

Research Article

The Effect of Industry Extension Services Project on the Performance of Small and Micro Enterprises

Efrem Regasa Shiferaw* 

Department of Accounting and Finance, Faculty of Business and Economics, Mattu University, Mattu, Ethiopia

Abstract

The purpose of the study was to investigate the effect of industry extension service projects on the performance of micro and small enterprises. Thus, the study utilized an explanatory and descriptive research design to achieve the objectives of the research. The study targeted MSEs that had been in operation for more than two years at the time of the study. The research had a total population of 606 MSEs, out of which a sample size of 241 operators was realized using Taro Yamane's formula. Thus, a stratified sampling technique and simple random sampling were employed to select representative samples. Beside, primary and secondary data were used in the study. The analysis was conducted using SPSS version 20 on 223 fully responded questionnaires. The data was analyzed using descriptive and inferential statistics. In addition to this, correlation and regression models were used to analyze the variables of the study. The finding proved that IESP support provided by TVET trainers to MSEs was not adequate. Regression analysis indicated that entrepreneurship, technology, kaizen, and technical skill support had a positive and significant relationship with the performance of MSEs. Thus, it is recommended that the TVET College should provide regular industry extension service support to MSEs through four packages.

Keywords

IESP, TVET College, Micro and Small Enterprises, Performance

1. Introduction

Globally, legally registered MSEs account for roughly half of total employment in most developed countries, such as the EU. Hence, MSEs are considered as the "cornerstone" of economic development, and hence, they are a driving force towards alleviating poverty and unemployment at the national level [12].

In most African countries, MSEs play vital roles in the community, such as job creation, where current trends show that SMEs in Africa create over 80% of employment [6]. For example, according to according to A Review of Empirical

Evidence from Ethiopia [3], the income contribution of the MSE sector in Tanzania was about 20–30 percent of the GDP, and they consist of more than 1 million enterprises engaging 3 to 4 million people, or about 20–30 percent of the labor force of the country

In Ethiopia, the micro and small enterprise development is the primary strategy of GTP II to expand employment and reduce poverty, particularly focusing on women and youth. Therefore, the project is designed to make the MSE sector competent enough in the domestic and international

*Corresponding author: ephaa2010@gmail.com (Efrem Regasa Shiferaw)

Received: 25 January 2024; Accepted: 21 February 2024; Published: 12 April 2024



markets through competitiveness in the market, providing high-quality products or services at a reasonable price, increasing sales, capital, and creation of employment opportunities. However, the market is full of old and previously existing products, from which the consumers already know the quality of the product or service. The ratio of MSEs' growth from existing level to the next level (from small to medium enterprises) is very small. The origin of this problem is that either the organizations may not implement the project or the project itself may not be able to deliver them.

1.1. Statement of the Problem

The designed industry extension service project provides various types of support services such as training to fill technical skill gaps; KAIZEN like 5s and 7s waste implementation; product quality improvement; productivity increase; business management and development skills; customer handling; developing entrepreneurship culture and bookkeeping skills; assessment and certification; technology adaptation and transfer; are major areas of support under the industry extension program; and all these are support services provided by technical and vocational colleges to MSEs.

Various studies [1, 4, 7] conducted that infrastructure, management experience, marketing problems, bureaucracy, raw materials, poor infrastructure, and over-tax were the most binding constraints inhibiting the performance of MSEs. What makes this study different is that it will focus on industry extension services (in terms of technical, technology, kaizen, and entrepreneurship) and their effects on the performance of MSEs.

In closing, moreover, in Ethiopia, there is no extensive research on the effect of IESP on the performance of MSEs. The earlier ones have not been extensively studied beyond the four packages.

1.2. Research Question

The study was attempted to answer the following main research Question:

What is the effect of Industry extension service on the performance of?

1.3. Objectives of the Study

General Objective

The overall objective of this study is to examine the effect of industry extension service projects on the performance of MSEs.

Specific Objectives

To achieve the general objective, the research was guided by the following specific objectives:

- 1) To determine the effect of Kaizen support on the performance of MSEs.
- 2) To examine the effect of technology support on the performance of MSEs.
- 3) To evaluate the effect of technical skill training on the performance of MSEs.
- 4) To investigate the effect of Entrepreneurship training support on the performance of MSEs.

1.4. Significance of the Study

The study is important to the government in the determination and establishment of a stronger regulatory and legal framework for the MSE sector in Ethiopia. Besides, it can help various stakeholders in MSEs, mainly Oromia Job Creation and Vocational Bureau and TVET College identify gaps inherent in their MSEs and find ways of improving their financial performance. In particular, this paper could serve as a source of reliable information for the administration job creation and vocational office.

1.5. Scope of the Study

Among the different types of MSEs business classifications based on their size, the scope of the study was limited to only micro and small business enterprises.

2. Review of Related Literatures

2.1. Definitions of Micro and Small Enterprises

Micro and small business enterprises have been identified differently by various individuals and organizations, such that an enterprise that is considered small and medium in one country is viewed differently in another country [9].

Table 1. The revised definition of micro and small enterprises in Ethiopia.

Level Of Enterprise	Sector	Head Count Staff	Total Asset (ETB)	Total Asset (USD)<2016>	Total Asset (USD)<2019>
Micro	Industry	≅5	≅100,000	≅4,630 USD	≅3,500 USD
	Service	≅5	≅50,000	≅2,310 USD	≅1,7500 USD

Level Of Enterprise	Sector	Head Count Staff	Total Asset (ETB)	Total Asset (USD)<2016>	Total Asset (USD)<2019>
Small	Industry	6-30	100,001 ~ 1,500,000	4,630 ~ 69,500 USD	3,500 ~ 52,000 USD
	Service	6-30	50,001 ~ 500,000	2,310 ~ 23,150 USD	1,7500 ~ 17,500 USD
Medium	Industry	31-100	1,500,001 ~ 20,000,000	69,500~926,000 USD	52,000 ~ 700,000 USD
Large	Industry	> 100	> 20,000,000		

Source: (Ministry of Urban Development and Housing 'Micro and Small Enterprise Development Policy & Strategy, 2016).

The objectives of the 1997 strategy framework were to facilitate economic growth and bring equitable development, create long-term jobs, strengthen cooperation between MSEs, provide the basis for medium and large-scale enterprises, promote exports, and balance preferential between MSEs and bigger enterprises [7].

2.2. Production Theory

This theory is an effort to explain the principles by which a business enterprise decides how much of each commodity that it sells it will produce, and how much of each kind of labor, raw material, or fixed capital good that it employs (its inputs or factors of production) it will use. The theory of production involves some of the main fundamental principles of economics. These include the relationships between commodity prices and the wages or rents of the productive factors used to produce them, as well as the relationships between commodity prices and productive factors on the one hand, and the quantity of these commodities and productive factors produced or used on the other.

2.3. Economic Development Theory

According to [5], the ability to develop new ideas and innovate has become a priority for many organizations. Intense global competition and technological development have made innovation be a source of competitive advantage for the success of a business enterprise [8]. Human Capital theory suggests that education and experience develop skills that enable workers to be productive [2].

2.4. Lean Management Theory

The theory of lean management developed by John [10], posits that companies are in business to make a profit. If they don't, they won't survive. There are two ways to increase profits: raising prices and lowering costs. Competitive pressures often limit the ability to do the former, so companies tend to focus on cutting costs. One of the more popular ways for companies to reduce costs is through lean management.

Lean management focuses on improving processes. Every step a product takes, from raw materials to final assembly, is reviewed. Waste or duplication of effort is identified and eliminated to the maximum extent possible. As mentioned above, the focus is on creating benefits (lower costs, quicker turn times, etc.) for the customer. A system of "continuous improvement" is established to monitor the results on an ongoing basis. The goal is to create the perfect process.

2.5. Endogenous Growth Theory and the Knowledge-Based Theory

The knowledge-based theory also distinguishes between two types of learning based on the context within which they occur. First, there is exploitative learning, which is external to micro and small business enterprises and therefore must be acquired. Second, we have explorative learning, which obtains from inside the micro small business enterprises and thus can occur only through internal experiments [13], and hence is experiential in nature.

3. Research Methodology

3.1. Research Design

The researcher used descriptive and explanatory types of research design to conduct the research work. A qualitative and quantitative approach was employed in the research to accomplish the objectives of the study.

3.2. Target Population

As at June 30, 2021, According to of Administration job creation and vocational office data, there are 606 registered and active MSEs operators in operation for more than two years. These are (180 service, 197 trade, 57 industries, 166 economic infrastructure and six agricultures). Then, the target population for the study has comprised the 606(six hundred six) registered and active MSEs.

3.3. Sources of Data and Instruments of Data Collection

The study employed both primary and secondary sources of data Primary data were collected through structured questionnaires and interview based questionnaires containing both close and open-ended from MSE’s owners. While the secondary data was taken from books, journals, thesis papers, strategies, annual reports and documents of MSEs town administration job creation and vocational office.

3.4. Sampling Design and Technique

They are as follows: 180 services, 197 trades, 57 industries, 166 construction, and six agriculture. Accordingly, this study employed a stratified random sampling technique to select the required sample of MSEs from the above-listed MSE operators for this study. Thus, the researcher divided his population into five sectors based on the types of business classifications. Finally, a simple random sample was taken from each stratum and then those sub-samples were

joined to form a complete stratified sampling..

3.5. Sample Size

For this study to select sample size a list of the population formally registered and inventoried MSEs until June 30, 2021 by the town administration and vocational office was obtained. The total population of the study is 606 MSEs, which includes agriculture (six), trade (197), service (180), construction (166) and industry (57). For this study's purpose, the researcher used the simplified formula of Taro Yemane’s Formula [11], considering 95% of confidence level and 5% margin of error sample size determination, which helps to calculate sample size. So that based on the formula adapted, the total sample can be

$$n = \frac{606}{1+606(0.05)^2}$$

$$n = 240.95 \sim 241$$

Table 2. Number of total and sample MSEs operators for the study by sector.

S/N	Types sectors	Target population (N)	Sample Size calculations	Sample Size (n)
1	Agriculture	6	6/606x241= 2.3 ~2	2
2	Trade	197	197/606x241= 78.3 ~78	78
3	Services	180	180/606x241= 71.59 ~78	72
4	Construction	166	166/606x241= 66	66
5	Industry	57	57/606x241= 22.6 ~2	23
Total		606	606/606x241=241	241

3.6. Data Analysis and Presentation

Accordingly, the data was analyzed via descriptive statistics by using mean, standard deviation, frequency, and percent. While in the case of the econometric model, the result was estimated by applying correlations, and multiple linear regression analysis. A correlation coefficient was employed to test the relationship between the variables.

3.7. Model Specification

Multiple Linear Regression Analysis was applied to investigate the effect of industry extension services projects on the performance of small and micro enterprises in the study site. An analysis of variance is used to test the significance of the model. R2 was used in this research to measure the extent of the goodness of fit of the regression model.

$$P = \beta_0 + \beta_1ES + \beta_2KS + \beta_3 TS + \beta_4 TSS + \epsilon_{it}$$

Where: P is the dependent variable (performance of MSEs).

β_0 = Constant term or the value of intercept

ES is Entrepreneurship training support KS is kaizen Support

TS is technology support

TSS is Technical skill support

ES is Entrepreneurship training support

$\beta_1, \beta_2, \beta_3, \beta_4, \beta_5$ are the coefficients associated with each independent variable ϵ_{it} is error term (Residual)

3.8. Validity and Reliability Test

Accordingly, the coefficient was determined to be 0.913, as shown in Table 3. Thus, the instrument is trustworthy because

the reliability coefficients are more than 0.9. As can be seen in the table below, the outcome of Cronach's Alpha is positive.

Table 3. Reliability Statistics.

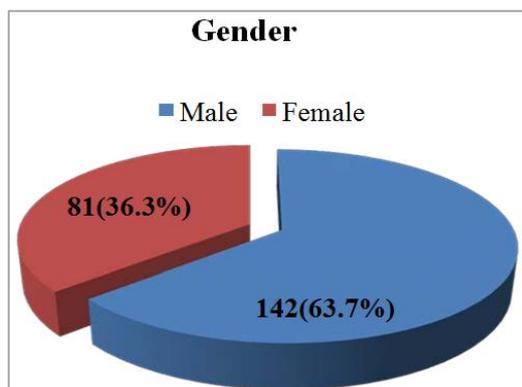
Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.909	.913	5

Source: SPSS output

4. Result and Discussion

4.1. Gender of the Respondents

Results in figure 1 below show that 142 (63.7) percent of the selected sample respondents were males and 81 (36.3) percent were females. The findings also indicate that male is dominant in MSEs' operations because the gender distribution reflects a wide variation of the gap.



Source: Survey Data

Figure 1. Male versus Female

4.2. Age of the Respondents

First, 61 (27.34) percent of respondents were between the ages of 18 and 25, followed by 132 (59.2) percent of respondents between the ages of 26 and 35; 21.9 percent of

respondents between the ages of 36 and 45, and 9 (4) percent of respondents above the age of 46. This indicates that most of the respondents were aged between 26 and 35 years old, 132 (59.2) percent. This indicates that most of the MSEs were owned and run by a youth and productive labor force.

Table 4. Distribution of Age of the respondents.

Age group	Frequency	Percentage
18-25 Year	61	27.4
26-35 Year	132	59.2
36-45 Year	21	9.4
> 46 Year	9	4.0
Total	223	100%

Source: Survey Data

4.3. Entrepreneurship Training Support on Performance of MSEs

TVET College may not support the trainees in this variable. The individual and grand mean (1.9318) values justify it very well. The individual and grand mean values in the table below clearly show that the Entrepreneurship training given to MSE's operators is not adequate enough. The standard deviation shows that not all respondents were in agreement with that since there was a small variance between answers. However, from the standard deviation of 91, we can understand that more than half of the respondents agreed with the statement.

Table 5. Descriptive Statistics of Entrepreneurship training support given to MSEs.

	N	Mean	Std. Deviation
I have acquired effective accounting skills	223	1.7444	.88131
Helped me to keep the enterprise financial source documents	223	2.3363	1.04359
Supported me to know the enterprises' assets, liabilities, and capitals	223	2.1345	.34199

	N	Mean	Std. Deviation
Helped me to know accounting and record-keeping skills	223	1.6592	.93985
I can now better implement my business plans	223	2.0045	1.00224
It helped me to daily record my costs and revenues	223	1.9372	.79163
I Supported to knowing my cash flows	223	1.9058	1.00230
My ability to take risks has been enhanced	223	1.5785	.98725
It has empowered me to know my profit and loss	223	2.0135	1.20240
Grand mean		1.9318	.91029

Source: SPSS output

4.4. Kaizen Support on Performance of MSEs

As it is shown in table below, the average mean and SD values of responses for Kaizen support equate to 2.02 and 0.93, which indicates that respondents are not certain about the kaizen effects of MSEs performance. This reveals that the Kaizen training support provided to operators of MSEs is

not sufficient. With a calculated mean value of 2.0249, the majority of respondents agreed that the majority of MSEs operators were not appropriately practicing Kaizen rules such as housekeeping rules, reducing wastage, producing materials based on customer need, improving product quality, customer satisfaction, ordering items, reducing cost, resource utilization, and value-adding. Thus, TVET College may not provide training on the continuous improvement.

Table 6. Aggregate Mean Scores of Performance and Kaizen support Factors.

	N	Mean	Std. Deviation
Helped me to apply housekeeping rules	223	1.9103	.52077
It helped me to reduce wastage	223	1.9013	1.29070
It empowered me to Produce materials based on customer need	223	2.1928	.85083
It helped me to Improve product quality	223	1.9148	.80924
It supported me to Increased customer satisfaction	223	1.8565	.90397
Helped me to reduce Cost	223	2.0897	1.35933
helped me make better use of my resources	223	2.2466	.73348
Helped to do value-adding activities	223	2.0404	1.19050
It supported me in ordering items in a hasty manner	223	2.0717	.73782
Grand mean		2.0249	0.93297

Source: SPSS output

4.5. Technology Supports on Performance of MSEs

As it is shown in table below, the average mean and SD values of responses for technology support equates to 1.9905 and 0.89740 indicates that respondents are not certain about the technology effects of MSEs' performance. This reveals that about technology training support provided to operators of MSEs is not sufficient.

Table 7. Aggregate mean scores of performance and Technology supports factor.

	N	Mean	Std. Deviation
It helped me with the selection of feasible technologies	223	.83729	.83729
It helped me to compete technologically	223	.90173	.90173
It enabled me to copy new technologies.	223	.69595	.69595
Our enterprise's innovation has helped us achieve strategic goals and objectives	223	1.51596	1.51596
It supported me to apply a new organizational structure	223	.49528	.49528
My enterprise tends toward being ahead in introducing new products/services	223	.71905	.71905
Helped me to substitute technologies to be imported	223	.75581	.75581
It enabled me to apply problem-solving technologies	223	1.16520	1.16520
Empowered me to implement new designs	223	1.03040	1.03040
Aggregate mean scores		1.9905	.89740

Source: SPSS output

4.6. Technical Skill Supports on Performance of MSEs

The results of the analysis, as shown in [table 8](#) below, showed that the mean score and SD values were 1.98 and 1.02, respectively. This reveals that technical skill training support given to operators of MSEs is not adequate.

Table 8. Aggregate mean scores of performance and technical skill supports factor.

	N	Mean	Std. Deviation
It empowered me to take care of my machines effectively	223	2.1749	.80028
I have improved my task simplicity	223	1.7713	.88363
It has Helped me to reduce task redundancy	223	2.1749	1.02706
It enabled machinery to operate on the company's premises	223	1.9821	1.64936
It helped me fill in the identified gaps	223	2.0448	.49114
My machine repair skills have improved	223	1.9821	.68421
Improve efficiency	223	1.6099	.77418
I can identify and analyze problems in complex situations	223	2.1839	1.52378
My Enterprise has been able to establish linkages with other alliances in order to gain access to goods and services.	223	1.9327	1.35897
Grand Mean		1.9841	1.02140

Source: SPSS output

4.7. Performances of MSEs (Dependent Variable)

The overall performance of MSEs as measured by the nine parameters in table clearly reveals that it is extremely low. Thus, based on the descriptive statistics in [table 9](#), the mean score and SD of MSEs' performance was 2.0135 and .98236, which indicates the respondents disagreed to a small extent that their businesses performed extremely poorly. The mean values in the table clearly indicate that MSEs have very poor performance.

Table 9. Business Performance.

	N	Mean	Std. Deviation
My business has been able to increase its sales consistently	223	2.1659	1.29598
Helped us improve market share growth	223	1.9776	1.01982
It helped me enter new markets	223	2.3184	.93094
We often launch new products/services into the market	223	2.2197	.60862
Our employees' numbers have increased.	223	2.0045	1.00224
We have experienced a steady increase in year-on-year profitability	223	1.9372	.79163
Capital investment has improved	223	1.9058	1.00230
Our productivity has improved significantly	223	1.5785	.98725
We have reduced costs	223	2.0135	1.20240
Grand mean/Aggregate Score		2.0135	.98236

Source: SPSS output

4.8. Correlation Analysis of Industry Extension Service Project and Performance of MSEs

Table 10. Correlation table on performance and industry extension service project.

		Performance	Entrepreneurship	Kaizen	Technical	Technology
Performance	Pearson Correlation	1	.837**	.843**	.706**	.653**
	Sig. (2-tailed)		.000	.000	.000	.000
	N	223	223	223	223	223
Entrepreneurs hip	Pearson Correlation	.837**	1	.688**	.685**	.612**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	223	223	223	223	223
Kaizen	Pearson Correlation	.843**	.688**	1	.631**	.552**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	223	223	223	223	223
Technical	Pearson Correlation	.706**	.685**	.631**	1	.567**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	223	223	223	223	223
Technology	Pearson Correlation	.653**	.612**	.552**	.567**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	223	223	223	223	223

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation matrix/table tells us there is a positive relationship between entrepreneurship, Kaizen, technology,

and technical skill and the performance of MSEs, and they are moving positively in the same direction, or the relation-

ship is positive. This implies that IES support given in the areas of fourth packages can bring remarkable results in the performance of MSEs.

4.9. Model Summary

A linear regression analysis has been conducted in order to examine the contribution of independent variables that affect the dependent variable. Based on the study, the correlation coefficient

(r) was .921. Therefore, this implies that there is a strong relationship between industry extension service projects and the performance of MSEs. And R square value is .848.

This revealed that the dependent variable (Performance of MSEs) is 84.8% explained by the four industry extension support packages (independent variables: Technical, Technology, Kaizen, and Entrepreneurial support). So in this study, the only explanatory variables were technical, technology, kaizen, and entrepreneurship supports.

Table 11. Industry extension service project and Performance Model Summary.

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.921 ^a	.848	.845	.23321

a. Predictors: (Constant), Technology, Kaizen, Technical skill, Entrepreneurship

5. Conclusion and Recommendations

5.1. Conclusion

The study concludes that, industrial extension service supports provided through TVET trainers to MSEs do not bring requested improvement in the performance of MSEs and the overall effect of the service packages on the performance of MSEs is very poor.

5.2. Recommendations

The study suggested that the Government of Ethiopia should develop and implement the curriculum and training materials for this project. Hence, the government should come up with a forum that creates awareness among MSEs owners on the importance of the adoption of industry extension service projects. The study also recommended that the TVET College should provide regular industry extension service support to MSEs through fourth packages.

Abbreviations

AATVETA	Addis Ababa Technical and Vocational Education Training
GDP	Growth Domestic Product
EU	European Union
GTP	Growth and Transformation Plan
IES	Industrial Extension Services
IESP	Industrial Extension Services Project
IMF	International Labor Organization
MIP	The Micro Enterprise Innovation Project

MoE	Ministry of Education
MSEs	Micro and Small Business Enterprises
MSMEs	Micro, Small and Medium Enterprises
NGOs	Non-Governmental Organizations
SMEs	Small and Medium Enterprises
SPSS	Statistical Package for Social Sciences
TVET	Technical and Vocational Education and Training Institutions
USAID	United States Agency for International Development
U.S.	United States

Author Contributions

Efrem Regasa Shiferaw is the sole author. The author read and approved the final manuscript.

Conflicts of Interest

The authors declare no conflicts of Interest.

References

- [1] Antenane Abeiy, E. (n. d.). Factors affecting performance of Micro and Small Enterprises in Addis Ababa: The case of Addis Ketema Sub City Administration (City Government of Addis Ababa). Addis Ababa University, Ethiopia.
- [2] Becker G. (n.d.). Human Capital. 2nd edition. Columbia University Press, New York; 1964.
- [3] Bereket, T. (n.d.). The Role of Micro and Small Enterprises in Employment Creation and Income Generation A Survey Study of Mekelle City, Ethiopia, Mekelle University Thesis.

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- [4] Berihu G. (2017). Determinants Of Micro And Small Enterprises Performance In Godere Woreda Of Gambella Regional State, Ethiopia, Arba Minch University, Ethiopia.
- [5] Drucker, P. F. (1999). Knowledge-Worker Productivity: The Biggest Challenge. *California Management Review*.
- [6] Endris, E., & Kassegn, A. (2022). The role of micro, small and medium enterprises (MSMEs) to the sustainable development of sub-Saharan Africa and its challenges: a systematic review of evidence from Ethiopia. *Journal of Innovation and Entrepreneurship*.
- [7] Esmael, S. (2014). Capital Growth Constraints of Micro and Small Enterprises: The Case of Jimma Town. Jimma University, Ethiopia.
- [8] Hollenstein, H. (1996). A composite indicator of a firm's innovativeness. An empirical analysis based on survey data for Swiss manufacturing. *Research Policy*.
- [9] Kassa, E. T. (2021). Determinants of the continuous operations of micro and small enterprises during COVID-19 pandemic in Ethiopia. *Journal of Innovation and Entrepreneurship*.
- [10] Krafcik, J. F. (1988). Triumph of the Lean Production System. *Sloan Management* 30, 41-52.
- [11] Yamane, T. (1967). *Statistics: An Introductory Analysis* (No. HA29 Y2 1967).
- [12] Yitagesu, M. (n.d.). Impact of Trainings on the Performance of Micro and Small Enterprises in Lideta Sub-City Addis Ababa Town. Addis Ababa University.
- [13] Zahra, S. A., Nielsen, A. P., & Bogner, W. C. (1999). Corporate Entrepreneurship, and Competence Development", *Entrepreneurship Theory and Development*, spring. 169-189.