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ASSESSMENT OF FARMERS' LEARNING STYLES AND THEIR IMPLICATIONS FOR AGRICULTURAL EXTENSION TEACHING METHODS

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Abstract
Farmers differ considerably in the ways they acquire, process and apply agricultural information. Understanding these learning preferences is essential for designing effective and farmer-centred extension education programmes. The present study was undertaken to assess the learning styles of farmers and to identify suitable extension teaching methods corresponding to different learning styles. Farmers' learning styles were assessed using four broad categories, namely Converger/Pragmatist, Diverger/Reflector, Assimilator/Theorist, and Accommodator/Activist**.** A rank-ordering approach was used to identify the relative preference of farmers for the different learning styles. Among small and marginal farmers, Converger/Pragmatist emerged as the prominent learning style, whereas Accommodator/Activist was the predominant learning style among large farmers. Based on the identified learning styles, suitable extension teaching methods were recommended. Practical methods such as on-farm demonstrations, trials and farm visits were suggested for Converger/Pragmatist learners; discussion and audio-visual methods for Diverger/Reflector learners; conceptual and information-oriented methods for Assimilator/Theorist learners; and participatory and experiential methods for Accommodator/Activist learners. The findings highlight the importance of considering farmers' learning preferences while planning extension education and communication programmes. A combination of practical, reflective, conceptual and participatory teaching approaches can help extension personnel provide more farmer-centred learning opportunities.

Keywords: Farmers, learning styles, Converger, Diverger, Assimilator, Accommodator, extension teaching methods, agricultural extension

INTRODUCTION

Agricultural extension plays an important role in facilitating the transfer of agricultural knowledge, technologies and skills from research and development institutions to farmers. The effectiveness of extension education depends not only on the availability of quality information but also on the ability of farmers to understand, process and apply that information in their farming situations. Farmers are not a homogeneous group and they differ in their experiences, knowledge, attitudes, resources and preferred ways of learning. Therefore, understanding farmers' learning preferences is important for designing appropriate extension teaching and communication strategies. Learning is a continuous process through which individuals acquire knowledge, skills, attitudes and experiences. In agricultural situations, farmers learn through several channels, including observation, experimentation, discussion, demonstrations, interpersonal interaction, mass media and their own farming experiences. Some farmers may prefer learning by doing and experimenting, whereas others may prefer observing an activity, discussing it with others or understanding the theoretical basis before applying it. These differences can be broadly understood through the concept of learning styles.

The experiential learning approach provides a useful framework for understanding such differences. Based on the manner in which individuals perceive and process experiences, learning preferences can be represented through four broad categories**:** Converger/Pragmatist, Diverger/Reflector, Assimilator/Theorist and Accommodator/Activist. Converger/Pragmatist learners generally prefer practical application and problem-solving. Diverger/Reflector learners tend to emphasize observation, reflection and consideration of different perspectives. Assimilator/Theorist learners prefer logical explanations, concepts and systematic information. Accommodator/Activist learners generally prefer active participation, experimentation and learning through direct experience.

In agricultural extension, identifying these differences can help extension personnel select teaching methods that are more compatible with farmers' learning preferences. For instance, demonstrations, field trials and farm visits can provide opportunities for practical learning, while discussions, interviews and audio-visual materials can facilitate

observation and reflection. Similarly, graphs, statistics and conceptual explanations can support farmers who prefer analytical learning, whereas role plays, simulations, group discussions and problem-solving activities can encourage active learning. The conventional extension approach often emphasizes the use of standard teaching methods for a heterogeneous farming population. However, a farmer-centred extension system requires greater attention to the diversity of farmers and their individual learning preferences. Understanding learning styles can therefore contribute to better selection and combination of extension teaching methods. Against this background, the present study was undertaken to assess and rank the learning styles of farmers and identify suitable extension teaching methods corresponding to different learning styles. The study specifically compared the learning style preferences of small and marginal farmers with those of large farmers and examined their implications for planning effective extension education programmes.

MATERIALS AND METHODS

The study was conducted in Jogulamba Gadwal district of Telangana State using an ex-post facto research design, as the learning preferences of the farmers were studied under naturally existing conditions without manipulating any independent variables. The design was considered appropriate for assessing the existing differences in learning styles among different categories of farmers. Jogulamba Gadwal district comprises 12 mandals, out of which Gadwal and Dharoor mandals were purposively selected based on their maximum area under paddy cultivation during the Rabi season. From each selected mandal, one village was selected randomly, namely Gurramgadda from Gadwal mandal and Chintharevula from Dharoor mandal, which had a relatively higher area under paddy cultivation during Rabi. From each selected village, 80 farmers were selected randomly, comprising 40 small and marginal farmers and 40 large farmers. Thus, a total of 160 farmers, consisting of 80 small and marginal farmers and 80 large farmers, were selected from the two villages and interviewed using a structured interview schedule for assessing their learning styles. Farmers' learning styles were assessed using a structured learning-style schedule developed/adapted for the purpose of the study. The schedule classified the respondents into four broad learning-style categories, namely Converger/Pragmatist, Diverger/Reflector, Assimilator/Theorist, and Accommodator/Activist, representing different ways through which farmers acquire, process, reflect upon and apply agricultural information and experiences. The respondents were asked to indicate their preferences for the identified learning styles following the prescribed scoring procedure. The scores obtained for each learning style were used to determine the relative preference of the farmers and the learning styles were subsequently rank ordered based on the learning-style scores. Separate rank ordering was carried out for small and marginal farmers and large farmers to identify differences in their learning-style preferences. The frequency and percentage of respondents under each rank were calculated and the results were used to identify the predominant learning styles among the two categories of farmers.

Statistical Analysis

The collected data were tabulated and analysed using frequency, percentage and rank-ordering techniques. Frequencies and percentages were used to describe the distribution of farmers across the different ranks, while rank ordering was used to identify the relative prominence of the four learning styles among small and marginal farmers and large farmers.nThe findings were interpreted to determine differences in learning preferences between the two farmer categories and to develop suitable recommendations for selection of extension teaching methods.

RESULTS AND DISCUSSION

The distribution of farmers according to their preferred learning styles across five ranks is presented in the table 1. The four learning styles considered were Converger/Pragmatist, Diverger/Reflector, Assimilator/Theorist, and Accommodator/Activist. The findings indicate considerable variation in the ranking of learning styles between small and marginal farmers and large farmers.

Among small and marginal farmers (n=80), the Converger/Pragmatist learning style occupied the first rank, with 33 farmers (41.25 per cent) assigning it Rank 1. It was followed by Diverger/Reflector, with 25 farmers (31.25 per cent), while Assimilator/Theorist and Accommodator/Activist were each ranked first by 14 farmers (17.50 per cent).

With respect to Rank 2, Diverger/Reflector was preferred by 20 farmers (25.00 per cent), followed by Accommodator/Activist with 15 farmers (18.75 per cent), Converger/Pragmatist with 10 farmers (12.50 per cent), and Assimilator/Theorist with 8 farmers (10.00 per cent).

At Rank 3, Assimilator/Theorist was the most frequently reported learning style, accounting for 33 farmers (41.25 per cent), followed by Accommodator/Activist with 25 farmers (31.25 per cent), Diverger/Reflector with 13 farmers (16.25 per cent), and Converger/Pragmatist with 17 farmers (21.25 per cent).

For Rank 4, Accommodator/Activist accounted for 18 farmers (22.50 per cent), followed by Converger/Pragmatist and Diverger/Reflector with 15 farmers each (18.75 per cent), while Assimilator/Theorist was reported by 12 farmers (15.00 per cent). At Rank 5, Assimilator/Theorist was reported by 13 farmers (16.25 per cent), followed by Accommodator/Activist with 8 farmers (10.00 per cent), Diverger/Reflector with 7 farmers (8.75 per cent), and Converger/Pragmatist with 5 farmers (6.25 per cent).

Among large farmers (n=80), Accommodator/Activist emerged as the most frequently assigned Rank 1, with 36 farmers (45.00 per cent). It was followed by Assimilator/Theorist with 26 farmers (32.50 per cent), Diverger/Reflector with 17 farmers (21.25 per cent), and Converger/Pragmatist with 10 farmers (12.50 per cent).
For Rank 2, Converger/Pragmatist was reported by 20 farmers (25.00 per cent), followed by Assimilator/Theorist with 11 farmers (13.75 per cent), Diverger/Reflector with 13 farmers (16.25 per cent), and Accommodator/Activist with 8 farmers (10.00 per cent). At Rank 3, Diverger/Reflector was the most prominent, with 22 farmers (27.50 per cent), followed by Converger/Pragmatist with 23 farmers (28.75 per cent), Assimilator/Theorist with 17 farmers (21.25 per cent), and Accommodator/Activist with 11 farmers (13.75 per cent). For Rank 4, Diverger/Reflector was reported by 20 farmers (25.00 per cent), followed by Converger/Pragmatist with 17 farmers (21.25 per cent),

Table 1. Rank ordering of learning styles based on farmers learning style scores

	Small and marginal farmers (n=80)					**Large farmers n=80**				
Learning styles	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5	Rank 1	Rank 2	Rank 3	Rank 4	Rank 5
	F %	F %	F %	F %	F %	F %	F %	F %	F %	F %
a) Converger/Pragmatists	33 (41.25)	10 (12.50)	17 (21.25)	15 (18.75)	5 (6.25)	10 (12.50)	20 (25.00)	23 (28.75)	17 (21.25)	10 (12.50)
b) Diverger/Reflectors	25 (31.25)	20 (25.00)	13 (16.25)	15 (18.75)	7 (8.75)	17 (21.25)	13 (16.25)	22 (27.50)	20 (25.00)	8 (10.00)
c) Assimilator/Theorist	14 (17.50)	8 (10.00)	33 (41.25)	12 (15.00)	13 (16.25)	26 (32.50)	11 (13.75)	17 (21.25)	12 (15.00)	14 (17.50)
d) Accommodator/Activist	14 (17.50)	15 (18.75)	25 (31.25)	18 (22.50)	8 (10.00)	36 (45.00)	8 (10.00)	11 (13.75)	16 (20.00)	9 (11.25)

Accommodator/Activist with 16 farmers (20.00 per cent), and Assimilator/Theorist with 12 farmers (15.00 per cent). Under Rank 5, Assimilator/Theorist was reported by 14 farmers (17.50 per cent), followed by Accommodator/Activist with 9 farmers (11.25 per cent), Converger/Pragmatist with 10 farmers (12.50 per cent), and Diverger/Reflector with 8 farmers (10.00 per cent).
The findings reveal a clear difference in the dominant learning preferences of the two categories of farmers. Small and marginal farmers predominantly preferred the Converger/Pragmatist style, indicating a greater inclination towards learning through practical application, problem-solving and the direct use of information in farming situations. Their relatively high preference for the Diverger/Reflector style also suggests that observation, reflection and learning from experiences may be important components of their learning process.
In contrast, large farmers predominantly preferred the Accommodator/Activist style, suggesting a stronger inclination towards learning through direct involvement, experimentation and practical experience. The relatively high representation of the Assimilator/Theorist style among large farmers also indicates an interest in understanding concepts, technical information and logical explanations before applying them in farm situations.
The differences may be associated with the nature and scale of farming operations. Small and marginal farmers often operate under resource constraints and may therefore place greater emphasis on practical, immediately applicable knowledge and problem-solving approaches. Large farmers, having relatively greater resources and potentially greater

exposure to improved technologies, demonstrations and commercial farming practices, may be more inclined towards experimentation, active participation and systematic understanding of technical information.

The results have important implications for agricultural extension programmes. A single method of extension teaching may not adequately address the learning preferences of all categories of farmers. For small and marginal farmers, extension personnel may give greater emphasis to method demonstrations, hands-on training, farmer-to-farmer learning, problem-solving exercises and practical examples. For large farmers, field experimentation, adaptive trials, technical discussions, demonstrations and participatory learning activities may be particularly useful.

Overall, the findings indicate that learning-style differences should be considered while designing farmer training and extension communication programmes. Combining practical demonstrations, experiential learning, observation, discussion and technical explanations can help accommodate the diverse learning preferences of both small and marginal farmers and large farmers.

The identified learning styles were presented in table 2, with suitable extension teaching methods to facilitate more effective farmer learning. The recommended methods were classified into four categories: Converger/Pragmatist, Diverger/Reflector, Assimilator/Theorist, and Accommodator/Activist. The results and discussion are presented below.

Table 2: Extension Teaching Methods recommended based on the findings of the study relevant to learning styles

Sl. No.	**Identified Learning styles**	**Extension Teaching methods recommended**
1	Converger/Pragmatists	On-farm demonstrations, on-farm trails, Front line demonstrations, Case studies, Result demonstrations, Method demonstrations,Minikit trails, Farm &Home visits.
2	Diverger/Reflectors	Paired discussion, Self-analysis questionnaires,observing activities, Interviews, Agricultural film shows, Puppet shows, Video clippings, Agricultural CD and DVD's
3	Assimilator/Theorist	Success stories, News stories, Statistics, Graphs, Conceptual ideas, Brainstorming, Quotes, Applying theories
4	Accommodator/Activist	Panel discussion, Discovery method, Role play,Brainstorming, Dramas, Probem solving, Simulation games, Puzzles, Competitions, Group discussions, Group meetings.

The findings revealed that each learning style requires a different combination of extension teaching methods to effectively facilitate learning among farmers. Converger/Pragmatist learners were associated with methods that emphasize practical application, experimentation and direct field experience. Accordingly, on-farm demonstrations, on-farm trials, front-line demonstrations, case studies, result demonstrations, method demonstrations, minikit trials and farm and home visits were recommended. These methods enable farmers to observe technologies under actual field conditions and understand their practical application.

For Diverger/Reflector learners, methods emphasizing observation, reflection, interaction and sharing of experiences were recommended. Paired discussions, self-analysis questionnaires, observation of activities, interviews, agricultural film shows, puppet shows, video clippings, and agricultural CDs and DVDs were identified as suitable methods. These approaches provide opportunities for farmers to observe different situations, reflect on their experiences and exchange ideas with others. For Assimilator/Theorist learners, extension methods focusing on conceptual understanding, logical information and systematic presentation of knowledge were recommended. These included success stories, news stories, statistics, graphs, conceptual ideas, brainstorming, relevant quotations and application of theories. Such methods can help farmers understand the underlying principles and relationships associated with agricultural technologies and practices.

For Accommodator/Activist learners, methods involving active participation, experimentation, problem-solving and group interaction were recommended. Panel discussions, discovery methods, role play, brainstorming, dramas, problem-solving exercises, simulation games, puzzles, competitions, group discussions and group meetings were

identified as appropriate approaches. These methods encourage active involvement and learning through experience. The findings suggest that extension teaching methods should be aligned with the learning preferences of farmers rather than relying exclusively on a single method of communication. Different farmers may respond differently to the same extension intervention depending on whether they prefer practical experience, observation and reflection, conceptual understanding, or active participation.

The Converger/Pragmatist learning style is particularly compatible with experiential and field-oriented extension methods. Demonstrations, trials and farm visits allow farmers to see the performance of a technology and assess its applicability under their own farming conditions. Such methods can bridge the gap between theoretical recommendations and actual farm practice. The Diverger/Reflector style is better supported by methods that provide opportunities for observation and reflection. Discussions, interviews, films and video-based approaches can expose farmers to different experiences and encourage them to compare new information with their existing knowledge and farming experiences. These methods may also facilitate peer learning and experience sharing. The Assimilator/Theorist style can be effectively supported through information-rich and concept-oriented methods. Statistics, graphs, success stories and conceptual explanations can help farmers understand the technical basis of recommended practices. Presenting information in a systematic manner can also assist farmers who prefer to analyse information before adopting a particular technology.

The Accommodator/Activist style requires greater emphasis on participation and learning by doing. Role plays, group discussions, discovery learning, simulations, competitions and problem-solving activities provide opportunities for farmers to actively participate rather than merely receive information. Such approaches can be particularly useful in participatory extension programmes where farmers are encouraged to identify problems and develop solutions collectively. Thus, the table provides a learning-style-based framework for selecting extension teaching methods. The findings imply that extension personnel should use a combination of demonstration, discussion, audio-visual, analytical and participatory methods rather than depending on one approach. Matching teaching methods with farmers' learning preferences can make extension communication more participatory, experiential, understandable and farmer-centred, thereby improving the potential effectiveness of training and technology-transfer programmes.

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