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# Gender Roles Stir the Recipe: How Learning Orientation Fuels Innovativeness in Tanzania's Food-Processing Firms

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## ABSTRACT

**Purpose:** Food processing firms are of great benefit. Despite their importance in the economy, they have not grown enough to ensure survival and growth, which demand them to be innovative. Thus, this paper analyses the relationship between learning orientation (LO) and innovativeness in food processing firms taking into account the moderation effect of gender roles in Tanzania. Specifically, the relationship between LO and innovativeness was determined, and the moderation effect of gender roles on the LO-innovativeness relationship was tested.

**Methodology:** The study employed 224 owner-managers of food processing firms. A questionnaire with Likert scale type items was used to gather data. Analysis was done by Partial Least Squares Structural Equation Modelling (PLS-SEM).

**Findings:** The findings revealed that Commitment to Learn ($\beta = 0.247$, $p < 0.001$), Open Mindedness ($\beta = 0.275$, $p < 0.001$), Shared Vision ($\beta = 0.216$, $p < 0.001$), and Gender Roles ($\beta = 0.276$, $p < 0.001$) significantly enhanced innovativeness in food processing. The was no moderation effect of gender roles on the relationship between learning orientation and innovativeness.

**Unique Contribution to Theory, Policy and Practice:** The study supports the Organisational Learning Theory by demonstrating that a firm which focus on continuous learning and unlearning is in a better position of being innovative and being a market leader as learning orientation is a resource that is not easily imitative. Gender roles showed no moderating effect implying that when owners/managers have multiple gender roles that are pulling them away from the business, draws back their innovative capability. Thus, societies should advocate against all kinds of gender related drawbacks that unlevel the ground of innovation. Policy makers to formulate and implement a policy which would support food processing firms to learn from various external and internal stakeholders.

**Keywords:** *Learning Orientation, Innovativeness, Gender Roles, Food Processing Firms*

## 1.0 Introduction

Food processing firms have gained significant attention from policymakers and scholars from an economic perspective. Statistics indicate that food processing firms account for about 50% to 60% of the value addition in food crops (World Bank, 2020; Gurria, 2020), impacting many countries' socio-economic transformation, given that such processing interventions serve as innovation hubs, sources of employment, value creation and economic growth (Gurria, 2020; USAID, 2017). In the economy of Tanzania, food processing firms are approximately 39% of all the formal small and medium enterprises, contributing about 7.1% of the employment-base and around 8% to the country's GDP (UN, 2020; World Bank, 2020; NBS, 2020).

Food-processing enterprises contribute substantially to economic development; yet, many of them struggle to achieve sustainable growth. Recent estimates indicate that only 40 percent of such firms can meet their financial obligations, while the remaining 60 percent falter during infancy (World Bank, 2020; Kweka & Sooi, 2020). Customer acquisition and retention are equally problematic: merely one in five firms succeeds on this front (World Bank, 2020). The situation is worsened by hypercompetitive conditions marked by abbreviated product life cycles and intense rivalry (Kozminski, 2020) that threaten business survival in Tanzania's food-processing sector (Mwenda, Israel, & Mahuwi, 2023).

Scholars regard innovation as the principal lever for organisational resilience and growth in this volatile environment (Mahto, McDowell, Kudlats, & Dunne, 2018; Mwenda *et al*., 2023; Xiao, Mamun, Masukujjaman, & Yang, 2023). Firms, therefore, engage in an ongoing mission to spot and exploit emerging market opportunities (Wales, Beliaeva, Shirokova, Stettler, & Gupta, 2020). Against this backdrop, it becomes critical to clarify what innovativeness entails, which factors nurture it, and what forms of organisational learning are required to realise it (Karpacz & Wojcik-Karpacz, 2024).

Meeting the innovation requirements for the firm to remain in the market requires continuous learning of the dynamic market and constantly changing behaviour of the stakeholders (Awan & Hashmi, 2014). In other words, for a hypercompetitive and dynamic market like that of food processing, a strong learning character is of paramount importance (Kiyobo & Isaga, 2019). Besides, learning orientation is well-thought-out as a strategic resource which is hardly imitated and has an influence on the firm's innovativeness (Hussain, Shah, & Khan, 2016).

Prior research has examined the impact of learning orientation on firm innovativeness. For example, Hermawati (2020) indicates that owner-managers of food processing micro and small enterprises (MSEs) who lack adequate learning orientation struggle to compete in highly competitive and dynamic markets, often resulting in the closure of their business ventures. Additionally, market dynamics can be mitigated if owner-managers possess the necessary learning capabilities and business practices that allow them to seize market opportunities and address challenges effectively (Ogunyemi, 2020). A suitable learning orientation among firm members not

only aids in the collection and dissemination of market information but also involves a continuous evaluation of the quality of information available to the business and the underlying principles that drive all business processes and practices (Herath & Karunaratne, 2017).

Although food-processing enterprises play a pivotal role in many economies, scholarly insight into why, how, and under what conditions they innovate remains scant. The bulk of innovation research still centres on technology-intensive sectors, leaving low-tech, traditional industries largely unexamined (Mahto *et al*., 2018; Ali, Mad-Lazim, & Iteng, 2020; TM & Joseph, 2021). Innovation, understood here as the adoption of novel ideas or behaviours to improve firm performance (Daft, 1978; Damanpour & Evan, 1984; Nasution, Mavondo, Matanda, & Ndubisi, 2011), is resource-hungry and risky. Consequently, small firms, often short on capital and subject to high failure rates, are frequently deemed poor candidates for innovation studies (Alsos, Ljunggren, & Hytti, 2013; TM & Joseph, 2021). Yet, given both the benefits and the challenges facing food-processing businesses, it is essential to identify what sparks innovation within them (Mrosso, Genda, and Tutuba, 2024). This paper fills in that gap.

Drawing on extensive literature from management, entrepreneurship, and marketing, the paper develops a conceptual model of innovativeness in food processing firms. Learning orientation (LO) is defined as the organisational value system that underpins learning processes and comprises three elements: Commitment to learning—the firm's dedication to continuous knowledge acquisition; Open-mindedness—a willingness to question entrenched assumptions that guide decisions; and Shared vision—a collective understanding of long-term goals that aligns learning priorities (Sinkula, Baker, & Noordewier, 1997). Additionally, five areas of firm abilities are examined as indicators of innovativeness in food processing firms: Strategies—to identify, generate, assess, and pursue ideas for innovation; Organisation—Organising innovation activities; Process—management by allocating resources for innovative activities; Linkage—formation with external parties to integrate knowledge, inputs and managing innovation activities; and Learning—from experience generated from monitoring the results of innovation activities, exploiting and managing other knowledge that has been generated as part of firm innovation activities (OECD, 2018; Tidd & Bessant, 2018). Building on prior research into entrepreneurship and small business, such as Hambrick and Mason (1984) and Makwana, Mahida, & Dodia (2023), these studies posit that the owner-manager's gender roles—decision-making power, access to and ownership of productive resources, and domestic responsibility burdens—moderate the effect of LO on firm innovativeness. To test these propositions, the researcher surveyed food-processing firms located in Arusha City and Arusha District in north-eastern Tanzania.

This paper offers several noteworthy contributions to the innovation and food-processing literature. First, it applies partial least squares structural equation modelling (PLS-SEM) to specify learning orientation (LO) as a higher-order construct comprising three interrelated lower-order dimensions (Hair, Hult, Ringle, & Sarstedt, 2022; Sarstedt, Hair, Cheah, Becker, and Ringle, 2019), thereby underscoring the construct's multidimensional nature. Second, the PLS-SEM

framework makes it possible to explore how gender roles interact with LO to shape firm innovativeness, a question that has become increasingly salient with the rise of women-owned enterprises (Gupta, Turban, Wasti, & Sikdar, 2009). Third, the analysis extends our understanding of innovation drivers in low technology, traditional-sector firms, an area that remains under-represented in existing research. Finally, because the influence of LO in low-tech contexts has received little empirical scrutiny (Mahto *et al*., 2018), the study provides a foundational model for future investigations.

## 2.0 Literature Review

Innovation is recognized as a key success factor for firms in an increasingly competitive economy globally (Zastempowski & Cyfert, 2021). Innovation refers to the introduction and implementation of novel ideas or practices within an organisation (OECD, 2018). Realising such novelty hinges on three interconnected conditions: employees must remain vigilant and receptive to fresh knowledge (Alerasoul, Afeltra, Hakala, Minelli, & Strozzi, 2022); they must actively search for creative ways to solve problems (Baker, Mukherjee, & Perin, 2022); and the organisation must foster a climate that rewards experimentation and the exploitation of new initiatives (Baker & Sinkula, 2002). A strong learning orientation (LO) amplifies this process because staff continually scan their environment for up-to-date information and insights, an ability that becomes indispensable in industries, marked by rapid product turnover and fierce competition (Zastempowski & Cyfert, 2021). Accordingly, employees embedded in learning-oriented firms are more likely to embrace new ideas than those in organisations where such a culture is weak.

However, to stay competitive in turbulent markets, firms must cultivate the capacity to learn and adapt (Hussain *et al*., 2016). Learning orientation (LO), which is conceived of as the collective values that prioritise knowledge acquisition and capability development, has consequently become a central construct in marketing and management research (Keskin, 2006; Sinkula *et al*., 1997; Wang, 2008). At the group or unit level, scholars usually operationalise LO through three attitudinal dimensions: commitment to learning, open-mindedness, and a shared strategic vision among members. Because these elements enhance both the absorption of new knowledge and the processing of complex competitive signals, empirical evidence consistently links stronger LO with superior organisational outcomes (Imran & Taqadus, 2020; Hadi, 2023).

Empirical research consistently supports the link between LO and innovativeness. Hurley and Hult (1998) reported a significant positive relationship in a large U.S. government R&D agency; Wang (2008) found the same pattern among UK firms; and Keskin (2006) observed comparable effects in Turkish SMEs employing 50-250 people. Together, these studies underscore the pivotal role of learning orientation in stimulating organisational innovation. Despite the fact that learning orientation ignites innovation in firms, it has not been well studied in the low-tech firms such as food processing firms. It is not conclusive yet if learning orientation really influences innovativeness because some recent studies found non-significant relationships (Cho, 2020;

Gareja, 2023). Others found negative relationships (Rostini, Souisa, Masmarulan, & Yasin, 2021), and others found positive relationships (Mahto *et al*., 2018; Imran & Taqadus, 2020; Hadi, 2023). In understanding this relationship, gender roles have been tested for their moderation effect.

The intensity of organisational learning is fuelled by a common purpose that combines commitment with open-mindedness. According to Sinkula *et al*. (1997), open-mindedness refers to employees' willingness to scrutinise routine activities and entertain new ideas, while a shared vision denotes the organisation-wide focus on continuous learning that aligns members around the same goal. According to Alerasoul *et al*. (2022), without a common vision, learning among organizational members is less significant. This shows itself in the way that many innovative ideas in business practice are never put into action because there is no shared vision. Because of the organization's varied interests, great ideas seldom become reality. Consequently, an organizational focus on the application of new information is necessary for a positive learning climate. According to Calantone, Cavusgil, & Zhao, 2002), a defined learning direction is likely to develop organizational strength or even a core competency. This suggests that LO is an organizational-level phenomenon that promotes collective/organizational learning (Keskin, 2006).

Furthermore, Lam, Lee, Keng-Boon Ooi, & Lin (2011) view learning orientation (LO) as an organisation-wide process of creating and applying knowledge. By systematically capturing information on customer preferences, market trends, competitive moves, and technological advances; firms use that knowledge to design superior products. Learning-oriented companies acquire insights from their own successes and failures and from external sources such as markets, technologies, competitors, and broader socio-economic conditions (Baker & Sinkula, 1999b; Calantone *et al*., 2002; Hakala, 2011; Schulze, Townsend & Talay, 2022).

Importantly, LO extends beyond a narrow market focus. Baker and Sinkula (1999a) argue that such firms encourage members to "think outside the box," constantly challenging entrenched organisational routines. This willingness to unlearn obsolete assumptions about markets, customers, and rivals (Nystrom & Starbuck, 1984; Baker & Sinkula, 2002) helps companies avoid competence traps and make more proactive decisions (Baker, Mukherjee, & Perin, 2022). Against this backdrop, this paper explores whether the gender roles of the owner-manager moderate the link between LO and innovativeness in food-processing firms.

Many theories have been propounded to elaborate the factors influencing firms in responding to the volatile market needs. The Organisational Learning Theory by Cangelo & Dill (1965) is one of them. This theory is among the most prominent theories in business management which is associated with hypercompetitive environments (Hussain *et al*., 2016). The theory stipulates that organisations which are proactive to learning the internal and external environments are likely to perform better than those which are not. Learning includes obtaining information, interpreting it, sharing it and using it for decision making in the future. Therefore, with strong learning, firms can

find innovative ways of operating in the market and invent strategies and practices that are suitable for the hypercompetitive market (Kaunda, Thuo, & Kwendo, 2023).

The Organisational Learning Theory relates to the topic at hand in the sense that when food processing firms learn quickly from the internal and external environments, they are in a position to perform better specifically through becoming innovative. Basically, in this text with learning from internal and external environments, it means learning orientation whereas performance is the innovativeness of the food processing firms. Particularly, the theory supports the position of the study that a relationship exists between learning orientation and innovativeness of food processing firms. With this understanding, the variables used in this paper and relationships between them are defined and pointed out below from literature.

According to Sinkula *et al*. (1997), learning orientation comprises commitment to learning, open-mindedness, and sharing of vision to learn among the personnel in the organisation, resulting to organisation learning. Also, Calantone *et al*. (2002) explain that the elements of learning orientation are commitment to learning, open-mindedness, shared vision and intra-organisational knowledge sharing. Hence, firms need to be committed to learn the quick changing environments and competition; be open to receive new knowledge, ideas and experience on food processing; and have a shared vision on the direction, operation, focus and belief of the organisation. So, learning orientation makes organisations proactive in decision making and competitive in business environment. For the interest of this text, three elements are used, which are commitment to learning, open-mindedness and shared vision which have got the attention of other scholars too such as Hussain *et al*. (2016), Rostini *et al*. (2021); Nnko, Ismail, & John, (2024), and Baker *et al*. (2022) to study food processing innovativeness in Tanzania.

Gender roles in entrepreneurship studies centre on the operational effect as a way of understanding the differences between male and female entrepreneurs and their orientation to various entrepreneurial behaviours (Makudza, Makwara, Masaire, Dangaiso, & Sibanda, 2024). As stipulated by Mahto *et al*. (2018), a firm owner-manager has a great influence on the firm's behaviour, especially small firms such as the majority of food processing firms. Hambrick and Mason (1984) earlier stated that the gender roles of the owner or manager of a firm impact the firm's performance, particularly firm innovativeness. This has caught attention of scholars, given that literature on entrepreneurship is supplied with widespread opinions that female entrepreneurs face prejudgments and barriers because of their gender roles (Heise *et al*., 2019) and that male counterparts have a better entrepreneurial mind-set (Makwana *et al*., 2023) which makes them more likely to innovate. This runs parallel with significant increasing research on female entrepreneurship and women owned businesses (Mahto *et al*., 2018).

Prior research frequently reports gender-based contrasts between male- and female-owned enterprises (Santos, Marques, & Ratten, 2019; Nouri, Imanipour, & Ahmadikafeshani, 2019; Kawarazuka & Prain, 2019). However, Hemmert, Cho, & Lee, (2024) did a systematic literature

review study and noted that earlier studies often characterised female owner-managers as more cautious, less aggressive, and less self-confident, with weaker leadership and problem-solving skills than their male peers. More recent evidence, however, is mixed and increasingly stresses on similarities rather than differences. In line with this evolving view, Makwana et al. (2023) suggest that gender roles shape how individuals recognise and exploit opportunities in their environment. Given these divergent findings, this paper investigates whether and how gender roles moderate the relationship between learning orientation (LO) and innovativeness in food-processing firms.

Food processing firms differ pointedly in innovativeness and innovation generation (Schenkel, McDowell, & Brazeal, 2024). Some firms do better in innovation generation and utilization for improvement in performance and survival in the competitive market, while other firms fail. At the same time the main player in influencing innovation in the firm is the owner-manager. As stated by various scholars, the founder of a firm creates lasting impact on their organisations (Osei-Bonsu, Liu, & Yawson, 2024) thereby inspiring its behaviour even after their exit from the firm. Generally, firms' owners have significant control of and influence on the firm's strategy and conduct (Hambrick and Mason, 1984). In addition, firms such as ones for food processing are usually built around the owner/managers perspectives, which amplifies the extent of influence these individuals have on the organisation. Thus, according to Hambrick & Mason (1984), the gender roles of the owner-manager should have a significant impact on the firms' innovativeness. In this paper, the main argument builds on the fact that firm owners/managers have a direct influence on innovativeness in food processing firms. Specifically, firm owners/managers influence team learning orientation and hence influence innovativeness. It was hypothesised that owners'/managers' gender roles moderate this relationship, as demonstrated in Figure 1.

## 3.0 Methodology

The research on which this paper is based was an explanatory cross-sectional survey, which enabled the researcher to determine relationships between learning orientation and innovativeness with the moderation effect of gender roles. The post-positivism research philosophy was applied to the research. Thus, the post-positivism philosophical pattern in this text allowed for testing of the organisational learning theory in the context of analysing food processing firms in Arusha Region, Tanzania.

The study was carried out in Arusha District Council and Arusha City Council in Arusha Region. The region was purposively selected due to its distinctive cultural settings, particularly Meru and Maasai cultures to facilitate the study of gender roles' moderation effect. The selected districts were found to be relevant, accessible, and ensured sufficient data availability because they are home to numerous food processing firms (URT, 2022).

The study population was food processing firms. There is high competition in this sector of food processing from micro to large firms. There is a notable shift on customer preferences and habits, given change in lifestyles and presence of substitute food products in the market which necessitate

a constant learning behaviour in response to changing market demand that leads to food processing entrepreneurs being innovative. Moreover, the food processing sub-sector is considered to be of priority in Tanzania to achieve the national development goals (URT, 2021). The study used a sample of 224 food processing firms. The sample size was calculated using the hyper-geometric formula that is for calculation of statistically realistic sample sizes from small sampling frames (Jung, 2014). The sampling frame was 284 registered food processing firms.

All survey items were adapted from established scales reported in the literature. Learning-orientation (LO) measures were taken from Mahto et al. (2018), who drew on the original scale by Sinkula et al. (1997) and its later validation by Baker and Sinkula (1999). The resulting instrument comprises 11 items that capture three LO dimensions—commitment to learning, open-mindedness, and shared vision—and has been widely used by subsequent scholars (e.g., Sinkula et al., 2017; Herath & Karunaratne, 2017; Rostini et al., 2021).

Firm innovativeness was assessed with items adapted from Gamal, Salah, & Elrayyes (2011); these statements evaluate the extent to which a firm engages in the core facets of innovativeness identified by Calik, Calisir, & Cetingue (2017), Tidd & Bessant (2018) and Tidd, Bessant, & Pavitt (2005). All variables were measured on a five-point Likert scale with items to which the responses ranged were Strongly disagree (1 point), Disagree (2 points), Undecided (3 points), Agree (4 points), or 5 Strongly agree (5 points).

For the PLS-SEM analysis, model quality was assessed at three levels—measurement model, structural model, and the structural regression equation—following the guidelines by Hair et al. (2020). The conceptual framework (Figure 1) specifies three latent LO constructs (commitment to learning, shared vision, and open-mindedness) and two control variables (firm age and firm size), with innovativeness as the dependent variable and gender roles as the moderator variable.

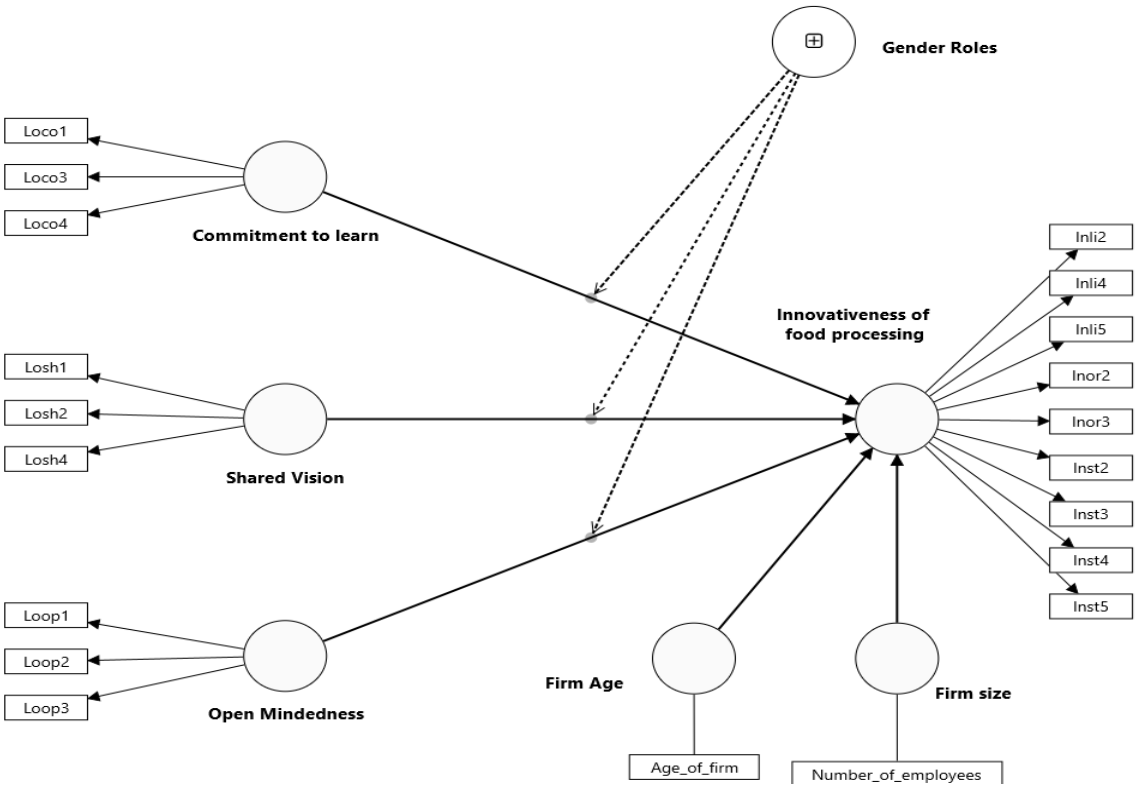


**Figure 1: Conceptual framework guiding PLS-SEM**

### 3.1 Results of the Measurement and Structural Models

#### 3.1.1 Assessment of the Measurement Model: Reliability and Validity

Prior to estimating the structural paths, the how well the observed indicators captured their intended latent constructs was evaluated. Following Sarstedt, Ringle, & Hair (2017), outer loadings, Cronbach's alpha, composite reliability (CR), average variance extracted (AVE), and discriminant validity were assessed. As summarised in Table 1, all indicators show outer loadings above the acceptable threshold of 0.70, satisfying Hair et al.'s (2019) criterion. The Cronbach's Alpha, rho_A, and Composite Reliability values for all constructs exceed 0.80, indicating strong internal consistency. Additionally, the Average Variance Extracted (AVE) values range between 0.776 and 0.908, which are well above the recommended cut-off of 0.50, confirming that more than half of the variance in the dependent variable (innovativeness) was explained by the construct itself, in line with the guidance of Fornell and Larcker (1981). These results confirm that the measurement model demonstrates adequate reliability and convergent validity for further structural model analysis.

**Table 1: The measurement model assessment of indicators**

| Indicators | Outer Loadings | Cronbach's Alpha | Rho_A | Composite Reliability | AVE |
|---|---|---|---|---|---|
| Commitment to Learn | | 0.949 | 0.950 | 0.967 | 0.908 |
| Loco1 | 0.956 | | | | |
| Loco3 | 0.954 | | | | |
| Loco4 | 0.949 | | | | |
| Open Mindedness | | 0.896 | 0.899 | 0.935 | 0.828 |
| Loop1 | 0.916 | | | | |
| Loop2 | 0.899 | | | | |
| Loop3 | 0.915 | | | | |
| Shared Vision | | 0.941 | 0.945 | 0.962 | 0.895 |
| Losh1 | 0.939 | | | | |
| Losh2 | 0.952 | | | | |
| Losh4 | 0.947 | | | | |
| Innovativeness of Food Processing | | 0.964 | 0.965 | 0.969 | 0.776 |
| Inli2 | 0.867 | | | | |
| Inli4 | 0.858 | | | | |
| Inli5 | 0.869 | | | | |
| Inor2 | 0.866 | | | | |
| Inor3 | 0.870 | | | | |
| Inst2 | 0.908 | | | | |
| Inst3 | 0.889 | | | | |
| Inst4 | 0.885 | | | | |
| Inst5 | 0.915 | | | | |
| Gender Roles | | 0.981 | **0.982** | **0.983** | **0.804** |
| Gsst1 | 0.866 | | | | |
| Gsst10 | 0.941 | | | | |
| Gsst11 | 0.909 | | | | |
| Gsst13 | 0.922 | | | | |
| Gsst14 | 0.830 | | | | |
| Gsst15 | 0.880 | | | | |
| Gsst16 | 0.881 | | | | |
| Gsst17 | 0.873 | | | | |
| Gsst18 | 0.900 | | | | |
| Gsst19 | 0.901 | | | | |
| Gsst2 | 0.922 | | | | |
| Gsst4 | 0.912 | | | | |
| Gsst7 | 0.891 | | | | |

### 3.1.2 Measurement model assessment of discriminant validity

Table 2 shows the discriminant validity assessment under the Fornell–Larcker criterion. The bold diagonal values represent the AVE of each construct, while the off-diagonal elements represent correlations between constructs. In all cases, the diagonal AVE values are greater than the corresponding inter-construct correlations, which indicates that each construct shares more variance with its own indicators than with other constructs. This confirms that discriminant validity is satisfied, ensuring that the constructs in the model are empirically distinct (Sarstedt, Ringle, & Hair, 2017).

**Table 2: Discriminant validity under Fornell-Larcker criterion**

| Variables | Commitment to Learn | Firm Age | Firm size | Gender Roles | Innovativeness of Food Processing | Open Mindedness | Shared Vision |
|---|---|---|---|---|---|---|---|
| Commitment to Learn | 0.908 | | | | | | |
| Firm Age | -0.024 | 1.000 | | | | | |
| Firm size | 0.030 | -0.137 | 1.000 | | | | |
| Gender Roles | 0.545 | 0.070 | -0.032 | 0.804 | | | |
| Innovativeness of Food Processing | 0.589 | -0.038 | 0.074 | 0.688 | 0.776 | | |
| Open Mindedness | 0.438 | 0.019 | -0.058 | 0.615 | 0.626 | 0.828 | |
| Shared Vision | 0.306 | 0.012 | 0.044 | 0.492 | 0.530 | 0.351 | 0.895 |

***Bolded numbers are the AVE of the diagonal indicator***

Table 3 provides the results of the discriminant validity assessment using the Heterotrait-Monotrait ratio (HTMT). All HTMT values are below the conservative threshold of 0.90 (Hair et al., 2019), ranging from 0.012 to 0.790. This indicates that the constructs are not excessively correlated and confirms discriminant validity across all constructs. The results reinforce the adequacy of the measurement model, suggesting that the constructs used in this study are distinct and suitable for testing the hypothesized structural relationships.

**Table 3: Discriminant validity under HTMT**

| Relationship | Heterotrait - monotrait ratio (HTMT) |
|---|---|
| Firm Age <-> Commitment to learn | 0.025 |
| Firm size <-> Commitment to learn | 0.031 |
| Firm size <-> Firm Age | 0.137 |
| Gender Roles <-> Commitment to learn | 0.564 |
| Gender Roles <-> Firm Age | 0.071 |
| Gender Roles <-> Firm size | 0.037 |
| Innovativeness of_ food processing <-> Commitment to learn | 0.615 |
| Innovativeness of_ food processing <-> Firm Age | 0.041 |
| Innovativeness of_ food processing <-> Firm size | 0.075 |
| Innovativeness of_ food processing <-> Gender Roles | 0.706 |
| Open Mindedness <-> Commitment to learn | 0.474 |
| Open Mindedness <-> Firm Age | 0.021 |
| Open Mindedness <-> Firm size | 0.063 |
| Open Mindedness <-> Gender Roles | 0.656 |
| Open Mindedness <-> Innovativeness of_ food processing | 0.672 |
| Shared Vision <-> Commitment to learn | 0.323 |
| Shared Vision <-> Firm Age | 0.012 |
| Shared Vision <-> Firm size | 0.045 |
| Shared Vision <-> Gender Roles | 0.511 |
| Shared Vision <-> Innovativeness of_ food processing | 0.555 |
| Shared Vision <-> Open Mindedness | 0.381 |

## 4.0 Findings and Discussion

### 4.1 Evaluation of the Structural Model

An additional step in assessing the PLS-SEM results involves analysing total effects, which capture the overall influence of each antecedent on the focal outcome, the project success. Table 4 presents the results of the structural model estimation, showing the hypothesized relationships between learning orientation constructs, gender roles, firm characteristics, and food processing innovativeness in Arusha city and district council. The results demonstrate that Commitment to Learn ($\beta = 0.247$, $p < 0.001$), Open Mindedness ($\beta = 0.275$, $p < 0.001$), and Shared Vision ($\beta = 0.216$, $p < 0.001$) have significant and positive effects on innovativeness, indicating that firms with higher levels of learning orientation dimensions are more likely to enhance innovative practices in

food processing. Similarly, Gender Roles ($\beta = 0.276$, $p < 0.001$) significantly predicts innovativeness, suggesting that gender-related dynamics within firms influence how innovation is perceived and adopted.

Firm-level controls show mixed results: Firm Age ($\beta = -0.052$, $p = 0.176$) has a non-significant and negative effect, implying that older firms may not necessarily drive more innovation, while Firm Size ($\beta = 0.089$, $p = 0.036$) exerts a positive and significant effect, meaning larger firms possess greater resources and capabilities to innovate. Interaction terms between Gender Roles and the learning orientation constructs (Commitment to Learn, Open Mindedness, and Shared Vision) are not statistically significant ($p > 0.05$), suggesting that gender roles do not moderate these specific relationships in the context of food processing innovativeness.

Overall, the findings emphasize that learning orientation dimensions are critical drivers of innovation in the food processing sector, with gender roles also playing a direct role, while firm size provides an additional enabling factor. These results align with previous PLS-SEM studies (Batra, 2023; Hair et al., 2020), which underscore the importance of organizational learning and contextual factors in shaping innovative capacity.

**Table 4: Structural model estimation for hypothesis testing**

| Relationship | Original sample (O) | Sample mean (M) | Standard deviation (STDEV) | T statistics (\|O/STDEV\|) | P values |
|---|---|---|---|---|---|
| Commitment to learn -> Innovativeness of_ food processing | 0.247 | 0.249 | 0.053 | 4.699 | 0.000*** |
| Firm Age -> Innovativeness of_ food processing | -0.052 | -0.051 | 0.038 | 1.355 | 0.176 |
| Firm size -> Innovativeness of_ food processing | 0.089 | 0.087 | 0.043 | 2.097 | 0.036* |
| Gender Roles -> Innovativeness of_ food processing | 0.276 | 0.277 | 0.062 | 4.430 | 0.000*** |
| Gender Roles x Commitment to learn -> Innovativeness of_ food processing | 0.061 | 0.059 | 0.048 | 1.273 | 0.203 |
| Gender Roles x Open Mindedness -> Innovativeness of_ food processing | 0.005 | 0.006 | 0.042 | 0.122 | 0.903 |
| Gender Roles x Shared Vision -> Innovativeness of_ food processing | 0.035 | 0.036 | 0.043 | 0.823 | 0.410 |
| Open Mindedness -> Innovativeness of_ food processing | 0.275 | 0.274 | 0.057 | 4.795 | 0.000*** |
| Shared Vision -> Innovativeness of_ food processing | 0.216 | 0.219 | 0.047 | 4.631 | 0.000*** |

*Indicates the significance of indicator at 0.05 level of significance

**Indicates the significance of indicator at 0.01level of significance

***Indicates the significance of indicator at 0.001 level of significance

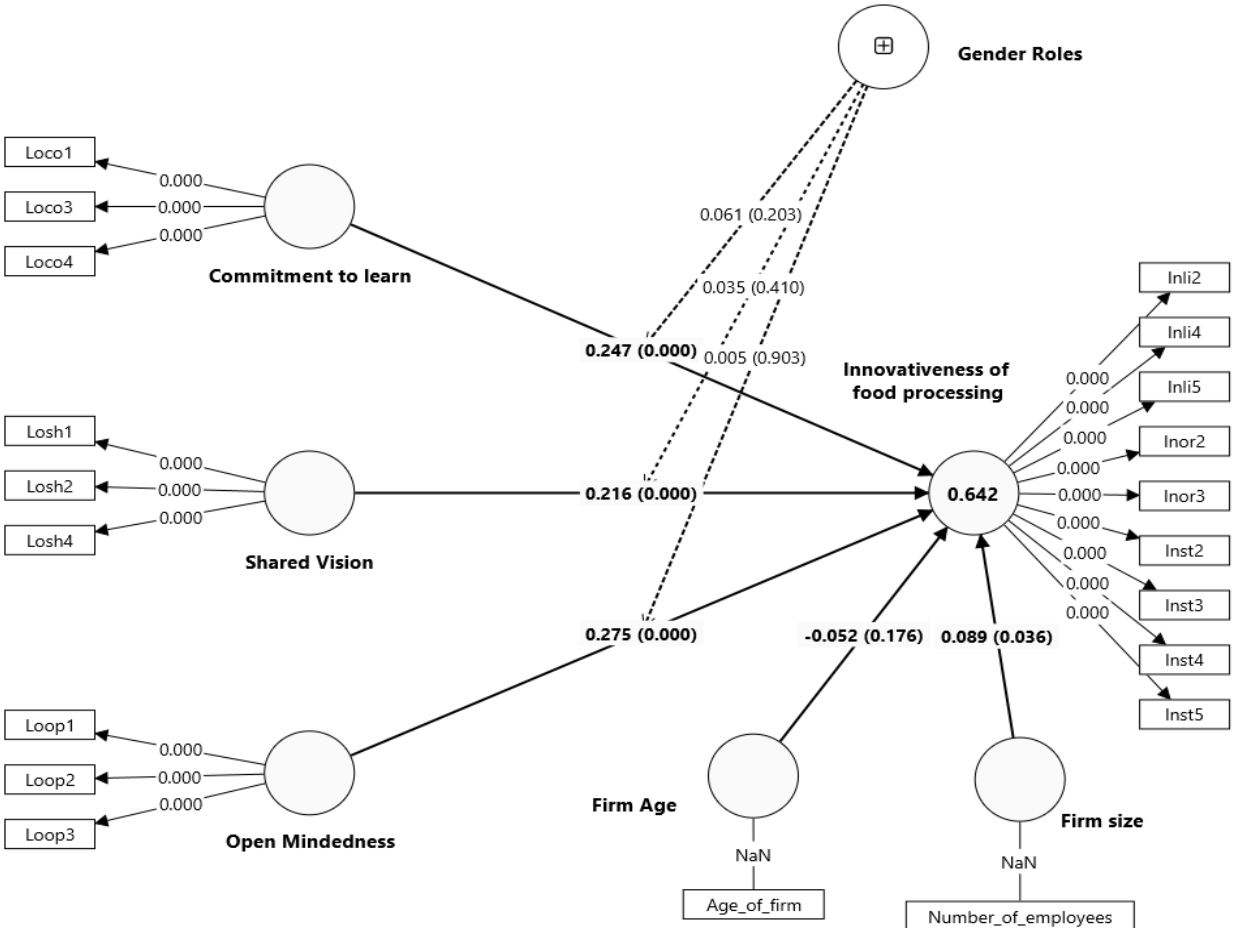


Figure 2 Bootstrap model with estimation

### 4.2 PLS Path Prediction and Importance Map Analysis

#### 4.2.1 Assessment of predicted values and fit

In Section 4.2.1, the assessment of predicted values and fit for the model is based on the predictive accuracy indicators provided in Table 5. The $Q^2$predict values for the various indicators (ranging from 0.272 to 0.407) indicate a moderate level of predictive relevance for the model (Batra, 2023). The PLS-SEM approach generally yields lower RMSE (Root Mean Square Error) and MAE (Mean Absolute Error) values compared to the LM (Linear Model) approach, suggesting that PLS-SEM provided a better fit for the data. Specifically, the RMSE values for PLS-SEM ranged from 0.861 to 0.954, while those for LM ranged from 0.890 to 1.014 (Sarstedt et al., 2017). Similarly, the MAE values for PLS-SEM ranged from 0.645 to 0.707, while those for LM ranged from 0.670 to 0.737. The overall $Q^2$predict for the innovativeness of food processing was 0.555, indicating substantial predictive accuracy, with an RMSE of 0.671 and an MAE of 0.524, further demonstrating that the model effectively predicted the outcome variables.

**Table 5: Predicted values measurement of fit in Exogenous variable**

| Indicator | Q²predict | PLS-SEM_RMSE | PLS-SEM_MAE | LM_RMSE | LM_MAE |
|---|---|---|---|---|---|
| INli2 | 0.309 | 0.936 | 0.675 | 0.945 | 0.688 |
| INli4 | 0.353 | 0.901 | 0.657 | 0.932 | 0.681 |
| INli5 | 0.293 | 0.946 | 0.684 | 0.993 | 0.715 |
| INor2 | 0.333 | 0.954 | 0.707 | 1.003 | 0.737 |
| INor3 | 0.394 | 0.861 | 0.645 | 0.890 | 0.670 |
| INst2 | 0.407 | 0.929 | 0.674 | 0.952 | 0.685 |
| INst3 | 0.383 | 0.940 | 0.687 | 1.014 | 0.712 |
| INst4 | 0.272 | 0.935 | 0.657 | 0.939 | 0.696 |
| INst5 | 0.383 | 0.903 | 0.653 | 0.932 | 0.694 |
| | Q²predict | | RMSE | MAE | |
| **Innovativeness of food processing** | 0.555 | | 0.671 | 0.524 | |

### 4.2.2 Importance of map analysis

To complement the structural-model results, an importance–performance map analysis (IPMA) was generated that treats project success as the endogenous target construct. The map plots each antecedent's total effect (importance) against its average latent-variable score (performance), thereby revealing which capabilities deserve managerial attention. Among the predictors of innovativeness in Tanzanian food-processing firms, gender roles (0.276) and open-mindedness (0.275) emerged as the two most powerful levers for boosting innovative outcomes showing that firms that are receptive to new ideas and that integrate gender-related considerations in organizational practices are better positioned to foster innovativeness. Shared vision (0.214) and Commitment to learn (0.245) also play substantial roles, highlighting that continuous learning and a collective sense of direction enhance innovative capacity. In contrast Firm size (0.087) showed a negligible effect, and firm age (-0.053) had a small negative effect, suggesting that older firms might be slightly less innovative. The construct performance offered a different perspective, showing how well each construct performed. Open-mindedness had the highest performance score (54.98), followed by gender roles (49.997) and commitment to learn (46.621). This indicates that these constructs were not only important but also performed well in the context of promoting innovativeness. In contrast, firm age (33.879) and firm size (41.494) showed lower performance scores, aligning with their minimal or negative impact suggesting that while firm-level characteristics matter, they are less critical compared to learning orientation and gender dynamics

These results imply that strengthening open-mindedness and addressing gender inclusivity within organizational culture should be strategic priorities for improving innovativeness in food processing firms. The relatively lower performance of shared vision and commitment to learn suggests potential areas for managerial interventions, such as enhancing team cohesion and continuous skill-building. Consistent with Hair et al. (2020) and Sarstedt et al. (2017), IPMA extends the interpretation of PLS-SEM results by not only showing which constructs are significant but also guiding practical recommendations by combining importance and performance dimensions.

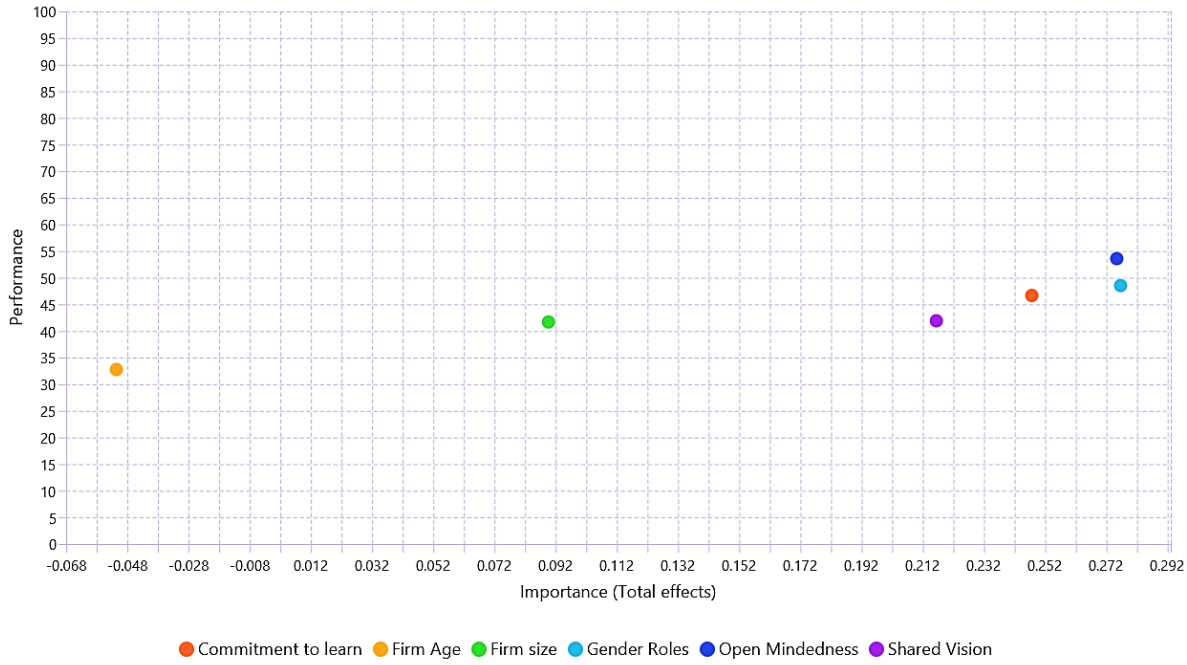


**Figure 3: Importance performance map of indicators**

### 4.3 Discussion

This paper investigates how learning orientation (LO) shapes innovativeness in Tanzanian food-processing firms and examines whether the gender roles of the owner-manager moderate that relationship. The statistical analysis results indicated the LO dimensions which are commitment to learning, open-mindedness, and shared vision had significant strong positive effects on firm's innovative performance. These findings are consistent with prior evidence from Mahto et al. (2018), Hadi (2023), and Imran & Taqadus (2020), but diverge from the results by Gajere (2023) and Cho (2020). Overall, the data highlight three innovation-related capabilities supported by LO: linkage, organisational routines, and strategic direction.

First, LO strongly enhances a firm's linkage capability, the ability of a firm to build and manage external relationships that supply complementary knowledge, resources, and partners. This result echoes Akram, Lei, Haider, & Hussain (2020), who contend that accessing external knowledge is

now indispensable because firms can no longer depend solely on their internal resource base. Resource constraints frequently hamper the acquisition of in-house production factors, thereby limiting innovation and competitiveness (Wynarczyk, 2013). LO acts as an organisation-level catalyst for collective learning (Alerasoul, Afeltra, Hakala, Minelli, & Strozzi 2022), enabling firms to mine information on customer needs, market shifts, competitor moves, and technological advances (Lam et al., 2011). In such resource-limited contexts, companies must create mechanisms that secure external inputs and combine them with existing assets to sustain innovation (Simeone, Secundo, & Schiuma 2017).

Secondly, LO had a significant influence on organisation which implies that LO facilitated organising innovation activities within the firm. This result is in line with findings by Zastempowski & Cyfert (2021) which indicate that the very initial steps an owner-manager takes before concentrating on the issue of innovation development is to define the way the process of innovation is organized. It is at this stage where the owner-manager of the firm adjusts the strategies and structures internally, as well as making important choices such as centralization or decentralisation of the innovation activities. Great ideas remain unimplemented due to lack of flexibility in the organization. Consequently, organisations that exhibit a strong learning orientation devote particular attention to putting newly acquired knowledge into practice. Calantone et al. (2002) reinforce this point, noting that a well-defined learning agenda can become a source of organisational strength—and even evolve into a distinctive core competence.

Finally, LO significantly influenced strategy, which implies that LO promotes formulation of strategies to identify, generate, assess, and pursues ideas for innovation. Zastempowski & Cyfert (2021) and Reutzel, Collins, & Belsito (2018) agree with these findings; they argue that these abilities shape the fundamental process of innovation. At this juncture, the owner-manager evaluates potential avenues for innovation and decides where to channel organisational resources. A pronounced learning orientation strengthens the firm's capacity to detect, develop, appraise, and exploit innovative ideas by fostering a culture that critically reviews established routines and remains receptive to new approaches (Alerasoul et al., 2022).

By exploring the learning orientation–innovation nexus within food-processing enterprises, this study broadens entrepreneurship scholarship beyond its traditional high-technology focus. A systematic review of prior work indicates that most investigations of LO's impact on innovation have concentrated on large firms in advanced, technology-intensive industries (Alsos et al., 2013; TM & Joseph, 2021). As a result, evidence from low-technology food-processing settings has been scarce, an empirical gap that the present research fills. Therefore, this study's findings extend our understanding of food processing firms' innovativeness and provide food processing firms owners/managers with another tool for improving innovativeness.

Gender roles had direct influence on innovativeness which concurs with the findings of a study by Zastempowski & Cyfert (2021) and Mrosso et al., (2024). However, the findings of this study

contradict with the findings reported by Expósito, Sanchis-Llopis, & Sanchis-Llopis (2023). The results of this study are also in line with a view by Hemmert et al. (2024) that men and women have similar impact on innovativeness; thus, they are equally committed to learning and are open-minded towards innovation. These results are the opposite of the findings obtained by Mahto et al. (2018) who found that the relationship between LO and innovation was stronger when the firm owner had lesser gender related commitments. Also, as reported in this paper, firm size and age had no significant influence on innovativeness, given the nature of innovation that needs investment and experience. Therefore, the findings confirmed that LO is important for innovativeness of food processing to attain competitive advantage as also supported by Baker et al. (2022).

## 5. Conclusions and Recommendations

On the basis of the finding that the relationship between LO and food processing innovativeness was positive and highly significant, it is concluded that a firm which has a focus on continuous learning and unlearning is in a better position of being innovative and being a market leader as learning orientation is a resource that is not easily imitative. Gender roles did not moderate any of the dimensions of learning orientation implying that when owners/managers have multiple gender roles that are pulling them away from the business, draws back their innovative capability. Thus in the case of this study both male and female firm owners/managers are equally capable to ensure that the firm is committed to learn the quick changing environment and completion and ready to receive new knowledge, ideas and experience on food processing given that the gendered dynamics are minimised.

Based on the above conclusions, it is recommended to firms to be proactive in gathering, evaluating and using information from both external and internal environments so as to be innovative and gain competitive advantages. It is also recommended to the Ministry of Industry and Trade to support food processing firms, especially with knowledge about technology, market, networks and collaboration so that they can improve their levels of innovation through interactive learning. Further, it is recommended to policy makers, particularly local government authorities, to formulate and implement a policy that would support food processing firms to learn from various external and internal stakeholders. Finally, it is recommended to societies to advocate against all kinds of gender roles related drawbacks that unlevel the ground of innovation as gender roles are among the key components of culture in the society. It is hoped that future investigations in the food processing and learning orientation will be inspired by this study.

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