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# The Effect of Digital Technological Innovations on Entrepreneurship and Economic Growth of Female Heads of Households in Ilam City

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Keywords: digital technology, entrepreneurship, economic growth, female heads of the household.

**Article Type:** Research Article

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#### **Abstract**

**Background & Purpose:** The current research aims to provide a model for improving entrepreneurial business based on digital technological innovations for economic growth and empowerment of female heads of households in Ilam city Methodology: This research is applied in terms of purpose and survey in terms of data collection. The statistical population included 309 female heads of entrepreneur households in Ilam city. The external and content validity of the questionnaire was confirmed by specialists, and two criteria, Cronbach's alpha coefficient and composite reliability coefficient, were used to determine the reliability of the questionnaire. Cronbach's alpha coefficients of all variables in this study were higher than the minimum value of 0.7. The collected data were analyzed in the form of descriptive and inferential statistics using SPSS24 software. In the inferential statistics section, among the correlation methods, structural equation modeling (SEM) method with partial least squares approach was used for hypothesis testing and model fit using SmartPLS 2.0 software for this research. **Results:** The results of testing the research hypotheses using significant coefficients showed that all the research hypotheses are confirmed. The first hypothesis examines the impact of entrepreneurship on economic growth and this impact has been confirmed. The second hypothesis also examines the effect of using digital technology innovations on entrepreneurship and this issue has also been confirmed. In the third hypothesis, it was stated that the use of digital technological innovations with the mediating role of entrepreneurship has an effect on economic growth. Conclusion: The findings of the research showed that product and service innovations that result from the use of digital technology, regardless of whether they provide new features of the product or service, tend to be fundamental; Therefore, it provides a new path for women heads of household to increase their product and service innovation by using digital technological innovations for new customers.

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## Introduction

In today's era, there have been tremendous changes in the theories of development. One of these changes is attention to the category of human agency, something that has somehow caused the emergence and strengthening of theories such as empowerment in various fields, especially in the field of women. Based on this, empowering women includes increasing participation, self-awareness, and trustworthiness and expanding women's freedom of choice by themselves. (Sojasi Qeidari et al., 2017). If we imagine all the women of society as half of it, then empowering women actually means that they overcome their shame; their actions and words should indicate self-confidence and confidence; to be able to evaluate correctly and truly understand themselves; be aware of their inner talents and limitations; have the strength to face difficulties and try to solve them; have a detailed understanding of the desired goals and the ability to make them practical; have the ability to achieve their goals and be able to achieve the desired goals by increasing their ability. (Hosseini, 2020). On the other hand, "economic growth" is one of the important goals in every economy; However, achieving high and sustainable economic growth requires an answer to the question of what factors provide the economic growth rate. Various studies on countries' economic growth show that the economic growth rate does not give accurate results only through conventional factors such as capital and labor. Therefore, it is necessary to include "human capital" as a main variable in growth models. (Qorbani et al., 2020). Various studies worldwide have shown that entrepreneurship is an important factor in achieving economic growth (Erken et al., 2018; Urbano and Aparicio, 2016; Acs et al., 2012). By using innovation, creating and increasing competition and creativity, entrepreneurship

increases economic growth. (Akinwale et al., 2020). The study by Venkers and Turik (1999) showed that entrepreneurs play at least 13 different roles in the economy, among which innovation, identification and starting a new activity are assumed to be the most important roles (Mahmoud et al., 2019). According to the researchers, as in the past, the basis of economic growth was attributed to input factors, i.e., land, labor and capital. Today, the effect of entrepreneurship and innovation on economic growth is similarly noticed. Meanwhile, the development of technologies has played an irreplaceable role in the development of entrepreneurship (Hamdan, 2019). In the last decade, we have seen the emergence of a diverse set of technologies, operating systems and digital infrastructures that have changed the organization's direction (Elert and Henrekson, 2020). In addition, organizations from the private and public sectors and almost all industries have had no choice but to adopt advanced technology and use its applications (Jaafari Sadeghi et al., 2020). Discovering, integrating and exploiting new digital technologies has become one of the biggest challenges for businesses and society in the current environment, and no sector or organization is immune to its effects. Therefore, the term digital transformation is used today to indicate the transformation of businesses due to the effective consequences of digital technologies (Matt, 2019). Digital transformation is not limited to businesses, especially innovative businesses, digital start-ups, or high-tech mega-organizations. Instead, it is a process that involves different companies and is used in the most diverse industries as well as by their shareholders (Warner and Wager, 2019). Entrepreneurs can use new digital technologies at every stage, including the idea generation process, idea selection, resource collection, production and services, marketing, customer satisfaction, etc. (Jaafari Sadeghi et al., 2020).

Women's entrepreneurship is one of the components with a suitable capacity for development. Many researchers believe that entrepreneurial activities by women have a prominent role in the health of the nation's economy (Sojasi Qeidari et al., 2017). According to the announcement of the General Director of Cooperation, Labor and Social Welfare of Ilam Province, as of May 2020, 6,100 women heads of households in Ilam Province have registered in the unemployment insurance system (IRNA News, 2020). Out of this number, 1583 people make up the population of female heads of households in Ilam city (Donyaye Eghtesad newspaper, 2021), which is a significant number. Since this vulnerable group faces problems such as lack of access to job opportunities equal to men, lower levels of literacy and lower wages, etc., attention to the economic livelihood and employment of these women in Ilam city is considered one of the important issues. Therefore, the investigation of the categories of economic improvement and entrepreneurship of female heads of households in Ilam city, as well as the investigation of effective variables, including digital technological innovations, were considered in this research. This research seeks to answer the following questions:

Does the use of digital technology innovations have a direct, positive and significant effect on the entrepreneurship of female heads of households in Ilam city?

Does the use of digital technology innovations have a direct, positive, and significant effect on the economic growth of female heads of households in Ilam city?

Does entrepreneurship have a direct, positive, and meaningful effect on the economic growth of female heads of households in Ilam city?

Finally, the main question is, can the use of digital technological innovations in entrepreneurship affect the economic growth of female heads of households in Ilam city? While examining the background and stating research hypotheses, this article presents a model for improving entrepreneurial business based on digital technological innovations for economic growth and empowering women heads of households.

#### Methodology

The current study is applied research in terms of its purpose. Also, the method of data collection is a descriptive survey of correlation type. The statistical population of the research included all female heads of households in Ilam city, numbering 1583 people; The

sample size based on Cochran's formula and Morgan's table equal to 309 people was selected by simple random sampling. In order to collect data and information for analysis, a researcher-made questionnaire with a five-point Likert scale from completely disagree to completely agree been used. Persian and Latin library sources, articles, required books, and the Internet were used to collect information in the field of theoretical foundations and research literature. The face and content validity of the questionnaire was confirmed by the university's experts and professors To ensure the reliability of the measuring scales, Cronbach's alpha value was calculated, and a value higher than 0.70 indicated the appropriate reliability of the questionnaire. The collected data were analyzed using descriptive and inferential statistics using SPSS 24 software. In the inferential statistics section, among the correlation methods, the structural equation modeling (SEM) method with the partial least squares approach was used for hypothesis testing and model fit using SmartPLS 2.0 software for this research.

**Results**Demographic data are presented in the table below.

Table 1. Demographic data

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Variable	Age				Education			
	Below	31-	41-	Above	Elementary	Diploma	Associate	Graduate
	31	40	50	51			and	degrees
							bachelor's	
							degrees	
Frequency	24	102	134	49	72	143	76	18
Percentage	8	33	43	16	23	47	24	6

PLS modeling takes place in two stages: first, the measurement model (external model) is examined through validity and reliability analyzes and confirmatory factor analysis. In the next step, the structural model (internal model) is checked by estimating the path between the variables (Barney, 1999). Then the overall model is fitted. Factor loadings of the variables can be seen in the following table.

**Table 2: factor loading coefficients** 

Question	Coefficient	Question	Coefficient	Question	Coefficient
Number		Number		Number	
Q1	0/804	Q10	0/823	Q19	0/755
Q2	0/750	Q11	0/838	Q20	0/718
Q3	0/801	Q12	0/830	Q21	0/793
Q4	0/872	Q13	0/825	Q22	0/666
Q5	0/841	Q14	0/861	Q23	0/798
Q6	0/864	Q15	0/848	Q24	0/710
Q7	0/856	Q16	0/879	Q25	0/798
Q8	0/799	Q17	0/856	Q26	0/689
<b>Q</b> 9	0/815	Q18	0/814		

Factor loadings equal to or greater than 0.4 indicate that the variance between the structure and its indicators is greater than the variance of the measurement error of that structure. As the results of the above table show, all factor loading coefficients of the questions are greater than 0.4; That is, the variance of the indicators with the corresponding structure was acceptable, indicating this criterion's appropriateness. The PLS software output related to factor load and path coefficient and 2R coefficients can be seen in the figure below.

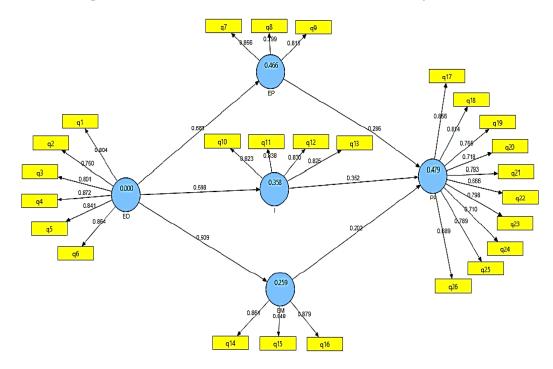


Figure 1: output of pls software related to factor load and path coefficient and R2 coefficients

The internal model expresses the relationship between the variables of the research. R2 criteria, Q2 criteria (Table 3), and t-significance numbers (Table 4) are used to fit the internal model. The results of the internal model fit are shown in the following tables.

Table 3: Results of R2, Q2 and Redundancy values

Table 5. Results of K2, Q2 and Redundancy values							
Structures	Substructures	R2	Q2	Redundancy			
Entrepreneurship		0/378	0/235	0/285			
Digital technology innovations	Use of information technology	0/466	0/311	0/315			
	Electronic learning	0/357	0/240	0/245			
	Efficiency in using technology	0/259	0/188	0/192			
Economic growth		0/480	0/266	0/278			

The R2 criterion shows the effect of an exogenous variable on an endogenous variable, and three values of 0.19, 0.33, and 0.67 are considered criteria values for weak, medium, and strong values (Fenny, 2019). Q2 criterion determines the predictive power of the model. If the value of Q2 in an endogenous structure obtains three values of 0.02, 0.15 and 0.35, it indicates the weak, medium and strong predictive power of the structure or related exogenous structures, respectively (Fani, 2019). In this research, the structural equation method was used to analyze the data and test the research hypotheses. The hypotheses test was used according to the value of the coefficient and the significance of the t-value.

Table 4: The results of research hypotheses

Table 4. The results of research hypotheses						
Path	Path	T	Result			
	coefficient					
Entrepreneurship to economic growth	0/729	10/600	Confirmed			
Digital technological innovation to entrepreneurship	0/692	12/804	Confirmed			
Digital technological innovation to economic growth	0/352	4/977	Confirmed			

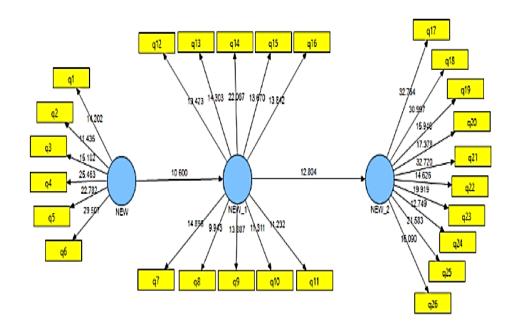


Figure 2: significant t-value coefficients of the research hypotheses

The result of fitting the research's general model (GOF) is shown in the following table. Considering the value of 0.513 (more than 0.360), the fit of the whole model is strong.

Table 5: The result of fitting the general model							
	Entrepreneurship	Using Electronic		Efficiency in	Economic		
		information	learning	using	growth		
		technology		technology			
Communality	0/677	0/678	0/687	0/744	0/580		
Result	$GOF = \sqrt{\overline{Communality} \times \overline{R^2}} = \sqrt{0.673 \times 0.390} = \sqrt{0.262} = \sqrt{0.462}$						

#### **Discussion and Conclusion**

The current research sought to design a new conceptual model that would be tested using real data and information and test hypotheses based on it. The purpose of this research was to investigate the direct and indirect effect of digital technological innovation on the economic growth of women heads of households through the mediation of entrepreneurship, to investigate the direct effect of using digital technological innovations on entrepreneurship, and also to investigate the direct relationship between digital technological innovation and economic growth. Based on the research literature, three hypotheses were formulated. Using the data obtained from the statistical sample of the research and partial least squares modeling, the hypotheses of the research findings are presented.

Testing the research hypotheses using significant coefficients showed that all the research hypotheses are confirmed. The first hypothesis examines the impact of entrepreneurship on economic growth and this impact has been confirmed. The second hypothesis also examines the effect of using digital technological innovations on entrepreneurship, and this issue has also been confirmed. The findings are consistent with the views of Mo et al., 2017; Mehrabi et al., 2019; Kolmenen and Stockman, 2014; Zhang et al., 2016; Hwang and Lee, 2017; Cao et al., 2009; Wei et al., 2014; Dai et al., 2017; Which shows that entrepreneurship is affected by digital technological innovations and affects economic growth.

The third hypothesis stated that using digital technological innovations with the mediating role of entrepreneurship affects economic growth. The research findings showed that product and service innovations that result from the use of digital technology, regardless of whether they provide new features of the product or service, tend to be fundamental. Therefore, it provides a new path for women heads of household to increase their product and service innovation by using digital technological innovations for new customers. This research supported the positive effects of digital technology and argued that these technologies should lead to innovation through fundamentally new products and services in order to meet the needs of existing customers and markets. The findings of Mehrabi

(2018), Gruber et al. (2010), Kozlankova et al. (2014), Zivdar and Sanaipour (2022) strengthen this argument.

According to the findings of the research and the economic status of women heads of households and the importance and necessity of improving the level of well-being and income of families, especially in low-income and poor areas, and the need to encourage them to create and develop small and sustainable businesses, entrepreneurship among women is an important matter. Meanwhile, women heads of households have always played a significant role as human resources in the country's economic cycle, and it is necessary to think of a solution for them in the issues of women's entrepreneurship and creating sustainable employment.

The development of entrepreneurship based on technology and training and empowerment of women with the approach of social capacity building and strengthening of local production organizations is always considered as a solution to overcome economic problems and develop employment in less privileged areas. The development of entrepreneurship by creating stable employment and wealth generation can significantly reduce poverty and improve people's well-being, especially women heads of households. However, according to the research findings and the study of available sources in this field, the development of entrepreneurship of female heads of households is a complex and difficult process. In order to achieve it, it is necessary to provide appropriate technical, institutional, infrastructural, educational, cultural, and social fields so that women enter this sector with more readiness.

Providing technical and specialized training services in the field of how to produce and process innovative knowledge-based products, specialized and specific pieces of training in the field of packaging and product presentation, understanding consumer taste, understanding the consumer market of manufactured products, marketing, and marketing of women's products in accordance with the climatic conditions and the needs of society. These are important things that, if planned and implemented accurately, play a significant role in developing entrepreneurship and business prosperity. The government can play an irreplaceable role in this field by providing appropriate educational services that match the needs of society. Providing skill and market-oriented training services to create new skills or improve and upgrade the skills acquired in previous years, follow up and monitor events in the field of products and services, will be very effective in the quantitative and qualitative development of this matter. Creating entrepreneurship growth centers for women, especially women heads of households, providing services for the development of entrepreneurship in the form of subsidies and easy access for entrepreneurs to market information, knowledge and specialized and management technologies, without planning and predicting the appropriate mechanism according to the specific conditions of each region, is not practical. According to the research findings, the following is suggested:

Financial, legal and educational support, looking at examples of digital technological innovations for women heads of households.

Using social networks to introduce products and services provided by women heads of households.

Strengthening stable and institutionalized and networked relationships in the context of web among women heads of households by supporting women entrepreneurs who work as teams and chains.

Government investment in the field of production cooperatives and special services for women heads of households.

Training of income-generating home businesses based on technology, for women heads of households in order to enter home business and self-employment.

Forming a support unit for economic enterprises of women heads of households in the governorates and providing special advice and support to women entrepreneurs who are heads of households.

Strengthening organizations related to supporting the development of entrepreneurs and handicrafts and productions related to the presence and employment of female heads of households.

Creating facilities for easier access to financial services and facilities for business development and product export.

The attention of media, especially television, to the entrepreneurship sector of female heads of the household and the production of suitable programs on this issue and extensive advertisements regarding the attention to the fields of activity of these women in the business and employment environment.

Developing the level of education, technical and professional training related to new technologies and improving the knowledge of female heads of the household.

Finally, the development of entrepreneurship based on digital technological innovations for women heads of households can be mentioned using the technological point of view. Startup entrepreneurship; Entrepreneurship in energy and its reserves; Entrepreneurship in the field of recycling and entrepreneurship in the fields of information technology, such as the Internet of things, which is man-made; Internet of everything, which is about the management of soil, water, trees, crisis management and agriculture, etc., which is very important nowadays due to the limited resources in our country; Financial technologies (digital currencies, etc.).

#### **Ethics**

This research observed ethical standards, including obtaining informed consent and ensuring privacy and confidentiality. Also, while completing the questionnaires while emphasizing completing all the questions, the participants were free to withdraw from the

research at any time and provide individual information. They were assured that the information would remain confidential, which was strictly adhered to.

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#### **Conflict of Interest**

According to the authors, this article has no financial sponsor or conflict of interest.

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