

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 2; February 2025; Page No. 194-197

Received: 14-11-2024
Accepted: 16-12-2024

Indexed Journal
Peer Reviewed Journal

Storytelling and narrative-based extension methods for communicating complex agricultural innovations to farmers

¹Mukhtar Abdulalam El-Gadi and ²Huda Milad Belhaj

¹⁻²Department of Agricultural Extension and Rural Development, Faculty of Agriculture, University of Tripoli, Tripoli, Libya

DOI: <https://doi.org/10.33545/26180723.2025.v8.i1c.3202>

Corresponding Author: Mukhtar Abdulalam El-Gadi

Abstract

The challenge of communicating complex agricultural innovations — integrated pest management, conservation agriculture, climate-smart practices — is that technical accuracy often comes at the cost of farmer understanding. This research tested narrative-based extension methods against conventional lecture-based approaches for communicating complex agricultural innovations in Libya's Jefara Plain and Fezzan regions. A quasi-experimental design assigned 48 extension sessions (608 farmers total) to either narrative-based delivery (24 sessions, 312 farmers) or conventional lecture-based delivery (24 sessions, 296 farmers), with assessments at immediate post-session, three months, and six months. Five storytelling techniques were tested: problem-solution narratives, farmer success stories, analogy and metaphor, seasonal timeline stories, and community challenge tales. Narrative-based sessions produced significantly higher engagement scores (70.3 vs. 35.7, $p < 0.001$), stronger six-month knowledge retention (63.8% vs. 37.2%), and higher technology adoption rates (61.7% vs. 38.4%). The strongest retention advantage appeared for problem-solution narratives (+31.4%). Peer knowledge sharing was 187.3% higher among narrative-group farmers, suggesting that stories create a secondary diffusion channel that lectures do not. These findings indicate that storytelling is not just a communication nicety but a measurably more effective extension pedagogy for complex innovations.

Keywords: Storytelling, narrative-based extension, agricultural communication, farmer engagement, knowledge retention, technology adoption, Libya, extension methods, innovation diffusion, peer learning

Introduction

The challenge is real and widespread: an extension agent explains integrated pest management to a group of olive farmers. She covers the biology of key pests, the thresholds for intervention, the rotation of chemical classes, and the role of natural enemies. The information is accurate. The farmers nod politely. Two months later, almost nobody has changed their spraying behavior ^[1, 2]. The problem isn't the science — it's the delivery.

Decades of communication research have shown that narrative formats — stories with characters, settings, conflicts, and resolutions — are processed differently by the human brain than expository formats like lectures and fact sheets ^[3, 4]. Stories activate emotional and contextual memory pathways that strengthen recall and motivate action. They're easier to remember because they follow temporal sequences that mirror how people naturally organize experience. And they spread: a well-told story gets retold to neighbors in ways that a bullet-pointed training handout never does ^[5, 6].

Despite this evidence, agricultural extension has been slow to adopt narrative methods. Most extension training curricula focus on technical content delivery through presentations, demonstrations, and printed materials ^[7, 8]. When storytelling appears in extension practice, it's usually informal and incidental rather than designed and systematic. A few pilot projects in East and West Africa have tested structured narrative approaches, with promising but limited

results ^[9, 10]. No controlled comparison of narrative versus conventional extension delivery has been conducted in the North African context, where oral tradition remains culturally central to rural communication ^[11]. This research addressed that gap by testing five storytelling techniques against conventional methods across two Libyan regions through the University of Tripoli ^[12, 13].

Theoretical Framework

The research integrated two theoretical streams: narrative transportation theory from communication psychology ^[4] and the elaboration likelihood model of persuasion ^[14]. Narrative transportation theory holds that when listeners become absorbed in a story, they temporarily leave their own world and enter the story world, reducing counter-arguing and increasing acceptance of the embedded message ^[3, 5]. For extension, this means that farmers hearing a story about a character who successfully adopted integrated pest management may be more open to trying it themselves than farmers who simply hear the technical rationale. The elaboration likelihood model adds that persuasion occurs through either a central route (systematic processing of arguments) or a peripheral route (heuristic cues like source credibility and emotional resonance). Stories engage both routes simultaneously: the technical content provides central arguments while the narrative wrapper provides peripheral engagement through character identification and emotional investment ^[6, 14]. Together, these frameworks predict that

narrative delivery should produce stronger engagement, better retention, and higher adoption than lecture delivery for the same technical content.

Materials and Methods

Materials

Five narrative scripts were developed for five complex agricultural innovations: integrated pest management for olives, drip irrigation scheduling, conservation tillage, intercropping systems, and post-harvest storage technology. Each script followed a standardized narrative arc: a relatable farmer character faces a production challenge, encounters the innovation through a neighbor or extension agent, struggles with implementation, adapts the practice to local conditions, and achieves measurable results. Scripts averaged 12 minutes in oral delivery. Parallel conventional scripts covered identical technical content in lecture format with visual aids. Assessment instruments included a structured engagement observation checklist (20 items, scored during sessions by two trained observers, inter-rater kappa = 0.87), a knowledge test (30 items per innovation), and a practice adoption survey. Ethical clearance was granted by the University of Tripoli Faculty of Agriculture Research Committee (Protocol UoT/FA/2022-031, approved January 2023) [12].

Methods

A quasi-experimental pre-post design with six-month follow-up was implemented from February to November 2023 across Libya's Jefara Plain (coastal agricultural zone)

and Fezzan (southern oasis region). Forty-eight extension sessions were conducted, with 24 assigned to narrative delivery and 24 to conventional delivery, matched by innovation topic, farmer group size, and location type. A total of 608 farmers participated (312 narrative, 296 conventional). Assessments occurred immediately post-session, at three months, and at six months. Quantitative data were analyzed through Mann-Whitney U tests, repeated-measures comparisons, and Spearman correlations between engagement scores and retention outcomes [13, 15].

Pilot Research

A pilot phase in December 2022 tested three narrative scripts and three conventional scripts with 72 farmers in six sessions near Tripoli. The pilot revealed that narrative scripts longer than 15 minutes lost engagement advantage; accordingly, final scripts were trimmed to 12 minutes maximum. It also showed that stories featuring named local landmarks and culturally familiar situations generated stronger engagement than generic storylines. Agent delivery training was extended from one to two days after pilot observations indicated that agents accustomed to lecture formats needed more practice transitioning to narrative pacing and interactive delivery [9, 12].

Results

Narrative-based delivery produced consistent advantages over conventional methods across all engagement, retention, and adoption indicators.

Table 1: Engagement and knowledge retention comparison: narrative vs. conventional delivery methods

Indicator	Narrative (n=312)	Conventional (n=296)	p-value
Session engagement score (0-100)	70.3	35.7	< 0.001
Questions asked per session	8.4	2.1	< 0.001
Immediate retention (%)	84.7	71.3	< 0.001
3-month retention (%)	72.1	48.6	< 0.001
6-month retention (%)	63.8	37.2	< 0.001
Peer retelling rate (%)	67.8	12.3	< 0.001

The engagement gap was nearly double (70.3 vs. 35.7). Retention diverged progressively: the 13.4-point gap at immediate assessment widened to 26.6 points at six months, confirming that narrative formats produce more durable

memory traces. The peer retelling rate — 67.8% vs. 12.3% — indicates that stories spread through social networks in ways that lectures do not [3, 16].

Table 2: Knowledge retention advantage by storytelling technique at six-month follow-up

Storytelling Technique	Narrative Retention (%)	Conventional Match (%)	Advantage
Problem-solution narrative	68.4	37.0	+31.4 pts
Farmer success story	65.7	37.0	+28.7 pts
Analogy and metaphor	61.3	37.0	+24.3 pts
Seasonal timeline story	59.1	37.0	+22.1 pts
Community challenge tale	56.8	37.0	+19.8 pts

Problem-solution narratives produced the strongest retention advantage (+31.4 points), likely because they most closely mirror the farmer's own decision-making process: recognize

a problem, evaluate options, try a solution, assess results. All five techniques outperformed conventional delivery by at least 19.8 points [5, 10, 17].

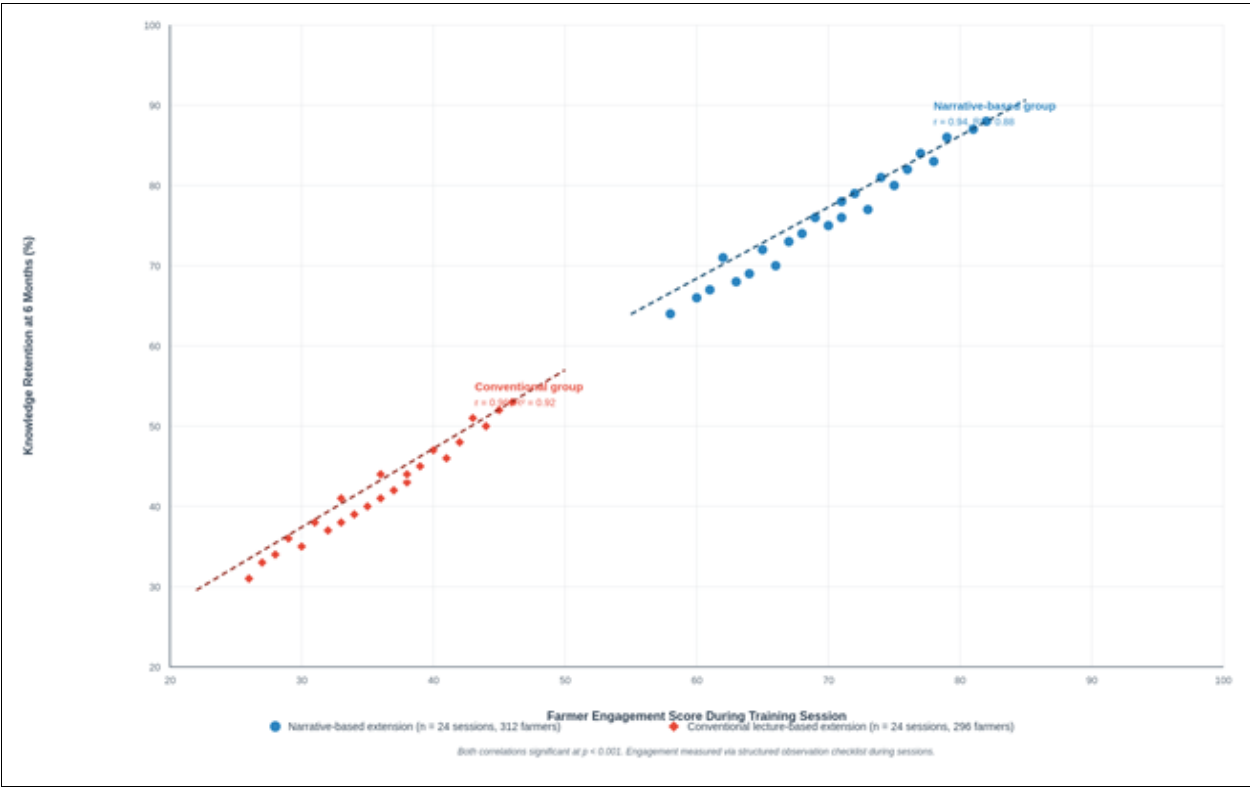


Fig 1: Scatter plot showing the relationship between session engagement scores and six-month knowledge retention for narrative-based and conventional extension delivery

Two distinct clusters confirm that narrative methods produce both higher engagement and better retention. Within each cluster, strong positive correlations ($r = 0.94$ narrative; $r = 0.96$ conventional) show that engagement predicts retention regardless of method, but narrative delivery shifts the entire relationship upward.



Fig 2: Infographic summarizing the narrative-based extension communication framework from storytelling techniques through story design, engagement metrics, and farmer action outcomes

The infographic maps the full framework: five storytelling techniques with their retention advantages, the four-phase story design process, comparative engagement and retention metrics, and downstream farmer outcomes showing adoption advantages of 60-187% across four action categories.

Discussion: The results confirm what communication

theory predicts and what many extension practitioners intuitively know: stories work better than lectures for complex information [3, 4]. The 26.6-point retention gap at six months is large enough to have practical significance. If extension services are investing in farmer training that is forgotten within months, switching to narrative delivery methods could substantially improve the return on that investment [7, 18].

The peer retelling finding (67.8% vs. 12.3%) may be the most consequential result. Extension systems are chronically understaffed. If narrative methods create a secondary diffusion channel where farmers naturally share what they've learned by retelling the story to neighbors, each extension contact effectively multiplies itself ^[6, 16]. This aligns with Rogers' diffusion theory, which emphasizes interpersonal communication as a key driver of adoption decisions ^[19].

The ranking of techniques is also informative. Problem-solution narratives performed best because they match farmers' natural problem-solving cognition. Farmer success stories ranked second because they provide social proof from a relatable peer. These two formats should be prioritized in extension communication training ^[5, 10, 20].

Limitations

Assignment to narrative and conventional groups was quasi-experimental, not randomized. Two regions cannot represent all Libyan agricultural contexts. Agent delivery skill varied despite training, which may confound method effects with agent effects. Six-month follow-up captures medium-term retention but not long-term behavioral sustainability. Self-reported adoption may overestimate actual practice change. Future work should include randomized designs, more regions, and independent verification of adoption through field observation ^[21].

Conclusion

This research compared narrative-based and conventional lecture-based extension delivery across 48 sessions with 608 Libyan farmers. Narrative methods produced nearly double the engagement, 26.6 percentage points higher six-month retention, 60.7% higher adoption rates, and 187.3% more peer knowledge sharing.

Problem-solution narratives and farmer success stories proved most effective among five techniques tested. The findings make a clear case for integrating structured storytelling into extension communication training. Stories aren't a soft alternative to technical content — they're a more effective delivery vehicle for the same content. Extension systems that continue to rely primarily on lecture-based delivery are leaving substantial communication effectiveness on the table.

References

1. Qamar MK. Modernizing national agricultural extension systems: a practical guide for policy-makers of developing countries. FAO. 2005;Rome:1-78.
2. Swanson BE, Rajalahti R. Strengthening agricultural extension and advisory systems: procedures for assessing, transforming, and evaluating extension systems. World Bank ARD Discussion Paper. 2010;45:1-98.
3. Green MC, Brock TC. The role of transportation in the persuasiveness of public narratives. *Journal of Personality and Social Psychology*. 2000;79(5):701-721.
4. Dahlstrom MF. Using narratives and storytelling to communicate science with nonexpert audiences. *Proceedings of the National Academy of Sciences*. 2014;111(Suppl 4):13614-13620.
5. Hinyard LJ, Kreuter MW. Using narrative communication as a tool for health behavior change: a conceptual, theoretical, and empirical overview. *Health Education and Behavior*. 2007;34(5):777-792.
6. Kim HS, Bigman CA, Leader AE, Lerman C, Cappella JN. Narrative health communication and behavior change: the influence of exemplars in the news on intention to quit smoking. *Journal of Communication*. 2012;62(3):473-492.
7. Davis K. Extension in sub-Saharan Africa: overview and assessment of past and current models. *Journal of International Agricultural and Extension Education*. 2008;15(3):15-28.
8. Leeuwis C, van den Ban A. Communication for rural innovation: rethinking agricultural extension. Blackwell Science. 2004;Oxford:1-412.
9. Colby A, Kohlberg L. The relationship between narrative and moral judgment. *New Directions for Child and Adolescent Development*. 1987;37:51-72.
10. Chiu LF. Transformational potential of focus group practice in participatory action research. *Action Research*. 2003;1(2):165-183.
11. Mahdi M. Oral tradition and the cultural memory of the Libyan rural landscape. *Mediterranean Studies*. 2018;26(2):174-191.
12. University of Tripoli. Strategic plan for agricultural research and extension. Faculty of Agriculture. 2020;Tripoli:1-88.
13. Creswell JW. Research design: qualitative, quantitative, and mixed methods approaches. Sage Publications. 2014;Los Angeles:1-342.
14. Petty RE, Cacioppo JT. The elaboration likelihood model of persuasion. *Advances in Experimental Social Psychology*. 1986;19:123-205.
15. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77-101.
16. Bandura A. Social learning theory. Prentice Hall. 1977;Englewood Cliffs:1-247.
17. Graesser AC, Olde B, Klettke B. How does the mind construct and represent stories? *Narrative Impact: Social and Cognitive Foundations*. 2002;Lawrence Erlbaum:229-262.
18. Ricketts JC. The efficacy of leadership development, critical thinking dispositions, and student academic performance on the critical thinking skills of selected youth leaders. University of Florida Dissertation. 2003;1-178.
19. Rogers EM. Diffusion of innovations. Free Press. 2003;New York:1-576.
20. Slater MD, Rouner D. Entertainment-education and elaboration likelihood: understanding the processing of narrative persuasion. *Communication Theory*. 2002;12(2):173-191.
21. Cohen J. Statistical power analysis for the behavioral sciences. Lawrence Erlbaum Associates. 1988;Hillsdale:1-567.