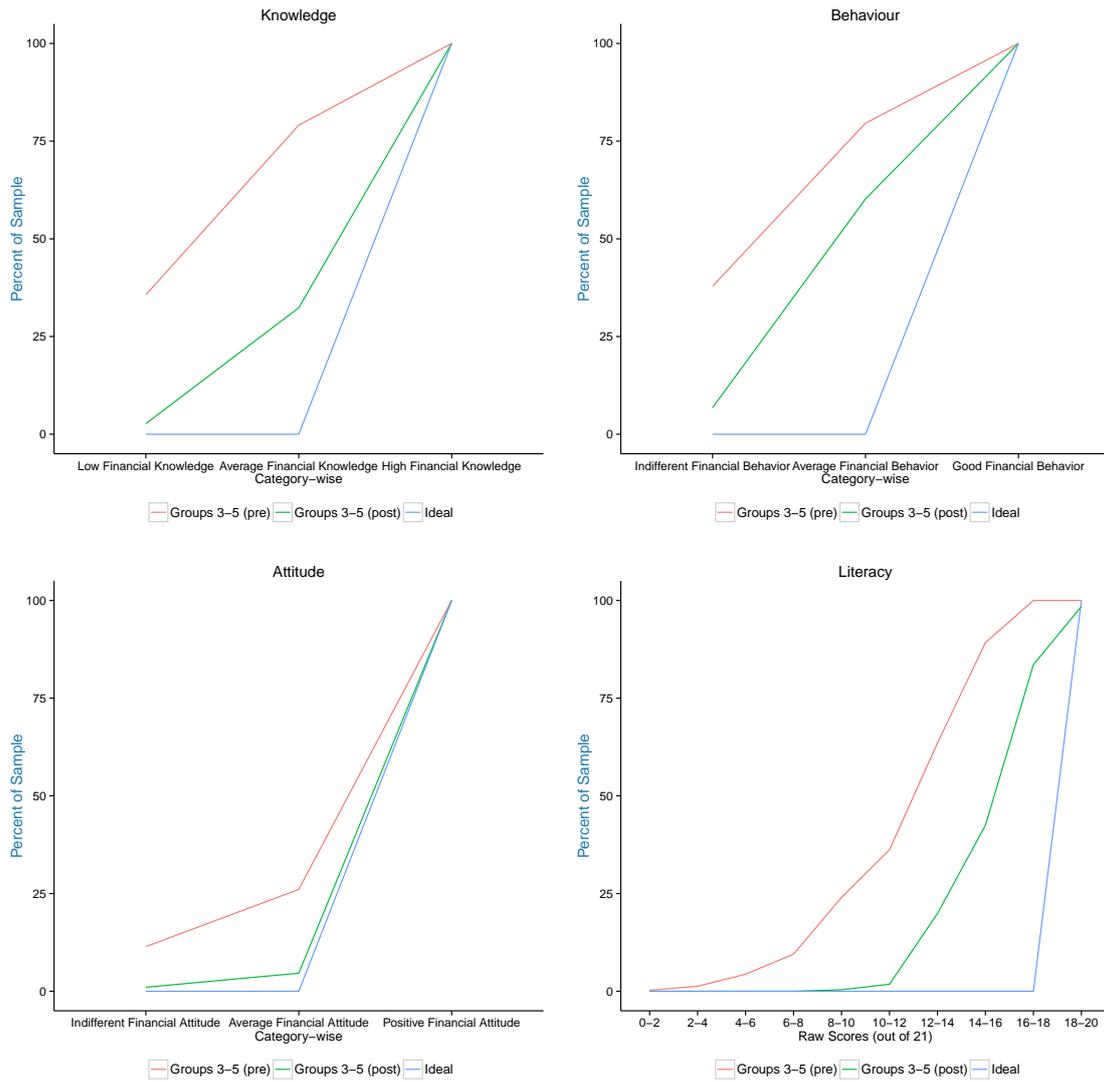
It is well recognized that benefits from any training/education usually decline over time, unless the ideas and concepts are used and get reinforced through experience and repetition of training. The UNDP program imparted training to the target group in 2012 and in addition to training provided access to formal financial services. Therefore, conditions were created to reinforce the benefits from training. Despite that, is there evidence of possible decline in retention of learning? Or, do those who were trained show an improvement in their understanding of how to manage their financial situation, because of experience from getting an opportunity to manage their finances? Answers to these queries are explored by comparing the learning for Group 1 (trained in 2012) with that of a comparable group (Group 5A) that was trained using the same pedagogy in 2014. The results are presented in Table 3.

Table 3: Change in average scores (After – Before) for assessment of improvement (decline) in learning

Group	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Group 5A* – trained in 2014	1.99	1.91	-0.39	3.51
Group 1 (UNDP trained in 2012)	1.04	1.11	0.07	2.27
Improvement (decline) in learning	(0.96)	(0.80)	0.46	(1.24)

* Group 5A consists of 122 women who were trained using the same pedagogy used for UNDP training

Figure 3: Short term effect of training on financial literacy



There is clear evidence of decline in the retention of learning as measured by the average financial literacy scores for the two groups. In case of financial knowledge and financial behavior, there is a significant decline in the retention of learning in the long term relative to short-term. In the case of financial attitude, the long term retention of learning is not statistically significant.

Figure 4 compares the improvement of financial literacy of Group 1 with that of Group 5A. The shaded portion (the gap between the pre-training and post-training ogives) represents the improvement of literacy or retention of learning. The decline in the retention of learning in the long term (Group 1) as compared to the short term (Group 5A) can be seen in the form of a thicker shaded portion on the left hand panels and a thinner shaded portion on the right hand panels. This decline in retention occurred despite the Group 1 women being provided with an opportunity to put into practice their learning from the training program. The results point to the need to perhaps provide refresher courses to improve retention of learning. The second training program could be different from the first and may have greater component of experience sharing among the group as that would bring alive in the classroom the differences in how the beneficiaries actually used their learning.

Comparison of Techniques of Training

The three techniques of training used were: lectures; lectures and movies; lectures, movies and games. The changes in the averages scores for the groups trained using the three techniques are presented in Table 4.

Table 4: Average change in scores (After – Before) for different pedagogies

Technique	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Lectures (Groups 3)	1.82	1.17	0.57	3.70
Lectures and Movies (Groups 4)	1.93	1.10	0.48	3.61
Lectures, Movies and Games (Groups 5)	2.12	1.57	0.07	3.76

There is varying impact of choice of technique for training. While improving financial knowledge, use of movies in addition to lecture results in decline in financial behavior and financial attitude. Overall, there is a marginal decline in financial literacy. Use of games in addition to lecture and movies improves financial knowledge and financial behavior significantly. It however has a significant negative impact on financial attitude. Overall, all the three pedagogies improve financial literacy. However, the marginal differences in the scores for financial literacy would suggest that additional effort in terms of cost and time to use movies and game may not be justified.

The impact of different techniques was analysed separately for the two different methods of training - individually and jointly (individual accompanied with an adult member of the family). The results of the analysis are presented in Table 5 and 6.

Figure 4: Decline in retention of learning with passage of time

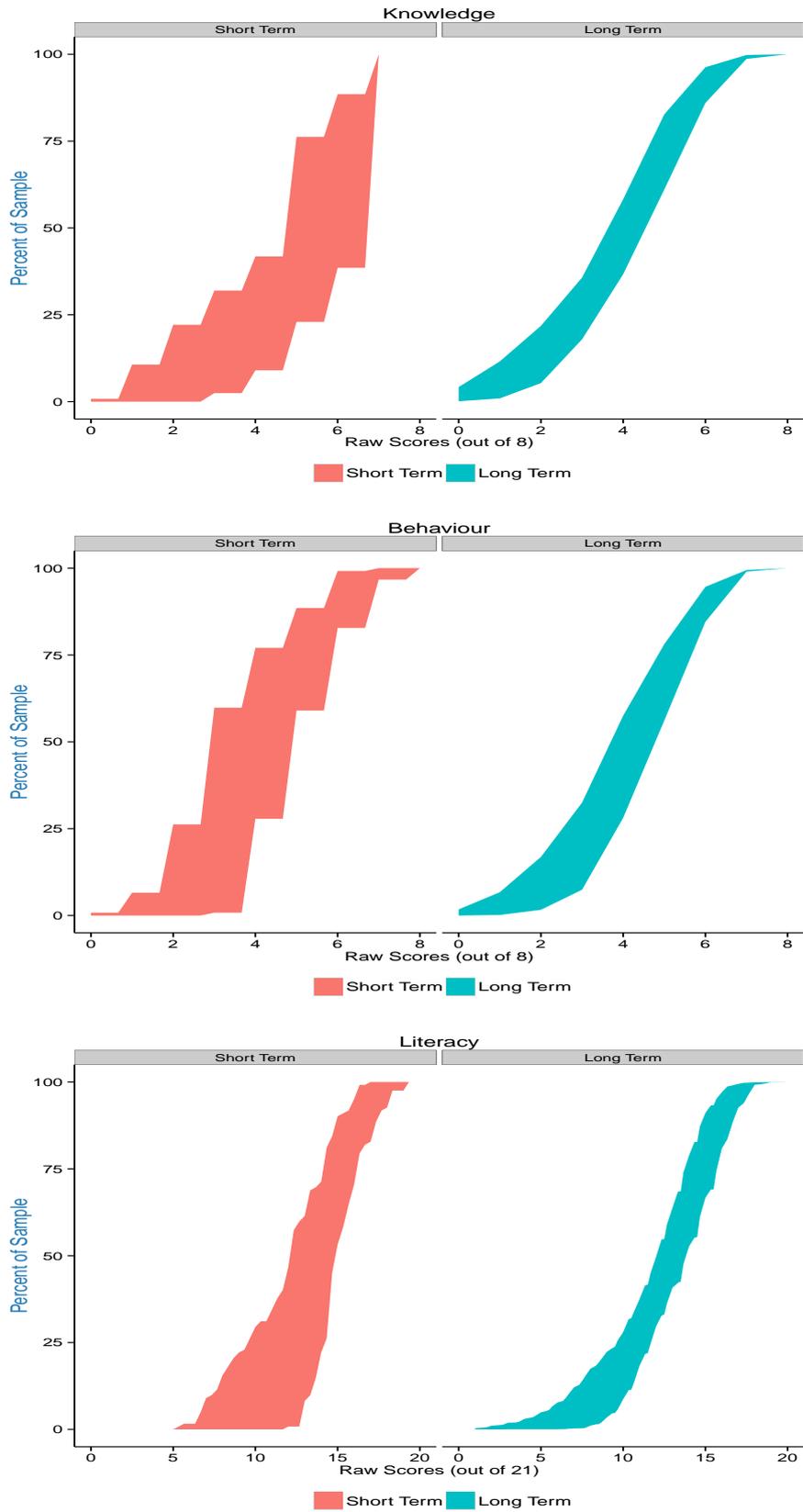


Table 5: Average change in scores (After – Before) for different pedagogies with individual training

Technique	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Lectures (Group 3A)	1.47	1.21	0.37	3.29
Lectures and Movies (Group 4A)	1.96	0.80	0.42	3.24
Lectures, Movies and Games (Group 5A)	1.99	1.91	-0.39	3.51

Table 6: Average change in scores (After – Before) for different pedagogies with joint training

Technique	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Lectures (Group 3B)	2.21	1.13	0.78	4.14
Lectures and Movies (Group 4B)	1.90	1.38	0.54	3.94
Lectures, Movies and Games (Group 5B)	2.24	1.24	0.52	4.00

The broad conclusion from the detailed analysis remains the same. There is no significant difference in the average score for financial literacy across the three techniques irrespective of the manner of imparting training (individually or jointly). Use of games in general has a beneficial impact on financial knowledge. It however impacts financial attitude negatively. Use of movies appears to have very mixed impact on different dimension of financial literacy. Overall, the detailed analysis confirms the earlier conclusion that additional effort and cost in adding movies and games to the technique of instruction in the training programs may not be justified.

Comparison of Individual and Joint Training

The change in the average scores for the financial knowledge, financial behaviour, financial attitude and financial literacy when training is imparted to individuals, jointly and individually, are presented in the first two rows of Table 7. The last row of the table is the difference in the average improvement in scores for the two compositions.

Table 7: Change in Average Scores for Joint and Individual Training

Micro Group Composition	Financial Knowledge	Financial Behavior	Financial Attitude	Financial Literacy
Joint (Groups 3B,4B & 5B)	2.11	1.25	0.61	4.03
Individual (Groups 3A,4A & 5A)	1.80	1.29	0.14	3.34
Difference in change	0.31	-0.04	0.48	0.68

A noteworthy feature of the results is a significant improvement in financial knowledge and financial attitude when training is imparted jointly. There is little difference in financial behavior. As a result of the improvement in two of the three dimensions, there is also a significant improvement in the score for financial literacy when training is imparted jointly.

Improvement in Financial Literacy

The extent of improvement in the three dimensions of financial literacy for different categories of individuals, using the methodology described earlier is separately reported in this section.

Financial Knowledge

The mean percentage improvement in the scores for financial knowledge vis-à-vis the potential for improvement for the three categories of individuals (based on their scores in financial knowledge before imparting training) is summarized in Table 8.

Table 8: Percentage changes in the financial knowledge score

Category (prior to training)	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Low financial knowledge	273	0	5	67.1%	
Average financial knowledge	230	39	69	53.5%	-24.5%
High financial knowledge	72	34	57	50.0%	-25.7%
Total/Average	575	73	131	59.5%	-25.1%

Out of the 779 individuals in the sample, 575 (73.8% of the sample) showed an increase, 73 (9.4% of the sample) showed a decrease, and 131 (16.8% of the sample) showed no change in their score in financial knowledge after the training. The average improvement in score at 59.5% for those who showed an improvement was far higher than the decline in score at 25.1% for those who exhibited a decrease in financial knowledge. This indicates a significant enhancement of financial knowledge through training. What is even more noteworthy is that 273 (out of 278) individuals who were in the lowest category of financial knowledge before training showed the highest average improvement of 67.1% in their score among the three categories.

Financial Behavior

The mean percentage improvement in the scores for financial behavior vis-à-vis the potential for improvement for the three categories of individuals (based on their scores in financial behavior before imparting training) is summarized in Table 9.

Table 9: Percentage changes in the financial behavior score

Category (prior to training)	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Indifferent financial behavior	285	1	9	53.0%	-33.3%
Average financial behavior	199	45	81	45.0%	-24.3%
Good financial behavior	18	93	48	58.3%	-31.9%
Total/Average	502	139	138	50.0%	-29.5%

Out of the 779 individuals in the sample, 502 (64.4% of the sample) showed an increase, 139 (17.8% of the sample) showed a decrease, and 138 (17.7% of the sample) showed no change in their score in financial behavior after the training. The average improvement in score at 50% for those who showed an improvement was far higher than the decline in score at 29.5% for those who exhibited a decrease in the score for financial behavior. This indicates a significant enhancement of financial behavior through training. What is even more noteworthy is that 285 (out of 295) individuals who were in the lowest category of financial behaviour showed significant average improvement of 53% in their score for financial behavior.

Financial Attitude

The mean percentage improvement in the scores for financial attitude vis-à-vis the potential for improvement for the three categories of individuals (based on their scores in financial attitude before imparting training) is summarized in Table 10.

Table 10: Percentage changes in the financial attitude score

Category (prior to training)	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Indifferent financial attitude	70	0	0	77.1%	
Average financial attitude	107	4	3	66.6%	-25.0%
Positive financial attitude	208	252	116	58.4%	-23.1%
Total/Average	385	256	119	64.1%	-23.1%

Out of the 760 individuals in the sample, 385 (50.7% of the sample) showed an increase, 256 (33.68% of the sample) showed a decrease, and 119 (15.7% of the sample) showed no change in their financial attitude score after the training. The average improvement in the score at 64.1% for those who showed an improvement was far higher than the decline in the score

at 23.1% for those who exhibited a decrease in financial attitude. This indicates a significant enhancement of financial attitude through training. What is even more noteworthy is that all the 70 individuals who were in the lowest category of financial knowledge before training, together, showed the highest average improvement of 77.1% among the three categories.

Impact of Training for the Disadvantaged Group

Research across the world shows that financial literacy levels are particularly low among those with low levels of education and income. In our sample too uneducated women had much lower levels of financial literacy scores as compared to women with matriculation or higher education. Similarly, women with family income of less than Rs. 5,000 too had much lower levels of financial literacy scores compared to women with a higher level of income. We examined whether financial literacy training is successful in enhancing the literacy levels of these disadvantaged sections of society.

Education and Financial Knowledge

The mean percentage improvements in the scores for financial knowledge vis-à-vis the potential for improvement for the five categories of individuals, based on their education level, are summarized in Table 11.

Table 11: Percentage change in scores of financial knowledge for different education levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Graduate/Post-graduate	15	4	4	49.4%	-17.0%
Matriculation/HSC/Vocational	41	4	17	56.9%	-20.8%
Primary School	68	12	30	54.9%	-23.1%
No Formal Education	328	46	67	56.2%	-26.1%
Refused to answer	123	7	13	73.1%	-28.6%
Total/Average	575	73	131	59.5%	-25.1%

The figures in Table 11 show that out of 441 women with no formal education, while 328 women (74.4%) showed an improvement, only 46 women (10.4%) showed a decline in financial knowledge after being imparted training. The average improvement for those showing enhancement of financial knowledge was 56.2% and the average decline for those showing decline in financial knowledge was 26.1%. Overall, there was 39.1% improvement in financial knowledge for this group. It is evident that training led to significant improvement in the financial knowledge of women with no formal education.

Education and Financial Behavior

The mean percentage improvements in the scores for financial behavior vis-à-vis the potential for improvement for the five categories of individuals, based on their education level, are summarized in Table 12.

Table 12: Percentage change in scores of financial behavior for different education levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Graduate/Post-graduate	14	4	5	62.2%	-33.8%
Matriculation/HSC/Vocational	43	9	10	41.6%	-33.0%
Primary School	67	27	16	42.6%	-34.3%
No Formal Education	268	72	101	48.7%	-25.5%
Refused to answer	110	27	6	59.6%	-33.3%
Total/Average	502	139	138	50.0%	-29.5%

The figures in Table 12 show that out of 441 women with no formal education, while 268 women (60.8%) showed an improvement, only 72 women (16.3%) showed a decline in financial behavior after being imparted training. The average improvement for those showing enhancement of financial behavior was 48.7% and the average decline for those showing decline in financial knowledge was 25.5%. Overall, there was 25.4% improvement in financial behavior score for this group. It is evident that training led to significant improvement in the financial behavior of women with no formal education.

Education and Financial Attitude

The mean percentage improvements in the scores for financial attitude vis-à-vis the potential for improvement for the five categories of individuals, based on their education level, are summarized in Table 13.

Table 13: Percentage change in scores of financial attitude for different education levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Graduate/Post-graduate	9	11	3	58.0%	-27.2%
Matriculation/HSC/Vocational	27	22	12	59.6%	-28.3%
Primary School	47	43	15	66.2%	-24.1%
No Formal Education	206	147	79	64.7%	-21.4%
Refused to answer	96	33	10	63.3%	-25.0%
Total/Average	385	256	119	64.1%	-23.1%

The figures in Table 13 show that out of 441 women with no formal education, while 206 women (46.7%) showed an improvement, 147 women (33.3%) showed a decline in financial attitude

after being imparted training. The average improvement for those showing enhancement of financial attitude was 64.7% and the average decline for those showing decline in financial knowledge was 21.4%. Overall, there was 23.6% improvement in financial attitude score for this group. It is evident that training led to significant improvement in the financial attitude of women with no formal education.

Income and Financial Knowledge

The mean percentage improvements in the scores for financial knowledge vis-à-vis the potential for improvement for the three categories of individuals, based on their income level, are summarized in Table 14.

Table 14: Percentage change in scores of financial knowledge for different income levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Upto Rs. 5000	494	63	114	59.3%	-25.6%
Rs. 5000-10000	45	4	8	51.8%	-25.9%
Refused to answer	36	6	9	72.0%	-18.8%
Total/Average	575	73	131	59.5%	-25.1%

The figures in Table 14 show that out of 671 women with family income level of up to Rs. 5000, while 494 women (73.6%) showed an improvement, only 63 women (9.4%) showed a decline in financial knowledge after being imparted training. The average improvement for those showing enhancement of financial knowledge was 59.3% and the average decline for those showing decline in financial knowledge was 25.6%. Overall, there was 41.3% improvement in financial knowledge for this group. It is evident that training led to significant improvement in the financial knowledge of women with low income.

Income and Financial Behavior

The mean percentage improvements in the scores for financial behavior vis-à-vis the potential for improvement for the three categories of individuals, based on their income level, are summarized in Table 15.

Table 15: Percentage change in scores of financial behavior for different income levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Upto Rs. 5000	445	113	113	49.7%	-29.3%
Rs. 5000-10000	25	13	19	45.3%	-23.9%
Refused to answer	32	13	6	58.7%	-36.5%
Total/Average	502	139	138	50.0%	-29.5%

The figures in Table 15 show that out of 671 women with family income level of up to Rs. 5000, while 445 women (65.7%) showed an improvement, only 113 women (16.8%) showed a decline in financial behavior after being imparted training. The average improvement for those showing enhancement of financial behavior was 49.7% and the average decline for those showing decline in financial knowledge was 29.3%. Overall, there was 28.0% improvement in financial behavior score for this group. It is evident that training led to significant improvement in the financial behavior of women with low income.

Income and Financial Attitude

The mean percentage improvements in the scores for financial attitude vis-à-vis the potential for improvement for the three categories of individuals, based on their income level, are summarized in Table 16.

Table 16: Percentage change in scores of financial attitude for different income levels

Category of individual	No. exhibiting increase (A)	No. exhibiting decrease (B)	No. exhibiting no change (C)	Mean change for (A)	Mean change for (B)
Upto Rs. 5000	319	246	88	63.8%	-23.2%
Rs. 5000-10000	22	7	28	70.3%	-20.0%
Refused to answer	44	3	3	63.1%	-27.9%
Total/Average	385	256	119	64.1%	-23.1%

The figures in Table 16 show that out of 671 women with family income level of up to Rs. 5000, while 319 women (47.5%) showed an improvement, 246 women (36.7%) showed a decline in financial attitude after being imparted training. The average improvement for those showing enhancement of financial attitude was 63.8% and the average decline for those showing decline in financial knowledge was 23.2%. Overall, there was 22.4% improvement in financial attitude

score for this group. It is evident that training led to improvement in the financial attitude of women with low income.

In sum, financial literacy training has significant beneficial impact on financial literacy of women with lower levels of education as well as lower levels of family income. The improvement is visible both in terms of the proportion of women from a disadvantaged background benefiting from the training program as well as the average improvement in the score for all the three dimensions of financial literacy.

Conclusion

The specific inferences that can be drawn from the study are as follows:

- Training is effective in improving financial literacy in the long-term (eighteen months). However, the effectiveness varies across the three dimensions of financial literacy. While the effectiveness is high for financial knowledge and financial behavior, it is only marginal for financial attitude.
- Training is effective in improving financial literacy in the short-term (one to three months). The effectiveness is the highest for financial knowledge and the least for financial attitude.
- There is a significant decline in financial knowledge and financial behavior over time. In case of financial attitude, the long term retention of learning is not statistically significant.
- The use of alternate techniques such as movies and games in the training programs does not have a significant impact on financial literacy. This is because the positive influence of games on financial behavior and financial knowledge is accompanied with negative influence on financial attitude.
- Joint training vis-a-vis individual training has a beneficial impact on financial attitude and financial knowledge. It however has practically no impact on financial behavior.
- In terms of percentage improvement in learning, training benefits women with low levels of financial literacy far more than women with relatively higher levels of financial literacy prior to imparting training. This is heartening since the key purpose of the training programs is to benefit those with low initial levels of financial literacy.
- Women with low level of family income and low level of education benefit significantly from the training imparted. The result confirms the value of training for the most disadvantaged segment.

The study demonstrates that embellishing the pedagogy based on lectures with use of movies and games does not enhance the efficacy of financial literacy training programs significantly. Therefore, a proper cost-benefit analysis ought to be made if it is expensive to develop training material using these techniques. The decline over time of financial literacy points to the need for refresher courses to enhance retention of learning in the long-term. Such courses ought to be based on sharing of experiences of participants in applying some of the learning from the programs. Joint training has a beneficial impact on two dimensions of financial literacy. An additional benefit of joint training is likely to be the support that a woman may receive from her spouse in her efforts to improve the family's financial situation based on the learning from the programs.

Annexure 1: Summary of the UNDP Intervention of 2012

One of the focal points of the UNDP India and IKEA Foundation programme for empowerment of women in India was their increased participation in economic activities. Among other objectives the programme envisaged to, *“Augment women’s participation and role in economic activities through promoting women-owned and managed enterprises, formation of women’s economic collectives, building financial and market alliances and networking with like-minded stakeholders. . . ”*. The initial phase of the programme targeted 500 villages of Jaunpur, Sant Ravidas Nagar and Mirzapur districts of Eastern Uttar Pradesh. The Indian School of Microfinance for Women (ISMW), under the UNDP initiative, launched programmes to improve financial literacy and to provide financial inclusion to 12,500 of women from the chosen districts. The financial literacy programme endeavoured to instil prudent money management skills among the target group, who were all members of women self-help groups (SHGs).

The financial literacy training involved 9 hours of training (3 hours per day over three days) for a group 25-30 from the target group. The programme familiarized the participants with: (a) basic principles and widely accepted practices in handling household finances and (b) formalities involved in the use of various savings, borrowing, and insurance products. The sessions employed a variety of methods including lectures, discussions, movies and games. The initial training was followed-up with a refresher training of two hours duration within the next 15 days. The financial literacy programmes were concluded in October 2012.

The programme targeted to substantially increase financial inclusion among the target group by providing product linkages with help from financial institutions. At the end of the programme, about 75% of the target group members were linked to various financial products including, no-frill savings bank accounts and insurance.

Annexure 2: Training Material and Methodology for the Experimental Study

The randomized controlled experiment to assess short-term impact of financial literacy interventions involved a total of about 2600 women (subjects). They belonged to 6 revenue blocks spread across three districts (Jaunpur, S.R.N. Bhadohi and Mirzapur) in eastern Uttar Pradesh, India. The subjects were enrolled for the study after ascertaining that they had not received any formal financial literacy training in the past.

The financial literacy scores for all the subjects prior to the experiment (pre-experiment) were measured using the OECD-INFE financial literacy questionnaire. The OECD questionnaire was translated into the local language (Hindi) to carry out the measurement. The questionnaires were administered to the subjects at their residence. Out of the 2600 subjects, valid measures of financial literacy could be obtained from 2548 subjects. The 2548 subjects were randomly divided into control and treatment groups comprising 1769 and 779 subjects, respectively. Subjects were assigned to treatment group only after they agreed to participate in financial literacy interventions subsequently. The treatment group was further divided into nearly equal 6 sub-groups for the purpose of exposing them to different treatments (financial literacy interventions).

Each treatment involved financial literacy training for a duration of 9 hours. The training was organised into 3 separate sessions, each of 3 hours duration, on 3 consecutive days. Each session was organised for a group of 25-30 subjects. The treatments varied in terms of pedagogical approach and covered commonly identified topics on personal and household finance. The different treatments are described in Table 1. The three treatments as above

Table A-1: Training Modules

Sl. no.	Treatment	Description
1	Conventional	The training involved lecture and discussion aimed at explaining various concepts related to financial literacy.
2	Conventional + movies	In addition to Treatment 1, two movies were used to cover various topics in financial literacy. One movie contrasted financial outcomes of two housewives who had similar socio-economic backgrounds, but differed starkly on their planning approach. Whereas one housewife is careful in her planning of expenditures, savings and borrowings, the other housewife has only a short-term focus in all financial matters. The movie is intended to educate the participants on the importance of financial planning. The second movie introduces an array of financial products and services useful to low-income households.
3	Conventional + movies + games	In addition to Treatment 2, the participants were involved in a game on financial literacy. The game was meant to introduce basic principles in savings such as: (a) earlier the better, (b) better late than never and (c) regular versus irregular savings. The simple game involved moving marbles between two boxes, where one acted as a savings bank, at fixed intervals for varying durations of time.

were carried out in two different group settings: (a) involving only the subject and (b) involving the subject and another adult family member (preferably spouse) of the subject.

In all, 54 three-day training sessions were conducted to cover all the subjects. The financial literacy scores of each subject in the treatment group were measured one-month after the completion of the training through the same OECD-INFE questionnaire used for the pre-experiment survey. The questionnaires were administered to the subjects at their residence.

The treatments (training sessions) were carried out by individuals who had been specially trained for the purpose. They hailed from the three districts covered by the study and were well-versed in local language. Before the study began, the trainers were given four-day long training to cover various aspects of the study including: (a) importance and concepts underlying financial literacy, (b) approach of the study and OECD-INFE questionnaire, (c) material for and approach to the training sessions and (d) critical sources of bias in field studies. The session-wise coverage of principles of personal and household finance are given in Table 2.⁵

⁵The basic modules on each of the topics, including the movies and games were obtained from ISMW for use in the experiments with prior approval.

Table A-2: Training Modules

Session	Topic	Contents
Day-1	Fundamentals of financial planning	(a) The role of planning in avoiding costly borrowings, (b) Behaviour of incomes and expenditures through life cycle, (c) Analysis of household incomes and expenditures, including the identification of financial needs into short-term and long-term and (d) Need for the timely use of savings, credit, and insurance.
Day-1	Savings	(a) Introduction of various options savings, (b) Assessment of saving options based on accessibility, interest and safety and (c) Formalities involved in operating savings bank accounts.
Day-2	Borrowings	(a) Sources of borrowing, (b) Estimation of effective interest cost of borrowings and (c) Comparison of borrowing options, and procedures involved in borrowing.
Day-2	Spending	Participants were given various narratives of households to avoid wasteful household expenditure
Day-3	Investments	(a) Introduction to various opportunities for long-term investments and (b) Features of investments and criteria for comparison, process of managing fixed deposits
Day-3	Insurance	(a) Introduction to importance of insurance products, (b) Introduction of various insurance products available, and (c) Comparison of insurance products
Day-3	Pensions	(a) Role of pensions in household welfare and (b) Various pensions schemes available
Day-3	Budget	(a) Role of household budgets in securing the financial welfare of households and (b) Various steps involved in the preparation of realistic household budgets

Annexure 3: The OECD-INFE Instrument for Measuring Financial Literacy

The OECD-INFE (Organization for Economic Cooperation and Development, International Network on Financial Education) define financial literacy as, “A combination of awareness, knowledge, skill, attitude and behavior necessary to make sound financial decisions and ultimately achieve individual financial well being.”⁶ The OECD-INFE definition has been used for surveys on financial literacy across several countries⁷ and was also used in our earlier survey of financial literacy in India.⁸ In the OECD-INFE definition, financial knowledge, financial behavior and financial attitude are three independent dimensions representing three different aspects of financial literacy:

1. The level of financial knowledge is measured using a set of eight questions to capture their basic numeracy and understanding of computation of simple and compound interest (time value of money), relationship between inflation and return, inflation and prices, risk and return, and the role of diversification in risk reduction. Each correct answer is given a score of one. Respondents with a score of six and above are categorized as individuals possessing high financial knowledge; respondents with scores of four and five are categorized as individuals with average financial knowledge; the rest are categorized as possessing poor financial knowledge.⁹
2. Financial behavior is measured through response to questions that pertain to how respondents deal with money in their daily lives. A total of eight items are used to unravel whether the respondents assess affordability of products and expenditures, make timely payment of bills, practice long-term financial planning and monitor household budget and financial affairs, make efforts to evaluate financial products and habitually engage in the act of saving and borrowing. The response to each question is given a score of one if it indicates desirable financial behavior; zero otherwise. Respondents with a score of six and above are categorized as those demonstrating positive financial behavior; respondents with scores of four and five are classified as those demonstrating average financial behavior; the rest are categorized as demonstrating indifferent financial behavior.

⁶Written consent was received from the OECD for using the OECD-INFE Core Questionnaire and Guidance Notes on April 2, 2012. The two questionnaires used for the OECD financial literacy survey approach are:

OECD-INFE (2011). “Measuring financial literacy: Core questionnaire in measuring financial literacy: Questionnaire and guidance notes for conducting an internationally comparable survey of financial literacy”. Paris: OECD.

OECD-INFE (2012). “Supplementary questions: Optional survey questions for the OECD-INFE financial literacy core questionnaire”. Paris: OECD.

⁷Atkinson, A. and Messy, F. (2012). “Measuring financial literacy: Results of the OECD / International Network on Financial Education (INFE) pilot study”. OECD Working Papers on Finance, Insurance and Private Pensions No. 15, OECD Publishing.

⁸Agarwalla, S. K., Barua, S. K., Jacob, J. and Varma, J. R. (2012) “A Survey of Financial Literacy among Students, Young Employees and Retired in India”, Indian Institute of Management, Ahmedabad.

⁹The method of scoring and categorization for the response variables is based on the method used by Atkinson and Messy (2012) cited earlier.

3. Financial attitude of respondents is measured using three items to capture the respondents' extent of belief in planning, propensity to save and propensity to consume. Respondents with an average score of three or above across the three items are categorized as those with positive financial attitude; respondents with a score of two or less are categorized as possessing indifferent financial attitude; the rest are categorized as possessing average financial attitude.

Financial literacy is measured as the sum of scores in the three dimensions – knowledge, behaviour and attitude. The maximum score possible for financial literacy is 21 (eight for financial behavior, eight for financial knowledge, and five for financial attitude) and the minimum score is zero.



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