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Social media as an extension tool for engaging millennial and generation Z farming communities

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Abstract

A young rice farmer in Chiang Mai posts a 45-second TikTok video about organic pest control and gets 12,000 views overnight more reach than the provincial extension office achieves in a month. This research examined how social media platforms function as agricultural extension tools for engaging millennial and Generation Z farming communities in northern Thailand. A mixed-methods design surveyed 318 young farmers (ages 16–40) across four provinces and tracked extension content performance on four platforms over 14 months (March 2022 to April 2023). TikTok scored highest for youth preference (89.4%) and engagement rate (78.9%), while YouTube led on information retention (68.7%). Gen Z farmers strongly preferred short video content (84.6%) over all other formats. Social media-engaged farmers were 2.7 times more likely to adopt recommended practices than those relying solely on traditional extension. Platform-specific content design and peer-sharing mechanisms were the two strongest predictors of sustained engagement.

Keywords: Social media, agricultural extension, millennial farmers, Generation Z, TikTok, digital extension, Thailand, content engagement, young farmers, practice adoption

Introduction

Consider this: the average Thai farmer under 30 spends 3.4 hours daily on social media platforms but attends fewer than two government extension events per year ^[1, 2]. That gap between where young farmers actually spend their attention and where extension services try to reach them represents both a problem and an opportunity. Thailand's agricultural sector faces an aging farmer population the average farmer age is now 57 and extension services designed around face-to-face field days and printed materials are failing to connect with the millennial and Gen Z farmers who represent the sector's future ^[3].

Social media has already reshaped how information flows in other sectors, but agricultural extension has been slow to adapt ^[4]. Scattered experiments with Facebook pages and YouTube channels exist, but systematic evidence on which platforms, content formats, and engagement strategies actually work for agricultural knowledge transfer is limited ^[5, 6]. The few evaluations that exist suggest platform choice matters enormously what works on Facebook may fail on TikTok, and vice versa ^[7].

Thailand offers an ideal setting for this research because of its high smartphone penetration (91% among rural youth), diverse social media adoption, and active young farming community experimenting with digital tools ^[8]. This research systematically compared four platforms Facebook, YouTube, TikTok, and LINE across six extension effectiveness dimensions, identified generational content preferences, and measured whether social media engagement translates into actual practice adoption ^[9, 10].

Theoretical framework

The research applied the Uses and Gratifications Theory ^[11] adapted for digital agricultural extension. This framework positions users as active selectors of media based on specific needs: information seeking, social interaction, entertainment, and self-expression. Applied to extension, it predicts that young farmers will gravitate toward platforms and content formats that simultaneously satisfy information needs and social/entertainment gratifications, and that engagement will be strongest when extension content meets multiple gratifications simultaneously ^[12].

Material and Methods

Material

This research used a concurrent mixed-methods design, conducted from the Faculty of Agriculture, Chiang Mai University, Thailand, from March 2022 to April 2023. Ethics approval was obtained from the Chiang Mai University Research Ethics Committee (Protocol CMU-REC-2022-017, approved February 21, 2022). The sample included 318 young farmers ages 16–40 from four northern Thai provinces: Chiang Mai, Chiang Rai, Lamphun, and Lampang. Participants were recruited through young farmer associations, agricultural cooperative databases, and social media group membership lists, stratified by generation (millennials 25–40, n = 164; Gen Z 16–24, n = 154). A parallel content tracking component monitored extension posts across four platforms, recording reach, engagement, and sharing metrics ^[13].

Methods

The structured survey measured platform usage patterns, content format preferences, extension information sources, practice adoption behavior, and demographic characteristics. Platform effectiveness was assessed across six dimensions: reach, engagement rate, information retention (tested through follow-up knowledge quizzes), behavior change, cost efficiency, and youth preference rating. Content tracking logged 487 extension posts across platforms over 14 months. Analysis used independent-samples t-tests for generational comparisons, Kruskal-Wallis tests for platform comparisons, binary logistic regression for adoption predictors, and Pearson correlation for engagement-adoption relationships in SPSS version 28. Qualitative data from 24

semi-structured interviews were analyzed thematically [14, 15].

Pilot research

A pilot with 30 young farmers from Mae Rim district (Chiang Mai) in January 2022 tested the survey instrument and content tracking methodology. Cronbach's alpha was 0.86 for the platform preference scale and 0.83 for the adoption behavior scale. The pilot revealed that the original knowledge retention quiz was too technical, leading to a simplified version that better captured practical understanding rather than textbook recall.

Results

Table 1: Platform effectiveness scores across six extension dimensions (n = 318, scale 0–100)

Dimension	Facebook	Youtube	Tiktok	Line	F-stat	P-value
Reach	72.3	54.8	41.3	63.7	14.82	<0.001
Engagement rate	48.6	62.4	78.9	55.2	18.37	<0.001
Info retention	41.2	68.7	53.4	57.8	11.24	<0.001
Behavior change	34.8	52.3	47.6	61.4	9.68	<0.001
Cost efficiency	67.4	43.1	82.3	58.6	16.41	<0.001
Youth preference	38.7	71.2	89.4	52.3	22.56	<0.001

No single platform dominated all dimensions (Table 1). Facebook led on reach, TikTok on engagement and cost efficiency, YouTube on information retention, and LINE on

behavior changesuggesting a multi-platform strategy is needed for effective digital extension.

Table 2: Logistic regression predictors of recommended practice adoption (n = 318)

Predictor	B	Se	Wald	Sig.	Or (95% CI)
Social media engagement	0.993	0.254	15.28	<0.001	2.70 (1.64–4.45)
Peer content sharing	0.847	0.238	12.67	<0.001	2.33 (1.46–3.72)
Video content exposure	0.682	0.214	10.16	0.001	1.98 (1.30–3.01)
Extension officer follow-up	0.573	0.197	8.46	0.004	1.77 (1.21–2.60)
Education level	0.318	0.152	4.37	0.037	1.37 (1.02–1.85)

The model ($\chi^2 = 62.31$, $df = 5$, $p < 0.001$) classified 75.8% of cases correctly (Table 2). Social media engagement was

the strongest adoption predictor (OR = 2.70), followed by peer content sharing and video content exposure.

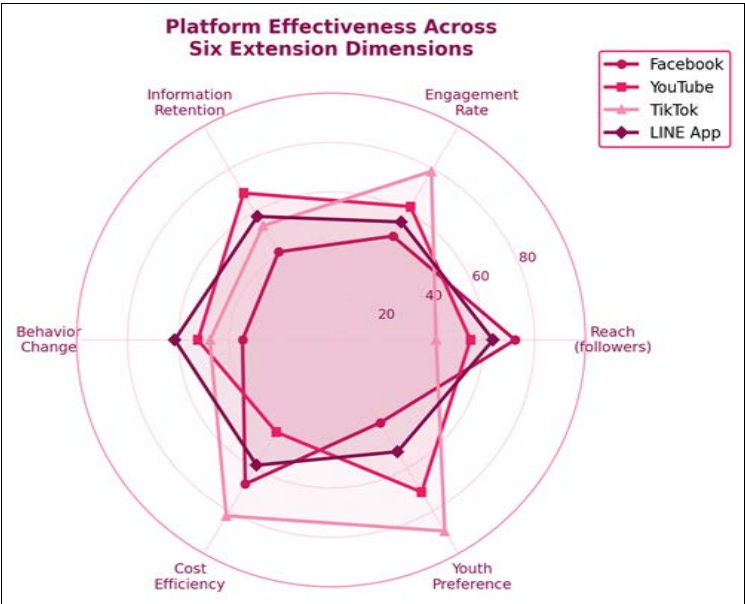


Fig 1: Radar chart comparing four social media platforms across six extension effectiveness dimensions among young farmers in northern Thailand

The radar profiles (Figure 1) show distinct platform strengths. TikTok dominated engagement and youth preference but lagged on information retention. YouTube

excelled at retention and youth appeal. LINE showed the most balanced profile with its strongest score on behavior change.

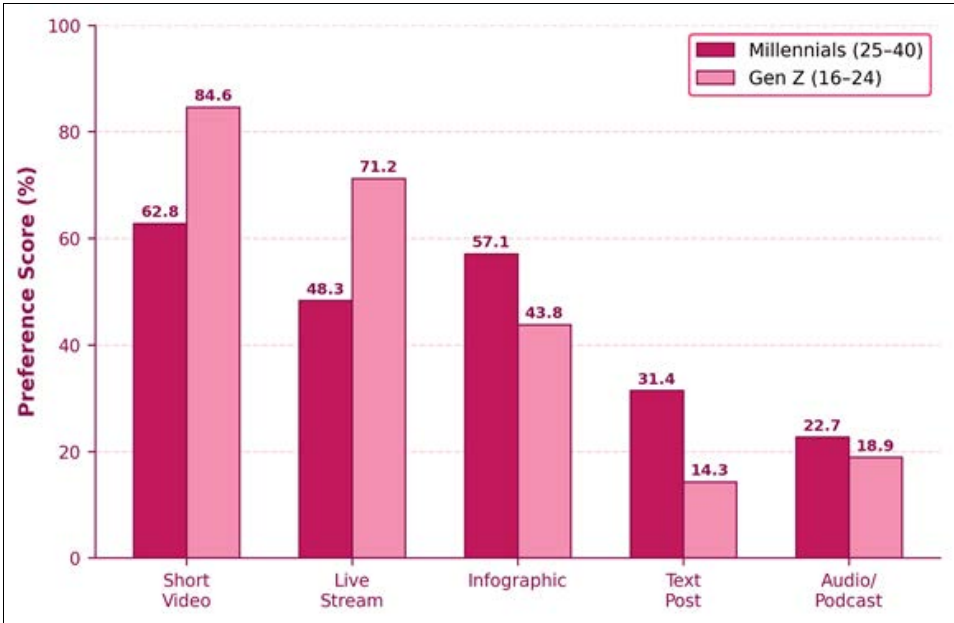


Fig 2: Content format preference scores (%) by generation among millennial and Gen Z farmers in northern Thailand

Generational differences were stark (Figure 2). Gen Z preferred short video (84.6%) and live streaming (71.2%) far more than millennials, who showed more balanced

preferences across formats. Text posts scored below 32% for both groups.

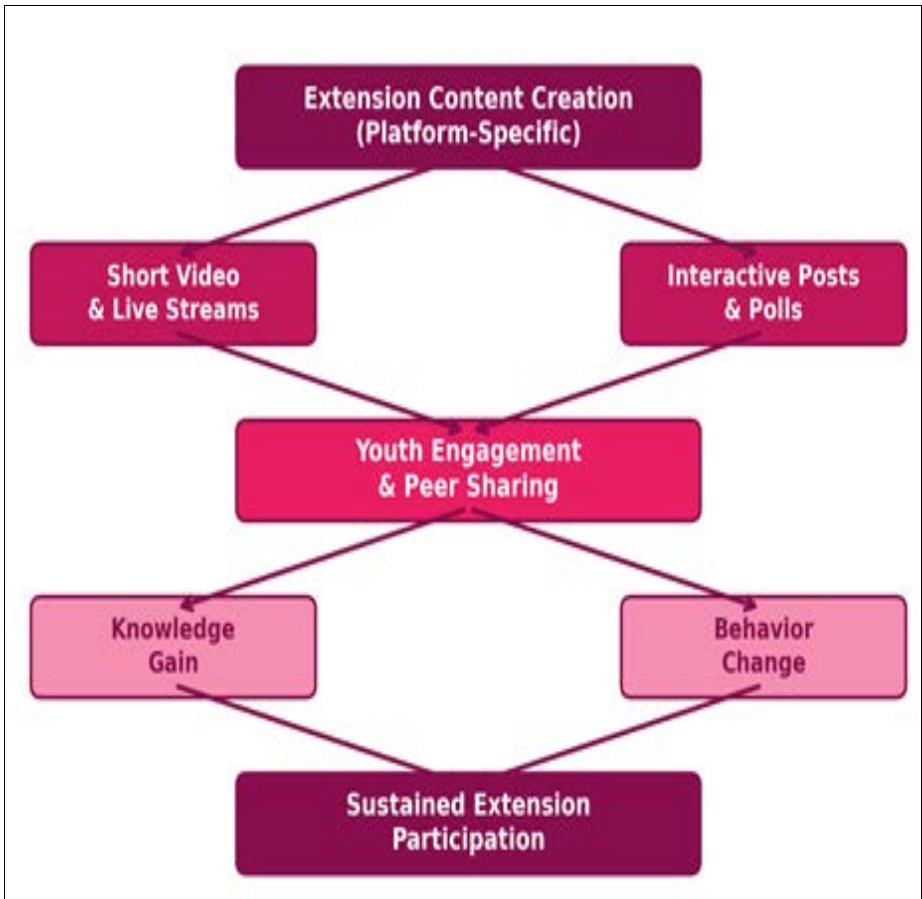


Fig 3: Proposed mechanism for social media-based agricultural extension engagement with young farming communities

The mechanism model (Figure 3) traces the pathway from platform-specific content creation through video and interactive formats to youth engagement, which branches into knowledge gain and behavior change, ultimately supporting sustained extension participation.

Discussion

The finding that no single platform excels across all dimensions has a clear practical implication: effective digital extension requires a multi-platform strategy. TikTok's dominance in engagement (78.9%) and youth preference (89.4%) makes it the primary attention-capture tool, but YouTube's superior information retention (68.7%) suggests it should handle deeper educational content. LINE's strength in behavior change (61.4%) likely reflects its private messaging function, which enables direct follow-up a finding consistent with research from India showing that personalized digital contact outperforms broadcast formats for behavior change^[7, 16].

The generational divide in content preferences is particularly important for extension planning. Gen Z's overwhelming preference for short video (84.6%) signals that the 45-second agricultural tip format already popular on TikTok should become a core extension delivery tool, not an afterthought. But the 2.7x adoption advantage of socially engaged farmers only materializes when digital engagement is combined with extension officer follow-up (OR = 1.77), suggesting that social media works best as a complement to, not replacement for, personal advisory contact^[5, 6].

Conclusion

Social media can function as an effective agricultural extension tool for young farmers when platform-specific content strategies are employed. TikTok captures attention, YouTube builds knowledge retention, and LINE facilitates behavior change through personal follow-up. A multi-platform approach combining short video content with interactive engagement and peer-sharing mechanisms produces the strongest results. Extension agencies should train officers in digital content creation, develop platform-specific content guidelines, and integrate social media analytics into extension monitoring systems.

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