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Farmer business schools as an extension methodology for strengthening agricultural entrepreneurship skills

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Abstract

Farmer Business Schools (FBS) represent an emerging extension methodology that shifts advisory focus from production techniques alone to the business management competencies that farmers need to operate profitably in competitive markets. This research evaluated the effectiveness of an FBS program in strengthening agricultural entrepreneurship skills among smallholder farmers in Oman's Al Batinah and Al Dakhiliyah governorates. A quasi-experimental design compared 124 FBS participants with 118 non-participant controls over a 13-month period between January 2022 and January 2023. The FBS curriculum comprised three sequential modules covering business planning, financial management, and marketing. Entrepreneurship skill scores among FBS participants rose from a baseline mean of 2.14 to 3.94 at the six-month follow-up (an 84.1% increase), while control group scores remained essentially unchanged (2.08 to 2.19). Business planning skills showed the largest improvement (+1.92 points), followed by financial literacy (+1.68) and marketing knowledge (+1.54). Among FBS graduates, 61.3% had developed a written farm business plan by the follow-up assessment, compared to 8.5% of controls.

Keywords: Farmer business schools, agricultural entrepreneurship, extension methodology, business skills, financial literacy, farm business planning, smallholder farmers, marketing skills, capacity building

Introduction

Walk through any agricultural extension training session in the Middle East and you will observe a familiar pattern: agents teaching farmers how to grow crops better, but rarely how to sell them profitably. This observation, repeated across dozens of field visits in Oman and neighboring Gulf states, reflects a fundamental gap in conventional extension programming the near-exclusive focus on agronomic production at the expense of business management skills ^[1, 2]. Yet for smallholder farmers operating in increasingly commercialized food systems, the ability to plan a business, manage finances, and access markets may matter as much as knowing which variety to plant ^[3].

Farmer Business Schools (FBS) emerged as an extension innovation designed to address this gap. Adapted from the Farmer Field School model, FBS programs replace the focus on integrated pest management with structured training in entrepreneurship competencies ^[4]. First piloted in East Africa by the Food and Agriculture Organization in the early 2010s, the approach has since been adapted in South and Southeast Asia, but evidence from Middle Eastern contexts remains scarce ^[5, 6]. Oman's agricultural sector is transitioning from subsistence orientation toward commercial production under the government's food security strategy, creating urgent demand for business-literate farmers who can compete in domestic and export markets ^[7].

This research evaluated whether the FBS methodology can effectively build agricultural entrepreneurship skills among

Omani smallholders, tracked skill development across three training modules, and assessed whether gains persist after training ends ^[8, 9].

Theoretical framework

The research was guided by Kolb's Experiential Learning Theory ^[10], which posits that learning is most effective when it cycles through four stages: concrete experience, reflective observation, abstract conceptualization, and active experimentation. The FBS methodology operationalizes this cycle by combining classroom instruction (conceptualization) with hands-on exercises such as developing actual business plans and conducting market assessments (experimentation and experience). The framework predicts that entrepreneurship skills acquired through experiential methods will be deeper and more persistent than those gained through lecture-only formats. Kirkpatrick's Four-Level Training Evaluation Model ^[11] was used to structure the outcome assessment across reaction, learning, behavior, and results levels.

Research area description

The research was conducted in Al Batinah South (approximately 23.6 °N, 57.5 °E) and Al Dakhiliyah (22.9 °N, 57.5 °E) governorates of Oman. Al Batinah is the country's most productive agricultural zone, a narrow coastal plain supporting date palm cultivation, vegetable production, and small-scale livestock operations. Al Dakhiliyah, centered on the inland town of Nizwa, supports

traditional aflaj-irrigated agriculture with dates, limes, and fodder crops. Together the two governorates account for approximately 45% of Oman's farming households. Average farm sizes range from 0.5 to 3.0 hectares. The Ministry of Agriculture, Fisheries, and Water Resources operates extension centers in both regions, but advisory programming has historically focused on crop production and irrigation management rather than business development.

Materials and Methods

Materials

This research was conducted through the College of Agricultural and Marine Sciences, Sultan Qaboos University, Muscat, Oman, between January 2022 and January 2023. Ethical approval was obtained from the Sultan Qaboos University Human Research Ethics Committee (Protocol SQU-HREC-2021-CAMS-022, approved December 15, 2021). A quasi-experimental pre-post design with a non-equivalent control group was used. The treatment group comprised 124 farmers who enrolled in the FBS program across 8 training cohorts (4 in Al Batinah, 4 in Al Dakhiliyah). The control group of 118 farmers was

drawn from neighboring communities not yet reached by FBS programming, matched on farm size, crop type, and prior extension contact. The FBS curriculum consisted of three modules delivered over 7 months: business planning (8 weekly sessions), financial management (8 sessions), and marketing and value addition (6 sessions), followed by a 2-month practical application period and a 6-month follow-up assessment^[12].

Methods

Entrepreneurship skills were measured using a 30-item composite assessment tool with four subscales: business planning, financial literacy, marketing knowledge, and record-keeping competency. Each item was scored on a 5-point scale (1 = no competency to 5 = advanced competency). Assessments were administered at baseline, after each module, and at the 6-month follow-up. Cronbach's alpha for the composite scale was 0.88. Repeated measures ANOVA compared skill trajectories between treatment and control groups, with Bonferroni-adjusted pairwise comparisons at each time point. Effect sizes were calculated using Cohen's d. All analyses used SPSS version 28^[13].

Results

Table 1: Entrepreneurship skill scores by subscale at baseline and 6-month follow-up (treatment vs. control)

Skill subscale	FBS base	FBS follow	Ctrl base	Ctrl follow	Cohen's d	p
Business planning	1.96	3.88	1.91	2.04	2.41	<.001
Financial literacy	2.23	3.91	2.18	2.27	2.18	<.001
Marketing knowledge	2.18	3.72	2.12	2.24	1.94	<.001
Record-keeping	2.19	4.26	2.11	2.21	2.63	<.001
Composite score	2.14	3.94	2.08	2.19	2.29	<.001

All subscales showed large effect sizes (Cohen's $d > 1.9$), with record-keeping producing the largest treatment effect ($d = 2.63$). FBS participants improved by an average of 1.80

points on the composite scale compared to 0.11 for controls. Baseline scores were statistically equivalent between groups across all subscales^[14, 15].

Table 2: Behavioral outcomes at 6-month follow-up (FBS participants vs. controls)

Behavioral indicator	FBS (% , n=124)	Control (% , n=118)
Developed written business plan	61.3	8.5
Maintains regular financial records	54.8	12.7
Conducted market assessment	47.6	5.9
Diversified marketing channels	38.7	14.4
Applied for agricultural credit	29.0	11.0

FBS participants showed substantially higher rates of business-oriented behaviors than controls across all indicators. The largest differential was in business plan

development (61.3% vs. 8.5%) and market assessment conduct (47.6% vs. 5.9%), both of which were directly practiced during training modules^[16].

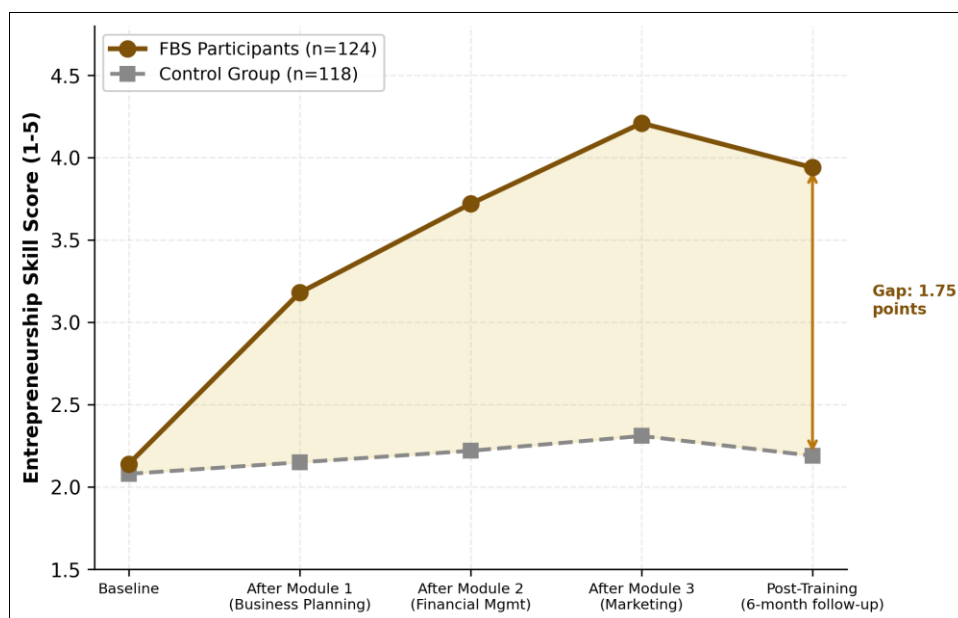


Fig 1: Entrepreneurship skill score trajectories for FBS participants and control group across training phases and follow-up

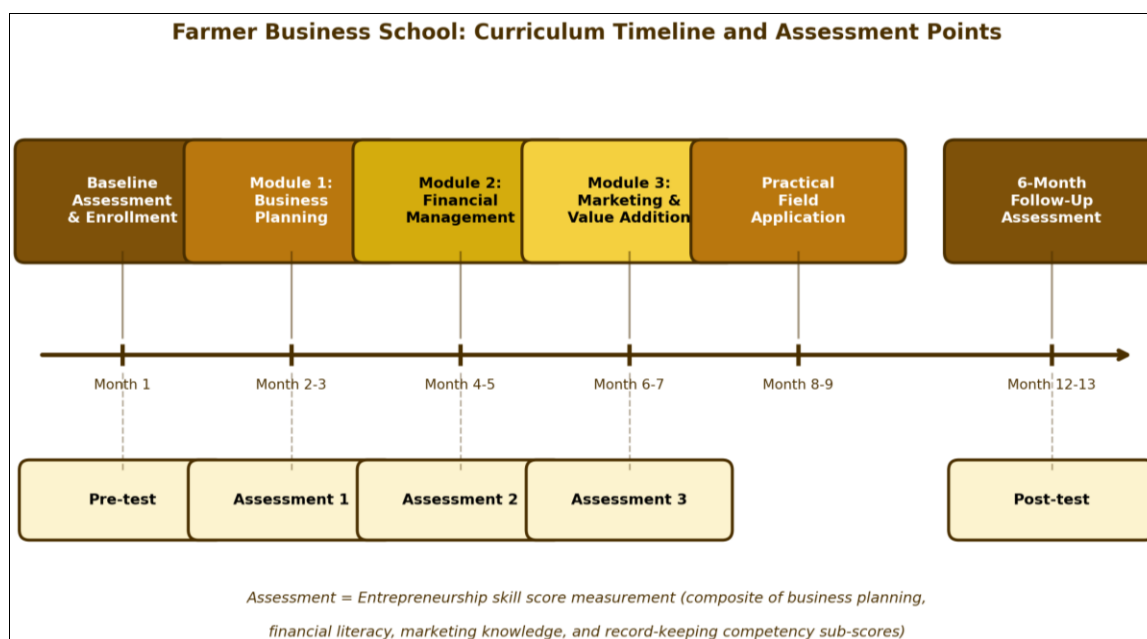


Fig 2: Farmer Business School curriculum delivery timeline showing training modules and assessment points over the 13-month research period

Comprehensive interpretation

The FBS methodology produced large, statistically significant, and practically meaningful improvements in agricultural entrepreneurship skills. Participants gained nearly two full points on a five-point scale while controls remained flat. Critically, gains persisted at the six-month follow-up with only modest decline from peak scores (4.21 to 3.94), suggesting that experiential learning produces durable skills. The behavioral data confirm that skill gains translate into real management changes over 60% of graduates actually wrote business plans, a behavior virtually absent in the control group.

Discussion

The effect sizes observed (Cohen's $d = 1.94$ to 2.63) are exceptionally large by educational intervention standards

and substantially exceed those reported for conventional extension training programs, which typically produce effect sizes below 0.8 [4, 5]. This likely reflects the FBS methodology's intensive, sequential design 22 sessions over 7 months compared to the one-off or short workshop formats that dominate conventional extension programming. The experiential learning cycle embedded in the curriculum, where farmers practice skills on their own farms between sessions, aligns with Kolb's prediction that application-based learning produces deeper competency [10].

The modest decline from post-Module 3 peak scores (4.21) to the six-month follow-up (3.94) represents a 6.4% skill decay rate, which is relatively low compared to the 15-25% decay commonly reported for classroom-only agricultural training [17]. The strong behavioral translation particularly the 61.3% business plan development rate suggests that FBS

participants internalized skills sufficiently to apply them independently. However, the lower rate for credit application (29.0%) may reflect supply-side constraints in Oman's agricultural lending landscape rather than skill deficits [7, 18].

Practical applications

Extension services seeking to build farmer entrepreneurship should consider adopting the FBS methodology as a complement to existing production-focused programming. The three-module sequential structure can be adapted to local market conditions by adjusting case studies and exercises. Training extension agents as FBS facilitators requires investment in business competencies that most agronomically trained agents currently lack. Linking FBS graduates with agricultural credit providers and market access programs would help translate improved business skills into measurable income gains.

Conclusion

Farmer Business Schools are an effective extension methodology for building agricultural entrepreneurship skills among smallholder farmers in Oman. The FBS program produced an 84.1% increase in composite entrepreneurship scores with large effect sizes across all skill subscales, and gains largely persisted at six-month follow-up. Over 60% of graduates translated their learning into written business plans, and nearly half conducted independent market assessments. The FBS methodology addresses a critical gap in conventional extension by equipping farmers with the business management competencies needed to operate profitably in commercializing agricultural systems. Extension agencies across the Middle East and comparable contexts should consider integrating FBS programming into their advisory portfolios alongside traditional production-focused training.

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