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YOUNG PEOPLE AS AGENTS OF DIGITAL INNOVATION IN FAMILY-OWNED AGRICULTURAL SMALL BUSINESSES: IMPLICATIONS FOR ECONOMIC SUSTAINABILITY

Florina Atanase (Murar)
Bucharest University of Economic Studies, Bucharest, Romania
PhD Candidate
atanaseflorina21@stud.ase.ro

INTRODUCTION

Family-owned agricultural small businesses are vital to rural economies, but face restricted resources, limited market access, and long-term sustainability concerns (Tirdasari et al., 2019; Cheng et al., 2021). Digital innovation — social media marketing, e-commerce and basic digital management tools — offers a low-cost path to resilience (Paunović & Vučković, 2024; Zhang & Fan, 2022).
Young people, especially students in agricultural high schools, are emerging as key drivers of this transformation, bridging traditional farming practice with contemporary market demands (Johnston & Humphries, 2019; Sandhu et al., 2012).
Research objectives: identify forms of youth digital engagement; analyze low-cost tools adopted; evaluate perceived economic impact; examine the link between agricultural education and innovation capacity; and assess youth's role in business resilience.
Research hypotheses: H1. Youth digital involvement positively influences financial sustainability. H2. Low-cost digital tools enhance visibility and attract new customers. H3. Youth digital competencies are positively associated with innovation level. H4. Youth participation in digital innovation strengthens business resilience. H5. Agricultural education facilitates the transfer of digital competencies.
Method: quantitative, cross-sectional pilot design; structured self-administered questionnaire (13 Likert items + categorical items + 1 open item); purposive sample of N=9 adult students (18+) at a dually-funded technological agricultural high school, Ilfov County, Romania, all active in a family agribusiness.

RESULTS

Youth are moderately active in day-to-day digital tasks (M≈3.22) but strongly seen as conceptual innovators (M=4.33) (Table 1).
Digital tools mainly boost market visibility and new-customer acquisition rather than cut costs (Table 2).
Agricultural education is linked to greater confidence in proposing digital solutions (M=4.00) (Table 3).
Resilience and intergenerational-collaboration items scored highest overall (M=4.44–4.67) (Table 4).
Correlational analysis supports H1, H3 and H4, with the strongest associations found for H1 and H3; the H4 association is comparatively weaker and the least stable of the three.

DISCUSSION

These pilot results are broadly consistent with prior evidence linking digital social capital to family-SME performance (Tiwasing et al., 2022) and diversification to resilience (Jack et al., 2020), while extending this literature to a population and setting not previously examined jointly: young members of a dually-funded technological agricultural high school in rural Romania.
Youth appear to act as catalysts of digital innovation, complementing older generations' accumulated experience; the relationship between generational change and digital adoption is nonetheless more complex elsewhere (Bornhausen & Wulf, 2024; Zhang & Wei, 2025).
Given N=9, associations reported here are exploratory and hypothesis-generating rather than confirmatory.

CONCLUSIONS

Young people act as catalysts of digital innovation on family farms, strong on ideas, moderate on hands-on execution, while formal agricultural education builds the confidence to propose and implement digital initiatives.
Economic sustainability appears to rest on intergenerational transfer: combining youths' digital competencies with elders' accumulated agricultural and business experience, rather than either generation's contribution alone. Given N=9, this remains exploratory.
Limitations: small purposive sample (N=9), self-reported measures, cross-sectional design, and no separate ethics review at this pilot stage.
Future research: a larger multi-school sample, a longitudinal design, and objective business indicators — e.g., testing whether joint parent-child digital training strengthens this intergenerational transfer.

Abstract: Family-owned agricultural small businesses have a vital role in rural economies by providing employment, ensuring food security, and promoting community stability. However, these enterprises frequently face significant challenges, including limited resources, restricted market access, and concerns regarding long-term financial sustainability. In this context, innovation, specifically digital innovation, emerges as a pivotal mechanism for enhancing economic resilience within small-scale agricultural family enterprises. This study investigates the role of youth, particularly students enrolled in entrepreneurial education programs within an agricultural technological high school, as catalysts of digital innovation in family-owned agricultural micro and small enterprises. It also focuses on low-cost and accessible digital solutions, including social media marketing, online sales channels, and basic digital management tools, which are particularly suited for small agricultural businesses with limited financial resources. Employing a quantitative, cross-sectional pilot design, data were gathered through a structured, self-administered questionnaire from nine adult students (N=9, aged 18 and above) enrolled in entrepreneurial education classes at a dually-funded (Ministry of Education and Ministry of Agriculture and Rural Development) technological agricultural high school in a rural area of Ilfov County, Romania, who are actively involved in their family-owned agricultural businesses. The analysis explores the degree of youth engagement in digital innovation activities and examines the perceived impact of these innovations on financial sustainability, market visibility, cost-effectiveness, and overall business resilience. Given the small pilot sample, findings are preliminary and exploratory rather than confirmatory. Results suggest that young people may have an important influence in initiating and implementing digital innovations within their families' businesses, serving as a potential link between conventional agricultural practices and contemporary market requirements. Furthermore, this research points to a possible role of agricultural education in developing innovation capabilities that could promote sustainable business models in rural contexts. By focusing on the intersection of innovation, education, and economic sustainability, the study aims to provide preliminary insights and a validated instrument for a larger-scale investigation into the long-term viability of family-owned agricultural enterprises.

Key words: family businesses, digital innovation, youth, economic sustainability, agricultural education, rural development

PILOT STUDY RESULTS

This exploratory pilot study offers a preliminary understanding of how young people, especially students enrolled in agricultural high schools, may contribute to digital innovation within small, family-run agricultural enterprises. The results show that although direct involvement in routine digital operations is moderate, respondents' input at a conceptual level is rated highly. Young individuals are described as introducing fresh ideas, suggesting digital improvements, and offering strategic perspectives. This gap between hands-on participation and perceived creative potential is consistent with their possible role as catalysts of digital transformation on family farms.

Table 1. Descriptive Statistics of Youth Involvement (N=9)

Item / Variable	M	SD	Level
Active involvement in online promotion	3.11	1.05	Moderate
Proposing new digital ideas	3.22	0.97	Moderate
Use of social media (FB/Instagram)	3.22	1.56	Moderate
Online communication w/ clients	3.78	1.48	High
“Youth involvement is innovation”	4.33	1.00	Very High

Table 2. Perceived Impact on Economic Performance (N=9)

Economic Indicator	M	SD	Level
Increase in sales volume	3.22	1.39	Moderate
Attracting new customers	3.56	1.33	High
Reduction of promotion costs	2.67	1.32	Low-Mod.
Increase in market visibility	3.67	1.12	High
Contribution to econ. sustainability	3.56	1.33	High

Table 3. Influence of Education on Innovation (N=9)

Variable	M	SD
“Agricultural education helped me propose innovative solutions”	4.00	1.50

Table 4. Resilience and Long-Term Development (N=9)

Resilience Indicator	M	SD	Level
Intergenerational collaboration	4.67	0.71	Very High
Adaptability to economic changes	4.44	1.01	Very High
Chances of long-term development	4.67	1.00	Very High

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