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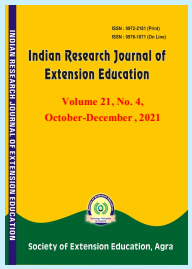

Impact of Informative Videos on Farmers' Adoption of Wheat Production Technologies in Punjab, India

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ABSTRACT

The study entitled "impact of informative videos on farmers' adoption of recommended wheat production technologies in Punjab, India" was undertaken with the objective to assess the impact of informative videos on the extent of adoption of recommended practices for wheat cultivation by the farmers of Punjab, India. A multi-stage sampling procedure followed by a quasi-experimental designs that use pre and post tests and control group was used on 240 respondents. Four informative videos on recommended wheat practices viz. seed treatment, weed management, integrated nutrient management and safe use of agrochemicals were selected as treatments in the study. Primary data was generated between September and October 2019 using structured interview schedule. The data were analyzed using frequency, percentages, t-test, paired t-test and z-test. The results show that before exposure to the informative videos, there non-significant differences were existed in terms extent of adoption of recommended practices of wheat crop between control and experimental group. However, after exposure to the videos significant differences in extent of adoption were observed between experimental and control group. The study recommends that videos can be used as an effective medium of transferring agricultural information, enhancing the adoption of recommended technologies among the farming community.

Keywords: *Impact; Informative video; Extent of adoption; Quasi experimental design; Pre and post test.*

Agricultural development is considered one of the most powerful gear to end poverty, uplift apportion prosperity and feed underfed people. Growth in agriculture sector raises income of the poorest people that can provide sufficient food and nutrition. Agriculture also accounts for one-third of the global gross domestic product (GDP) which is very imperative for economic growth (*World Bank, 2014*). India being the country of 1.35 billion people requires more than 2000 million tons of food grain. Here, agriculture and allied activities contribute the most (33%) to the GDP (*Khatkar et al 2016*). Thus, for sustainable agricultural growth, there is a need for regular flow of technological interventions from research institutions to extension system and there upon to end users i.e. farmers. Adoption of appropriate crop management practices of irrigation, fertilization, weed management, crop residue management in wheat growing zone have no table contribution in harnessing the yield potential of new improvement *(Kumar et al 2014*). Indian farmers face regular changes in environmental conditions, which make information not only useful, but obligatory to stay competitive (*Jacobsen, 1987*). Lack of good extension services and poor access to data has hindered the exchange of innovation at the farm level. The new technique or other farm information needs to reach the farmers from a

researcher through the appropriate media. Timely and appropriate information is considered as an important factor which leads to change in behavior of receivers.

Although there are number of communication technologies available but video is the most effective medium to convey information in an attractive way and also effectively supports educational efforts (*Rani & Rao, 2014*). Understanding audiences' preference for receiving certain message type as well as factors, such as consumer needs, moods, attitude or tastes help to determine which media source to use (*Webster & Ksiazek, 2012*). The message from videos reaches the mind of the audience through eyes and ears thus motivate the people for adoption of new technologies by changing their attitude *(Pandian et al 2002*). *Weinschenk (2013)* also expressed that video are the persuasive form of communication as the faces, voices, movements, emotions, etc. depicted in the videos are rich in information and inherently attract human attention. Videos as a mean of delivering educational content can be produced with minimal resources and thus can be cost effective (*Tuong et al 2014*). Sharing of videos through social media can reach large number of audience in a nick of time, thus making them an effective mean of information sharing (*Backinger et al 2011*). *Zossou et al 2009* also observed that sharing of new ideas, information and new technologies with farmers through videos become a favored and new approach of dissemination. According to *Banerjee, 2011*, the advanced communication technologies are subsumed in the extension field for self-subsistent development of farmers in rural areas and providing them self-reliance and decision-making power. *Mayer, 2002* noticed that visuals shared with verbal descriptions boost learning. Recordings of videos makes adapting a lot simpler when thoughts are communicated in visual structure and such visual introduction conquers the hindrance of absence of education and language (*Coldevin, 2003*). The video allows the public to see too small objects that cannot be seen in a cohesive way (*Rotman & Preece, 2010*). The video can be used to reflect the way in which actions are performed and to stimulate thinking about how peers can imitate and change their lives (*Barron, 2007*).In overall, it can be considered that videos can play vital role in creating awareness, developing motivation and to enhance adoption of improved practices among the viewers. Thus, the present investigation was planned to see the impact of informative videos on farmers' adoption of recommended wheat production technologies in Punjab, India.

METHODOLOGY

The study was conducted in Ludhiana district of Punjab. In this study multistage sampling was followed in which two blocks of the district were randomly selected. From these selected blocks, three villages from each block, one as control and two as experimental villages were randomly selected. Thus a total of six villages were selected for the study. From each selected village, forty (40) wheat growers were randomly selected, thus 160 respondents were selected as experimental and 80 respondents as control group for the study. In the present study, Quasi-experimental design was employed to estimate the impact of informative videos on extent of adoption productivity and economic returns of the respondents from wheat crop. As the Punjab Agricultural University, Ludhiana has developed varieties of informative videos for disseminate innovations, technologies and information among farmers. Thus, in order to see the impact of these videos on adoption of various recommended practices in wheat crop, videos showing practices of seed treatment, weed management, integrated nutrient management and safe use of agrochemicals were selected as treatments to conduct this experimental study. Important critical practices in each informative video were identified and transferred into statements with the help of extensive review of literature and thorough discussion with the experts. Then after checking their reliability and validity, these statements were administered to the respondents before and after exposure to videos as well as to the control group in order to know the extent to which the respondents were following these practices during the cultivation of the crop. Each statement was given 1 score if it is in toto followed by the respondents. Thus for each informative video a total adoption score was worked out and extent of adoption categories were made on the basis of the mean ± standard deviation score. The total adoption score was categorized into three categories of the extent of adoption i.e. low, medium and high. The effect of treatment was measured by subtracting the change in the dependent variable in the control area from the change in the dependent variable in experimental area.

The quasi experimental design can be shown in the following way:

Type of group	Before exposure to treatment		After exposure to treatment
Exp. group	Level of occurrence (X)	Introduction of treatment	Level of occurrence (Y)
Control group	Level of occurrence without treatment (A)		Level of occurrence without treatment (Z)
Effect of treatment= (Y-X)- (Z-A)			

For the data collection three stages contacts were made i.e., before treatment, at the time of treatment (video exposure) and after the treatment in order to assess the impact of informative videos on extent of adoption, productivity and economic returns. Every individual respondent was personally interviewed. Proper precautions were taken in order to get unbiased responses from the respondents. Thus, prior to data collection the respondents were made aware about the objectives of the study. Although the research instrument was prepared in English, however the respondents were elucidated in local dialect i.e. Punjabi at the time of interview. The obtained responses were further recorded on interview sheet, then coded with some numerical values and filled in MS Excel sheets. Then these Excel sheets were subjected to SPSS for data analysis. The statistical tools used for the analysis and interpretation of the data were mean, standard deviation, frequency, percentage, Z –test, paired 't' test and 't' test for two independent samples.

RESULTS AND DISCUSSION

In the present investigation efforts were made to assess the impact of informative videos on extent of adoption of wheat production technologies by employing quasi experimental design. In this design the experimental group was exposed to the selected informative videos whereas the control group was used as check in order to nullify the effect of confounding variables. Pre and post test evaluations are made in both the groups and the findings are presented under the following sub-heads:

*Experimental and control group according to their extent of adoption before and after exposure to the seed treatment vide*o : The data given in Table 1 show that incase of experimental group before exposure to the informative video there were 41.3 per cent of the respondents having low, half were having medium and 8.1 per cent respondents were having high level of adoption of recommended practices regarding seed treatment in wheat crop. However, after exposure to the videos the proportion of respondents decreased by 17.5 per cent in low, increased by 6.89 per cent in middle and 10.6 in high level of adoption category. In the same span of time in post test evaluation of control group, it was observed that only 3.75 per cent increase in percentage of respondents was observed in high adoption level category which was found to be non significant.

Impact of seed treatment video on the extent of adoption of recommended seed treatment practices: The data in Table 2 show that before exposure to the video there was non-significant difference in mean scores of adoptions in experimental and control group. Whereas after exposure to the seed treatment video a significant difference was observed in mean scores of experimental (6.83 ± 2.37) and control group (4.90 ± 3.57). Impact of informative videos on extent of adoption was also calculated as an effect of treatment which was found to be 1.21. Thus it could be concluded that exposure of videos brought significant changes in the adoption score of the respondents. The results of the study are in line with the results of *Vasilaky et al (2015*) who reported that there was increase in rate of adoption by 0.05 for those individuals' who were exposed to Digital Green videos, whereas the average rate of adoption was seen in the control group. This could be because the video influenced respondents in better manner, which had eventually improved respondents' mental acceptance of the seed treatment technology.

Extent of adoption before and after exposure to weed management video : From the perusal of Table 3 it can be inferred that incase of experimental group before exposure to the informative video nearly 57 per cent of the respondents belonged to low extent of adoption category followed by 36.2 per cent to medium and 10.6 per cent to high category of extent of adoption.

However, after exposure to the informative videos 11.8 per cent decrease in proportion of respondents was observed in low extent of adoption category of experimental group which was found to be significant at 0.05 level, whereas in case of control group a non-significant percentage shift was observed in extent of adoption category. From these findings it can be concluded that video presentation as an educational tool had successfully pushed for adoption of recommended practices. This may be due to the fact that the

Table 1. Distribution of respondents in experimental and control group according to their extent of adoption before and after exposure to seed treatment video

Type of informative content in video	Extent of adoption	Experimental group (n=160)				Control group (n= 80)			
		Before No, (%)	After No, (%)	% shift	'z' test	Before No, (%)	After No, (%)	% shift	'z' test
Seed treatment	Low (<4.55)	66(41.3)	38(23.7)	- 17.5	3.34*	41 (51.2)	38 (47.5)	-3.75	0.47
	Medium (4.55-6.90)	81(50.6)	92(57.5)	+ 6.89	1.23	33 (41.2)	33 (41.2)	0.00	0.00
	High (>6.90)	13(8.1)	30(18.7)	+ 10.6	2.79*	6 (7.5)	9 (11.2)	+3.75	0.81

*significant at 0.05

Table 2. Comparison of adoption means score in experimental and control group as well as before and after exposure to seed treatment video

Type of informative video	Time	Experimental (n=160) Extent of adoption MS±SD	Control (n= 80) MS ±SD	Difference	't' value
Seed treatment	Before	5.50 ± 2.82(X)	4.78 ± 3.61(A)	0.72	1.69
	After	6.83 ± 2.37(Y)	4.90 ± 3.57(Z)	1.93	4.99 *
	Difference	1.33	0.12		
	paired 't' test	4.57*	1.92		

Effect of treatment (Y-X)- (Z-A) = 1.21

*Significant at 0.05

Table 3. Distribution of experimental and control group according to the extent of adoption before and after exposure to weed management video

Type of informative content in video	Extent of adoption	Experimental group (n=160)				Control group (n= 80)			
		Before No, (%)	After No, (%)	% shift	'z' test	Before No, (%)	After No, (%)	% shift	'z' Test
Weed management	Low (<3.15)	92(57.5)	73(45.7)	- 11.8	2.12*	43(53.7)	37(46.2)	- 7.50	0.94
	Medium(3.15-6.67)	51(31.9)	61(38.1)	+6.25	1.17	29(36.2)	34(42.5)	+6.25	0.81
	High (>6.67)	17(10.6)	26(16.2)	+5.63	1.47	8(10.0)	9(11.2)	+1.25	0.26

*Significant at 0.05

respondents became aware about the practical application of new technologies through videos.

Impact of weed management video on the extent of adoption of recommended weed management : The data given in Table 4 reveal that exposure of the weed management video to experimental group (5.76 ± 2.35) in comparison to control group (4.77 ± 1.26) resulted in significantly enhancing the adoption of recommended weed management practices. The calculated effect of treatment on adoption of recommended practices was found to be 1.36. The results are in line with the results of *Haider, (2014)* and *Sarker et al (2014).*

Experimental and control group according to their extent of adoption before and after exposure to integrated nutrient management video : From the findings presented in Table 5 show that incase of experimental group before exposure to the informative video half of the respondents had low extent of adoption followed by 36.9 per cent had medium and only 10.0 per cent of the respondents had high extent of adoption of recommended practices. However after exposure to the informative videos to experimental group a significant decrease (10.6) in percentage of respondents in low extent of adoption category was observed. At the same time percent shift in control group extent of adoption categories was found to be non significant.

Impact of integrated nutrient management video on the extent of adoption of nutrient management : The findings given in Table 6 reveal that before exposure to the informative video there was non- significant difference between adoption mean score of experimental and control group.

Table 4. Comparison of adoption means score in experimental and control group as well as before and after exposure to weed management video

Type of informative video	Time	Experimental (n=160) Extent of adoption MS±SD	Control (n= 80) MS ±SD	Difference	't' value
Weed management	Before	4.27 ± 2.08(X)	4.64 ± 1.76(A)	0.37	1.36
	After	5.76 ± 2.35(Y)	4.77 ± 1.26(Z)	0.99	3.52*
	Difference	1.49	0.13		
	paired 't' test	6.01*	0.79		

Effect of treatment (Y-X)- (Z-A) = 1.36

*Significant at 0.05

Table 5. Distribution of Experimental and Control group according to the extent of adoption before and after exposure to integrated nutrient management video

Type of informative content in video	Extent of adoption	Experimental group (n=160) Before No, (%)	After No, (%)	% shift	'z' test	Control group (n= 80) Before No, (%)	After No, (%)	% shift	'z' test
Integrated nutrient management	Low (<3.95)	85(53.1)	68(42.5)	- 10.6	1.96*	42(52.5)	39(48.7)	- 3.75	0.47
	Medium (3.95-7.05)	59(36.9)	70(43.7)	+6.9	1.25	31(38.7)	32(40.0)	+1.25	0.16
	High (>7.05)	16(10.0)	22(13.7)	+3.7	1.04	7(8.7)	9(11.2)	+2.50	0.53

*Significant at 0.05

Table 6 Comparison of adoption means score in experimental and control group as well as before and after exposure to integrated nutrient management video

Type of informative video	Time	Experimental (n=160) Extent of adoption MS±SD	Control (n= 80) MS ±SD	Difference	't' value
Integrated nutrient management	Before	4.74± 2.03(X)	5.02 ± 2.47(A)	0.28	0.93
	After	6.58 ± 2.15(Y)	5.35 ± 2.46(Z)	1.23	3.97*
	Difference	1.84	0.33		
	paired 't' test	7.87*	0.85		

Effect of treatment (Y-X)- (Z-A) = 1.51

*Significant at 0.05

However after the exposure of informative video to the experimental group, the adoption means scores for both the groups were calculated and it is found that in case of experimental group the average adoptions score (6.58 ± 2.15) was significantly higher as compared to the control group (5.35 ± 2.46). The calculated effect of treatment on adoption of recommended practices was found to be 1.51.

Experimental and control group according to their extent of adoption before and after exposure to safe use of agrochemical video : From the findings of Table 7, it can be observed that incase of experimental group about 47 per cent of the respondents belonged to low extent of adoption category for safe handling practices of agrochemicals followed by 38.8 per cent medium and 14.4 per cent to high extent of adoption category. However, after exposure the informative video 35 per cent of the respondents were falling in low, 41.2 per cent in medium and 23.7 per cent in high extent of adoption category. Thus, in the experimental group a significant shift of -11.9 per cent in low and +9.38 per cent of respondents in high extent of adoption categories was observed. Whereas incase control group non significant percentage shift of respondents was observed in extent of adoption categories.

Impact of safe use of agrochemical video on the

Table 7. Distribution of experimental and control group according to the extent of adoption of agrochemicals video

Type of informative content in video	Extent of adoption	Experimental group (n=160)				Control group (n= 80)			
		Before No, (%)	After No, (%)	% shift	'z' test	Before No, (%)	After No, (%)	% shift	'z' test
Safe use of agro-chemicals	Low (<4.72)	75(46.9)	56(35.0)	- 11.9	2.16*	41(51.2)	39(48.7)	- 2.50	0.32
	Medium (4.72-7.38)	62(38.8)	66(41.2)	+ 2.50	0.45	24(30.0)	26(32.5)	+ 2.50	0.34
	High (>7.38)	23(14.4)	38(23.7)	+ 9.38	2.13*	15(18.7)	15(18.7)	0.00	0.00

*Significant at 0.05

Table 8. Comparison of adoption means score in experimental and control group as well as before and after exposure to safe use of agrochemicals video

Type of informative video	Time	Experimental (n=160) Extent of adoption MS±SD	Control (n= 80) MS ±SD	Difference	't' value
Safe use of agrochemicals	Before	5.26 ± 3.76(X)	5.15 ± 2.20(A)	0.11	0.24
	After	7.42 ± 2.17(Y)	5.76 ± 3.31(Z)	1.66	4.65*
	Difference	2.16	0.61		
	paired 't' test	6.29*	1.37		

Effect of treatment (Y-X)- (Z-A) = 1.55

*Significant at 0.05,

extent of adoption of safe use of agrochemical practices : The results presented in Table 8 illustrate that before exposure to the informative video there was non- significant difference between adoption mean score of experimental (5.26 ± 3.76) and control group (5.15 ± 2.20). However after the exposure of informative video to the experimental group, the mean score (7.42 ± 2.17) in case of experimental group was found to be significantly higher as compared to the control group (5.76 ± 3.31). The calculated effect of treatment on adoption of recommended practices was found to be 1.55. The findings are similar with *Vasilaky et al (2015)* who recorded an increase in adoption rate of about 50 per cent between treatment and control groups.

Experimental and control group according to their extent of adoption before and after exposure to the selected informative videos : The results given in Table 9 show the distribution of respondents according to combined effect of all selected informative videos on extent of adoption. From the findings, it can be observed that incase of experimental group 11.3 per cent of the respondents were falling in low, 75.0 per cent were falling in medium and after exposure to the informative 13.8 per cent were falling in high extent of adoption category.

However, after exposure of the group to all selected informative videos 2.5 per cent of the respondents were falling in low, 62.5 per cent were falling in medium and 35.0 per cent were falling in high to extent of adoption category in experimental group. These percentage shifts were found to be significant at $p<0.05$ level, whereas in case of control group a non significant percentage shift was observed in post test evaluation.

Combined impact of all the selected informative videos on the extent of adoption of improved cultivation practices of wheat crop by the respondents : The findings given in Table 10 reveal that before exposure to the informative videos there was non- significant difference between adoption mean score (19.4 ± 10.1) of experimental and control group (19.28 ± 12.62). However after the exposure of informative videos to the experimental group, the means scores for both the groups were calculated and it is found that in case of experimental group the average adoptions score (25.2 ± 8.09) was significantly higher as compared to the control group (19.63 ± 11.56). The calculated effect of treatment on adoption of recommended practices was found to be 5.45.

The findings are in line with the findings of the *Fancy (2015), Chowdhury et al (2015)* & *Shely (2016)* who also concluded that farmers perceive videos

Table 9. Overall distribution of Experimental and Control group according to the extent of adoption before and after exposure to informative videos

Type of informative content in video	Extent of adoption	Experimental group (n=160)				Control group (n= 80)			
		Before No, (%)	After No, (%)	% shift	'z' test	Before No, (%)	After No, (%)	% shift	'z' test
Recommended practices of wheat crop	Low (<14.9)	18(11.3)	4(2.5)	- 8.75	3.09*	23(28.7)	22(27.5)	- 1.25	0.17
	Medium (14.9-27.8)	120(75.0)	100(62.5)	-12.50	2.41*	38(47.5)	37(46.2)	- 1.25	0.16
	High (>27.8)	22(13.8)	56(35.0)	+21.2	4.43*	19(23.7)	21(26.2)	+2.50	0.36

*significant at 0.05,

Table 10. Comparison of adoption means score in experimental and control group as well as before and after exposure to informative videos

Type of informative video	Time	Experimental (n=160) Extent of adoption MS±SD	Control (n= 80) MS ±SD	Difference	't' value
Recommended practices of wheat crop	Before	19.4 ± 10.1(X)	19.28 ± 12.62(A)	0.12	0.08
	After	25.2 ± 8.09(Y)	19.63 ± 11.56(Z)	5.57	4.33*
	Difference	5.8	0.35		
	paired 't' test	5.67*	0.18		

Effect of treatment (Y-X)- (Z-A) = 5.45

*Significant at 0.05,

positively and they found these as efficient tool to encourage farmers towards adoption of new agricultural technologies.

CONCLUSION

The study provides evidence that videos have a high potential to augment adoption of technologies. Videos could be used as an effective medium for dissemination of information among farmers in order to increase their knowledge level as well as to enhance the adoption of improved practices. It can be concluded that the informative videos viz. seed treatment, weed management, integrated nutrient management and safe use of agrochemicals were highly effective with respect to extent of adoption towards recommended wheat production technologies. This indicates that educational videos can be developed on different recommended technologies and preferentially shared among farmers for quick extent of adoption. This may eventually lead to enhance the rate of adoption of improved practices thus enabling farmers to attain higher productivity with minimum resources.

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