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A Study on Profiles of Trainees and their Progress during and after a Pilot Training Program

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ABSTRACT

We trained twelve female unskilled workers through a pilot training program(SREACT) as semiskilled mason in just four days of training spaced over a period of 45-days. All the trainees passed a third party government test to qualify as assistant mason with four days (about 30 hours) of training. They represent a mix of young mothers to grand mothers, age ranging from 24 to 50 with education varying from iliterate to high school educated. The study on their progress during and after training program is made in individual cases and sub groups to understand their progress and profiles. We could see uniqueness in each individual cases and also some commonality between them in their progress during and after training.

Keywords: *female, unskilled workers, pilot, training, mason, progress, profile study, India*

1. INTRODUCTION

One of a major reason for poverty is loss of income or under productivity or unemployment. Fortunately, in India, it seems that unemployment is low and there are possibilities to improve productivity by training unskilled workers and youth entering various job market [1,2,3] and to enhance income. An attempt was made to pilot train female unskilled workers to the level of assistant mason [3,4], which experience could be translated to whole of the country and to other nations as a successful case of training of workers. However, much is required to be understood on various barriers to train the workers and how these female workers cope up actual training. Therefore an attempt is made to understand the learning or progress of these female trainees during and after training. This paper attempts quantitative methods and analysis of the data collected during and after training.

2. LITERATURE REVIEW

Annette Barnabas et. al. [5] conducted a study on construction workers and report on number of barriers and recommed that women construction workers should be trained as mason, although they didn't train any female construction workers as mason.They stress that there is a clear gender bias in training of women.

SEWA [6] outline life of construction female workers as having tough working schedule, getting up early, cooking, fetching water, readying family, walking long distances searching for jobs, having head load of construction job, back home cooking evening meals and

settling finally to seek at least 5 to 6 hours of sleep in a day. They have also given training to female workers, their memebers as mason through non-formal training. However, detailed documenttaion of exact training and replicating of this successful method is to be spread across the country. UNISON, UK [7] also have similar training programs for its members, however more focus is only on union advocacy rather than on work skill developments.

Purushottam Vankar et. al. [8] studied on development trends of construction workers in Gujarat for SEWA and report that the unskilled workers are losing out the battle to skilled workers in fast changing technology and advancement of new technology and machinery. Our training of rural youth and workers from tsunami affected area [9,10] indicate that untrained workers and female unskilled workers stay away from any work training and skill upgradations, so suitable interventions are very much needed as in line with observations made by Annette Barnabas et. al. [5].

3. PROPOSED DESIGN

A pilot training program was conducted for skill development of female unskilled workers of construction industry who were primarily agriculture labourer to the level of assistant masons under Modular Employable Skill (MES) of Government of India[11]. Feedbacks, observations and data were collected before, during and after the training. These data are studied and analysed as a case study [4]. This paper deals in additional studies made on the available data. Microsoft Excel Worksheet functions are used for anlysis, particularly the LINEST function for regression analysis is used.

4. RESULTS AND DISCUSSIONS

Table-1 shows the final test scores awarded by Construction Industry Development Council (CIDC) of India along with demographic data age, experience, education etc.

Table-1, Trainees final score as awarded by CIDC as dependent variable taken with age, education, experience etc as independent variables for multiple regression analysis

Trainee roll no	age in no. of years	education in no of years of studies	total experience in no. of years	constrion experience in no. of years	trade skill level self stated, 1=Unskilled, 2=semi skilled, 3=skilled	age at which started to work	CIDC final test score
				Variables			
	(X1)	(X2)	(X3)	(X4)	(X5)	(X6)	(Y)
1	25	10	0	0	1	25	85
2	50	0	10	2	2	30	70
3	33	6	4	0	2	28	85
4	40	5	20	2	1	20	77
5	45	5	10	0	2	35	72
6	30	0	0	0	2	20	77
7	30	5	10	1	1	20	78
8	24	9	0	0	2	24	85
9	36	5	4	2	1	30	80
10	30	5	2	0	1	30	75
11	26	0	10	0.5	1	14	81
12	38	3	8				77

The multiple regression analysis of data of Table-1 excluding roll no.12, gives the following results:

1) Regression Equation (excluding roll no.12, who joined the training only on second day) is given by Y= 89.639 - 0.660X1 + 0.605X2 + 0.107X3 + 2.297X4 + 3.956X5 + 0.0155X6;
2) Age and test score are inversly related;
3) The coefficient of determination, r^2 is 0.802 and the 'F-Test' indicate statistical significance at 5% level and
4) The 't-Test' for contribution by individual variables, X1 to X6 indicate statistical non-significance at 5% level.

Regression analysis is done for two groups of age 30 and below, and above age of 30 for data given in Table-1. The results are as given below:

1) Regression Equation is given by Y=119.502-1.430X1 for age 30 & below; Y=110.769-0.841X1 for age above 30;
2) age and test score are inversly related in both cases;
3) The coefficient of determination, r^2 are 0.91 & 0.93 for below 30 and above 30 age cases and in both cases the 'F-Test' indicate statistical significance at 5% level ;
4) The 't-Test' for contribution by individual variable age in both cases indicate statistical significance at 5% significance;
5) Although the scatter diagram with line estimate for age vs. test score when plotted shows some shift as between the younger and old generation workers, however the 't-Test' shows no significant difference as between their means at 5% level.

Regression analysis is done for education vs final CIDC score for values shown in Table-1, which yields:

1) Regression Equation is given by Y=74.514+0.902X2 ;
2) Education and test score are directly related
3) The coefficient of determination, r^2 is only 0.354 and the 'F-Test' indicate statistical significance at 5% level and
4) The subgroups show very interesting results, the iliterate and primary school group show practically vertical line fit and the high school group show a flat horizantal line fit.

Regression analysis was done for variable X3, total years of experience including agriculture and construction experience. The regression line is given by $y = -0.374x + 80.93$ and $R^2 = 0.204$. Here also years of experience is negatively related to final CIDC score and the F-test for coeeficent of determination at 5% level is insignificant. Qualitatively, we can expect each trainee to be average, above and below average of this regression line at given range of work experience.

A 't-Test' was carried out for two groups for their differences in total score with respect to variable X5, self rating of skill level before start of any training. We have only two groups, one unskilled, another semi skilled and the t-Test at 5% significance level shows that there is no significant difference between them. Alternatively, we can state that both categories of trainees have equally performed well in the final CIDC test.

The variable, X6, the age at which each trainee entered job market is analyzed for regression fit with the final CIDC score. The results show that the polinomial curve can be given as $y = 0.003x^4 - 0.347x^3 + 12.53x^2 - 193.2x + 1148$ and $R^2 = 0.755$, where 'x' can be taken as variable X6. The F-Test for coeeficient of detrmination at 5% level shows borderline significance. The first order relation with this variable is inversly proportional, however as they enter at tender age and at late age, their performance is low as compared to entry age of 24 to 26, note this interpretation is made qualitativelly. The trainee at roll no. 11 has entered the workforce at the age of 14, then a child labour.

Table-2 shows progress made by trainees during training and after training. Progress variables X7 to X13 are shown as independent against CIDC final score as dependant variable. Variable X7 indicate outcome first two day training, but measured based on simple individual task given at end of day-2. Variable X8, X9 and X10 represent a feedback obtained from trainees just before start of the training and after end of 4-days training; X8 indicates number of items what they have learnt, X9 indicates number items that they would have already learnt before coming to the training and X10 indicates items unlearnt, error or confusion. Variables X11, X12 and X13 are based on feedbacks obtained after about 5 moths since training and test was completed to assess the impact of the training, both in terms of individual approach and opportunities in their place and industries.

The multi regression analysis was done (excluding roll no. 12) and the regression equation is given by, Y=126.336 + 0.104X7 - 5.066X8 - 4.670X9 + 3.862X11 + 5.021X13 (coefficients for X10 & X12 are zero) and the coefficeient of determination is given by r^2 = 0.579. The F-Test at 5% level shows that correlation is statiscally not significant. The 't-Test for individual contributions of the independent variables indicate not significant at 5% level. Under clumn X8, X9 and X10 a total of 17 items were considered, where X8 corresponds to training outcome, X9 can be taken as items already known to trainees before they came for training. After training, all the trainees can be expected to reach an even platform, hence variation within CIDC test score appear to be less. The values appearing under column X13 is disturbing as maximum values are seen which is almost uniform to all trainees, indicating further support to the trainees in motivating them and to get suitable jobs.

Table-2, Trainees final score as awarded by CIDC of India as dependent variable with independent variables

Trainee roll no	Individual score on day2, construction of a small wall	positive progress as favourable change due to training on no. of items on 4th day	neutral of progress as no change due to training on no. of items on 4th day	negative progress as un-favourable change due to training on no. of items on 4th day	progress after_five_months_positive	progress after_five_months_netural	progress after_five_months_negative	CIDC final test score
Variables	(X7)	(X8)	(X9)	(X10)	(X11)	(X12)	(X13)	(Y)
1	76	13	3	1	2	0	4	85
2	74	5	12	0	0	2	4	70
3	72	1	14	2	1	1	4	85
4	74	5	12	0	1	1	4	77
5	78	10	7	0	2	0	4	72
6	78	14	2	1	1	1	4	77
7	82	8	9	0	0	1	5	78
8	80	11	5	1	3	0	3	85
9	80	2	15	0	2	1	3	80
10	82	17	0	0	2	0	4	75
11	73	9	8	0	0	1	5	81
12	74				0	1	5	77

Variable X1 to X13 along with final test scores of CIDC give unique profile of each trainee. Further, Table-3 shows their self-assessment or rating of each lesson learnt on a ten-point scale. This has also served as a tool for self-reflection on the learning outcome.

The average self rating score is taken with CIDC score for regression analysis. The line is given by Y = 45.041 + 3.727X , where X is the average self rating score and the coefficient of detrmination r^2 = 0.324. However the F-Test indicate that it is not significant at 5% level.

Table-3, Trainees Self Rating of Skills Attained during each practical lesson

Roll No.	L1	L3	L4	L9	L10	L11	L14	average	CIDC_test_score
1	10	10	10	10	10	10	10	10.0	85
2	7	6	10	10	8	9	9	8.4	70
3	7	10	9	9	8	8	10	8.7	85
4	10	10	10	10	10	10	10	10.0	77
5	5	10	9	9	7	7	7	7.7	72
6	5	10	10	10	10	10	10	9.3	77
7	9	10	10	10	7	7	10	9.0	78
8	10	10	10	10	9	10	9	9.7	85
9	8	10	10	10	10	10	10	9.7	80
10	6	8	8	10	8	9	8	8.1	75
11	6	10	9	9	7	8	10	8.4	81

Although we could expect positive relation with higher the age, education and experience, we have observed negative relation or regression cofficients and that too in many cases statistically not significant. This can be explained by the facts that skill training is not taking place however the number of years of experience, the female workers have been asked to manual jobs and never given any training [5], or only very few get trained [5,6,7,8]. In similar argument, we can expect age also get addedup without skill development, so a negative correlation of age with CIDC final score or performance is indicated. Whereas in the case of education, we find the trainees who have just completed primary or secondary education have lost reading touch and they have dififculty in freely writing and reading. Where they are more ed ucated, they find the manual job not interesting and less motivated. However depending on their motivation and opportunity, their performance could be expected better than the rest. There are indications that if the trainees are younger and educated they outperform the elder and iliterate. However, in our pilot training program, as Howthorne Effect was reported and training was practical oriented, all the categories of trainees performed well.

5. CONCLUSION

Trainee's age, education and experience collectivelly contribute to the final training outcome, which can be expected further in their work performance. The pilot training program has successfully trained female workers with different age, education and experience background and all have practically performed in the final third party test, equally well.

The trainees have obtained Trained Assistant Mason certificate just with four days training and in course of time, we could expect them to acquire more skills. However, the impact study conducted after about five months indicate barriers to be removed and supports to be given on continuos basis.

The pilot training program can be replicated both in the same trade and in other trades, which can be taken up for future research.

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