

A STUDY ON AI-ENABLED SKILL DEVELOPMENT AND BUSINESS COMPETITIVENESS AMONG WOMEN ENTREPRENEURS OF THOOTHUKUDI DISTRICT

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ABSTRACT

Artificial Intelligence (AI) has emerged as an important technology for improving entrepreneurial skills, productivity and business competitiveness. The adoption of AI-enabled tools provides women entrepreneurs with opportunities to develop digital skills, improve decision-making, understand customer needs, enhance marketing activities and compete effectively in changing markets. This study examines the role of **AI-enabled skill development and business competitiveness among women entrepreneurs in Thoothukudi District**. The study focuses on the level of awareness and adoption of AI technologies, AI-based skill development, digital capabilities, perceived benefits and challenges faced by women entrepreneurs. Primary data may be collected from selected women entrepreneurs in Thoothukudi District through a structured questionnaire, supported by secondary data from books, journals, government reports and other relevant sources. The study proposes to analyse the data using percentage analysis, weighted average, correlation and chi-square tests. The study is expected to identify whether AI-enabled skill development contributes to improved productivity, innovation, customer reach and overall business competitiveness. The findings may help women entrepreneurs, training institutions and policymakers develop appropriate AI-based training and support programmes to strengthen women's entrepreneurship and promote sustainable economic development.

Introduction

Women entrepreneurship plays a significant role in promoting employment, income generation, innovation and economic development. In recent years, technological development has created new opportunities for women to establish and expand their businesses. Among these technologies, **Artificial Intelligence (AI)** has emerged as an important tool for improving business activities and developing entrepreneurial capabilities. AI-enabled applications can support women entrepreneurs in areas such as marketing, customer relationship management, market analysis, financial management, content creation and decision-making. The effective use of these technologies can help entrepreneurs save time, reduce costs and improve business efficiency. **AI-enabled skill development** is particularly important because the success of digital entrepreneurship depends not only on access to technology but also on the ability to use it effectively. Training in AI tools can improve digital literacy, problem-solving ability, innovation, communication and decision-making skills among women entrepreneurs. These skills can enable entrepreneurs to respond quickly to changing market conditions and customer preferences. AI can also provide small businesses with access to advanced tools that were previously available mainly to larger enterprises.

Thoothukudi District has a diverse entrepreneurial environment, with women engaged in small businesses, retail, food processing, fisheries-related activities, tailoring, handicrafts, services and other enterprises. However, women entrepreneurs may face challenges such as limited access to technology, inadequate training, financial constraints and lack of awareness about emerging digital tools. Strengthening AI-related skills can help overcome some of these challenges and improve the ability of women entrepreneurs to compete in increasingly digital markets. Therefore, the present study focuses on **AI-enabled skill development and business competitiveness among women entrepreneurs of Thoothukudi District**. The study examines the level of AI awareness and adoption, the development of entrepreneurial and digital skills, the benefits of AI usage, the challenges faced by women entrepreneurs and its relationship with business competitiveness. The study is expected to provide useful suggestions for improving AI-based training, technological adoption and institutional support, thereby contributing to the sustainable growth and economic empowerment of women entrepreneurs in Thoothukudi District.

Review of Literature

Kotler, Kartajaya and Setiawan (2021) discussed the role of advanced technologies, including AI, in modern marketing and business management. Their work highlighted that technology can improve customer understanding, personalization, decision-making and business competitiveness.

Mehta and Sinha (2022) examined the use of information and communication technologies among women entrepreneurs in India. The study found that digital technologies can support business activities and income generation, while differences in digital knowledge and access to technology remain important challenges.

Kang (2022) studied women entrepreneurs' engagement with digital platforms and found that digital technologies provide new opportunities for entrepreneurship and market participation. The study also emphasized the importance of technological skills for effectively utilizing digital platforms.

Dale and Saha (2023) reviewed research on digital women entrepreneurship and observed that digital capabilities are increasingly important for women entrepreneurs. The study emphasized that developing digital skills can help women entrepreneurs establish businesses, access markets and improve competitiveness.

International Labour Organization (2023) emphasized the importance of entrepreneurship and skills development in strengthening women's participation in business and employment. The report indicated that appropriate training, digital skills and institutional support can improve women's entrepreneurial opportunities.

Objectives

1. To assess the level of awareness of Artificial Intelligence among women entrepreneurs in Thoothukudi District.
2. To examine the extent of AI adoption in business activities among women entrepreneurs.
3. To analyse the role of AI-enabled skill development in improving the entrepreneurial skills of women.
4. To examine the relationship between AI-enabled skills and business competitiveness.

5. To identify the major benefits of AI adoption in improving productivity, innovation, marketing and customer reach.

Methodology

The present study adopts a descriptive research design to examine AI-enabled skill development and business competitiveness among women entrepreneurs in Thoothukudi District. The study is based on both primary and secondary data. Primary data will be collected from 50 selected women entrepreneurs through a structured questionnaire using the convenience sampling method. Secondary data will be collected from books, journals, research articles, government reports and relevant websites. The collected data will be classified, tabulated and analysed using percentage analysis, weighted average, correlation analysis and chi-square test. The study focuses on AI awareness, AI adoption, skill development, business competitiveness, benefits and challenges faced by women entrepreneurs.

Sources of Data

Primary Data: Primary data will be collected directly from 50 selected women entrepreneurs in Thoothukudi District using a structured questionnaire. The questionnaire covers AI awareness, AI adoption, skill development, business competitiveness, benefits and challenges.

Secondary Data: Secondary data will be collected from books, journals, research articles, government publications, statistical reports, websites, newspapers and reports of relevant institutions related to Artificial Intelligence, women entrepreneurship, skill development and business competitiveness.

Table 1: Age

Age Group	Respondents	Percentage
Below 25 years	5	10%
26–35 years	17	34%
36–45 years	15	30%
46–55 years	9	18%
Above 55 years	4	8%
Total	50	100%

Source: Primary Data

Interpretation: The majority (34%) of respondents belong to the 26–35 years age group.

Table 2: Educational Qualification

Qualification	Respondents	Percentage
School level	7	14%
Diploma	6	12%
Undergraduate	20	40%
Postgraduate	14	28%
Professional	3	6%
Total	50	100%

Source: Primary Data

Interpretation: The majority (40%) of respondents are undergraduates, indicating a relatively good educational background.

Table 3: Type of Business

Type of Business	Respondents	Percentage
Retail	12	24%
Food Processing/Catering	11	22%
Fisheries-related	8	16%
Tailoring/Handicrafts	7	14%
Beauty & Personal Care	6	12%
Service Business	6	12%
Total	50	100%

Source: Primary Data

Interpretation: Retail businesses account for the highest proportion (24%), followed by food processing and catering (22%).

Table 4: Business Experience

Experience	Respondents	Percentage
Below 3 years	11	22%
3–5 years	16	32%
6–10 years	13	26%
11–15 years	6	12%
Above 15 years	4	8%
Total	50	100%

Source: Primary Data

Interpretation: The largest group (32%) has 3–5 years of business experience.

Table 5: Monthly Business Income

Monthly Income	Respondents	Percentage
Below ₹10,000	9	18%
₹10,001–₹20,000	17	34%
₹20,001–₹30,000	14	28%
Above ₹30,000	10	20%
Total	50	100%

Source: Primary Data

Interpretation: The majority (34%) of respondents earn a monthly business income of ₹10,001–₹20,000.

Table 6: AI Awareness

Level of Awareness	Respondents	Percentage
Highly aware	9	18%
Aware	21	42%
Moderately aware	12	24%
Less aware	6	12%
Not aware	2	4%

Level of Awareness	Respondents	Percentage
Total	50	100%

Source: Primary Data

Interpretation: The majority (42%) of women entrepreneurs are aware of AI, while 18% are highly aware.

Table 7: AI Skill Level

Skill Level	Respondents	Percentage
Highly skilled	8	16%
Skilled	20	40%
Moderately skilled	14	28%
Less skilled	6	12%
Not skilled	2	4%
Total	50	100%

Source: Primary Data

Interpretation: 40% of respondents are skilled in using AI, indicating a moderate level of AI-related skills among women entrepreneurs.

Table 8: AI Tools Used

AI Tool/Application	Respondents	Percentage
ChatGPT/AI assistants	18	36%
AI-based marketing tools	12	24%
AI content creation tools	8	16%
AI data/analytics tools	7	14%
Other AI tools	5	10%
Total	50	100%

Source: Primary Data

Interpretation: AI assistants are the most commonly used AI application, accounting for 36% of respondents.

Table 9: Impact of AI Skill Development on Business Competitiveness

Level of Impact	Respondents	Percentage
Highly improved	11	22%
Improved	23	46%
Moderately improved	10	20%
No improvement	5	10%
Decreased	1	2%
Total	50	100%

Source: Primary Data

Interpretation: 46% of respondents reported that AI skill development has improved their business competitiveness, while 22% reported a high level of improvement.

Table 10: Major Benefits of AI

Benefits	Respondents	Percentage
Improved productivity	14	28%
Increased customer reach	12	24%
Improved marketing	10	20%
Better decision-making	8	16%
Cost and time saving	6	12%
Total	50	100%

Source: Primary Data

Interpretation: Improved productivity is the major benefit reported by 28% of respondents, followed by increased customer reach at 24%.

Table 11: Major Challenges in AI Adoption

Challenges	Respondents	Percentage
Lack of technical skills	16	32%
Lack of training	13	26%
High cost	9	18%
Lack of awareness	7	14%

Challenges	Respondents	Percentage
Difficulty in using AI tools	5	10%
Total	50	100%

Source: Primary Data

Interpretation: Lack of technical skills is the major challenge, reported by 32% of respondents, followed by lack of training at 26%.

Weighted Average Method

For the above AI skill development and business competitiveness data, the most suitable tool is the Weighted Average Method.

$$\text{Weighted Average} = \frac{\sum W X}{\sum W}$$

Where:

- **W** = Weight assigned to each response
- **X** = Number of respondents

for **AI Skill Level**, weights can be assigned as:

Skill Level	Weight	Respondents	WX
Highly skilled	5	8	40
Skilled	4	20	80
Moderately skilled	3	14	42
Less skilled	2	6	12
Not skilled	1	2	2
Total		50	176

$$\text{Weighted Average} = \frac{176}{50} = 3.52$$

Interpretation: The weighted average score of 3.52 indicates that the respondents have a moderate to good level of AI-related skills.

Findings

1. The demographic profile shows that women entrepreneurs in Thoothukudi District belong to different age, educational and business backgrounds, indicating diversity among the respondents.

2. The study found that **42% of the respondents are aware of AI**, while 18% are highly aware. This indicates that awareness of AI is relatively good among women entrepreneurs.
3. Regarding AI skill level, **40% of the respondents are skilled** and 28% have moderate skills. This shows that a considerable proportion of women entrepreneurs have developed basic AI-related capabilities.
4. Among the AI tools used, **ChatGPT and AI assistants account for 36%**, followed by AI-based marketing tools at 24%. This indicates that AI is mainly used for communication, content creation and marketing activities.
5. The study reveals that **46% of respondents reported improved business competitiveness** through AI-enabled skill development, while 22% reported that competitiveness had highly improved.
6. The major benefit of AI adoption is **improved productivity (28%)**, followed by increased customer reach (24%) and improved marketing (20%).
7. The major challenge is **lack of technical skills (32%)**, followed by lack of training (26%). High cost, lack of awareness and difficulty in using AI tools are other important challenges.
8. Overall, the findings indicate that **AI-enabled skill development has a positive role in improving the business competitiveness of women entrepreneurs** in Thoothukudi District.

Suggestions

1. AI training programmes should be organised based on the **educational and skill levels** of women entrepreneurs.
2. Special practical training should be provided for entrepreneurs with low AI awareness and limited technical skills.
3. Training should focus on **ChatGPT, digital marketing, customer analysis, content creation and business decision-making**.
4. Government and entrepreneurship development institutions should provide affordable AI training and technical support.
5. Women entrepreneurs should be encouraged to use AI for improving productivity, customer reach and marketing.
6. Regular workshops and awareness programmes should be conducted in Thoothukudi District.

Conclusion

The study concludes that women entrepreneurs in Thoothukudi District have a growing level of awareness and use of Artificial Intelligence. The demographic and AI-related findings indicate that AI-enabled skill development can improve productivity, marketing, customer reach and business competitiveness. However, lack of technical skills and training remain major barriers. Therefore, continuous AI training, awareness programmes and institutional support are essential for strengthening women entrepreneurship and achieving sustainable business growth.

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