The Effect of Organizational Learning and Knowledge Management on the Innovation Performance of Companies in Technology Parks

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Abstract: The main purpose of this study is to find out whether there is a relationship between organizational learning, knowledge management and innovation in the Science and Technology Parks in Turkey. The study will also present theoretical information about these concepts as well as revealing the reflection of practices in these fields on innovation performance. In the research part of the study, the effects and existing relationships of organizational learning and knowledge management on innovation performance in companies located in technology parks were studied. The reason for choosing technology parks is that technology parks play an important role in the development, innovation, and the advancement of technology as well as be seen to increase the per capita income. It is thought that the organizational learning, knowledge management and innovation performances of these companies should undoubtedly be different from other industries and clusters. In this context, an empirical quantitative survey was conducted with 319 companies in 5 different technology parks in Turkey. The findings of the study support the positive effect of organizational learning and knowledge management on innovation performance.

Keywords: Knowledge Management, Organizational Learning, Innovation, Technology Parks

1. Introduction

With the rapid development of globalization and technology, it is important for companies to manage their resources correctly in order for their strategies to be successful. Today, due to these developments, data, information and knowledge resources, i.e. "conceptual resources", have become indispensable. The concepts of knowledge management, organizational learning and innovation, on which Knowledge is based, have been discussed separately by researchers within the framework of competitive advantage. (Carneiro, 2000; Caroline & Angel, 2011; Deise Graziele Dickel, 2016; Castro, 2015; Therin, 2003)

Since the Classical Greek Era, the concept of knowledge has been on our agenda epistomogically. (Alavi & Leidner, 2001). In the new world, we see that Artificial Intelligence has begun to benefit companies that produce, integrate and protect (Birzniece, 2011) in gaining competitive advantage. In this situation, the relationship between knowledge Management, organizational learning and innovation performances becomes more important in the paradigm shift where “knowledge” is at the center. (Drucker, 1993)

In today's world where capacities of organizational learning and knowledge transfer can be viewed as the most valuable assets (Genç, 2011), one of the main places where knowledge is produced is within the university system. The relationship between knowledge management, organizational learning and innovation performance has been examined in technology parks, which we can call high-tech and knowledge-based industrial market (Castro, 2015), where university-industry cooperation is actively carried out in universities. (Kör, 2013) It is expected that this study will add a vision to many new researches in terms of being at the intersection of 3 main study areas in the literature, "Knowledge Management", "Organizational Learning" and "Innovation". All three areas are critical in the transformation of organizations. Universities are among the points where knowledge-based transformation is experienced at the highest level, and another valuable point of this study is that it is carried out in technology parks.

This paper investigates the relationships among knowledge management, organizational learning, and innovation in companies in technology parks. We use LISREL to model these relationships based on the data sampled from 319 companies. 48.9% of these companies are startup companies, 51.1% are not startups. The rest of the paper is organized as follows. Section 2 reviews the literature and proposes the research map. Section 3 describes the research methodology including framework and hypotheses. Section 4 describes the data analysis and the results. Section 5 discusses managerial implications and section 6 presents a brief conclusion.

2. Literature Review and Hypotheses

2.1 Knowledge management

There are many definitions in the literature on knowledge management. (Alavi & Leidner, 2001; Drucker, 1993; Nonaka, 1995) In particular, Knowledge Management's global interest in the business world started with major cost reductions and analyzes for global companies that led to increased company performance. Although there are different definitions in the literature, American Productivity and Quality Center's definition that is "a conscious strategy of getting the right knowledge to the right people at the right time, and helping people share and put information into action in ways that strive to improve organizational performance". This has been one of the most generally accepted definitions. (Cavaleri, 2004; Costa, 2016; Donate, 2011) When looking at the concept of knowledge management, paying attention to the distinction between data, information, and knowledge plays an important role to position the concept correctly. (Aggestam, 2006; Cavaleri, 2004)

Information is the processed data (the "who" "what"). Knowledge is verified and value-added information (the "way" and how") (Alavi & Leidner, 2001; Darroch, 2000). Knowledge has a subjective character and is personalized information with concepts, comments, ideas, observations and judgments. (Alavi & Leidner, 2001; Bennet & Bennet, 2004; Darroch, 2000) This knowledge which emerges as a personal accumulation and awareness, is also called make up knowledge in organizational terms . (Drucker, 1993) (data, information, facts, truths, concepts, opinions, judgement, intuition, insight, experience, predictability, etc.) (Bennet & Bennet, 2004). Make up knowledge is a manageable asset that can be shared, stored, transferred to other individuals, in short, for companies to gain competitive advantage. (Alavi & Leidner, 2001) Along with making the information in individuals meaningful for the organization, we can also talk about a collective knowledge formation about the organization independent of individuals. (Alavi & Leidner, 2001; Alegre, Sengupta, & Lapiedra, 2013; Mardani, Nikoosokhan, Moradi, & Doustar, 2018; Du Plessis, 2007; Gloet, 2004) In general, we see in different studies in the literature that knowledge is divided into types in order to manage knowledge. When we look at these types, we see that tacit, explicit, individual, social, declarative, procedural, causal, conditional, relational, pragmatic types are defined in the literature. (Alavi & Leidner, 2001; Caroline & Angel, 2011; Chiva, 2005) Again, placing information in various data warehouses and software information reservoirs is important for managerial decisions. (Argote, 2011; Davenport & Prusak, 1998) When we look at the stages of knowledge management, we see creating, organizing, sharing and using knowledge" activities. (Mardani, Nikoosokhan, Moradi, & Doustar, 2018; Cavaleri, 2004)

2.2 Organizational learning

For some time it has been said that the ability to learn faster than competitors is the most important competitive advantage. (Aggestam, 2006) If an organization learns more slowly than its environment or its competitors; in other words, if it does not have the capacity to acquire and produce the necessary information, it is doomed to disappear. (Adams, Day, & Dougherty, 1998; Bennet & Bennet, 2004) When we look at the concepts related to organizational learning, we come across the concepts of "Learning", "Organizational Learning" and "Learning Organizations" and all three of them are "acquiring information", "interpreting data", "developing knowledge", "sustaining learning" processes and thus are a social process. (Aggestam, 2006; Cavaleri, 2004; Therin, 2003) Learning takes place in the change of an individual's knowledge, that is, knowledge is an inevitable product of learning activities, but not every individual learning means organizational learning. (Aggestam, 2006; Bennet & Bennet, 2004; Cavaleri, 2004)

Learning takes place in three stages: acquisition, communication and exploitation of knowledge. (Therin, 2003; Adams, Day, & Dougherty, 1998) In addition, while the debate continues on whether this information change is a cognitive change or a behavioral change, the view that both should be accepted comes to the fore. (Argote, 2011; Chawla, 2011) In order for organizational learning to take place, individuals' learning, that is, their knowledge, must be embedded in the organization. In other words, even if the individual leaves, if that knowledge is continued by other individuals in the organization, we can talk about the existence of organizational learning. (Argote, 2011; Bennet & Bennet, 2004) Inside the wild and uncertainty environment, smart business must keep learning to preserve its competitiveness. And, organizational learning will develop well based on well structured knowledge in organizations. In other words, business could have capabilities which is related with organization learning underlying well individual learning. (Nonaka, 1995; Liao & Wu, 2010) The assimilation and acceptance of knowledge by the firm is one of the important processes of organizational learning. (Therin, 2003) We see that the learning capabilities of companies are very dynamic, especially in situations of uncertainty and external challenge. (Bennet & Bennet, 2004) According to Senge, the organization

of learning focuses on creating a structure according to 5 learning disciplines. These; Staff Mastery, 2. Mental Models, 3. Team Learning, 4. Shared Vision, 5.System's Thinking. (Senge, 1997) Organizational learning is a set of organizational process and depends on leadership, structure strategy, environment, technology and culture factors. (Bennet & Bennet, 2004; Therin, 2003; Genç, 2011) Organizational learning are differentiated by their occurrence levels as single-loop (or corrective), doble-loop (or generative) and meta-(or institutional) learning. (Therin, 2003)

2.3 Innovation

According to the rapidly developing innovation literature, innovation capability is the most critical notion of the business industry. (Calantone, Cavusgil, & Zhao, 2002; Deise Graziele Dickel, 2016) The relationship between global economic growth and innovation is obvious, as it can be evaluated in the development of new products and shortening of product lifecycles. (Du Plessis, 2007) In addition, with the constant change of customer needs, innovation becomes more complex under the pressure of rapid technological developments and competition. (Du Plessis, 2007) The factor that fundamentally affects the performance, survivability, and competitiveness processes of companies is innovation. (Kör, 2013; Liao & Wu, 2010) An innovation may be a new product, new service, a new production technology, a new structure or new administrative system, or a new plan or program for organization or organizational members. (Liao & Wu, 2010) Innovation is described as the implementation of both discoveries and inventions and the process that is new or improved done by an organization to create value, by which outcomes, whether products, systems or processes, come into being. (Gloet, 2004; Calantone, Cavusgil, & Zhao, 2002; Kör, 2013) Innovation is the generation, acceptance, and implementations of new ideas, processes, products, or services. (Calantone, Cavusgil, & Zhao, 2002; Caroline & Angel, 2011; Deise Graziele Dickel, 2016) Innovation is the result of restructuring of previously existing conceptual and physical assets of companies. (Mardani, Nikoosokhan, Moradi, & Doustar, 2018)

For innovation to happen, a company needs creative people who are willing to share, and the ability to turn ideas into practical products and services for the good of the company. (Brand, 1998) Innovation is about implementing ideas. Innovation process highly depends on knowledge, specially tacit knowledge rather than explicit knowledge. (Mardani, Nikoosokhan, Moradi, & Doustar, 2018; Gloet, 2004; Caroline & Angel, 2011) Form innovativeness has two dimensions. These are “behavioral variable” and “organization's willingness to change”. (Calantone, Cavusgil, & Zhao, 2002) In this study, we will also discuss the 4 dimensions of innovation, namely product innovation, market innovation, process innovation, and strategic innovation. (Vila N. &.-B., 2007)

2.4 Relations and Hypotheses

2.4.1 Organizational Learning and Innovation

Knowledge creation depends on both internal and external learning. (Alegre, Sengupta, & Lapiedra, 2013) The performance of organizations depends on the extent to which managers can mobilize all knowledge resources at their disposal and transform them into value-creating activities (Alavi & Leidner, 2001; Alegre, Sengupta, & Lapiedra, 2013). These knowledge and learning systems have a positive impact on innovation processes and outcomes. (W.R., 2009; Alegre, Sengupta, & Lapiedra, 2013) There is also empirical evidence showing that there is a positive impact of learning and knowledge creation on innovation outcomes. (Alegre, Sengupta, & Lapiedra, 2013)

In an organization where understanding and the ability to take effective action are major challenges due to the environment or the nature of the work, both knowledge management and organizational learning become critical factors in long-term survival. (Bennet & Bennet, 2004) Researchers have agreed that organizational learning is associated with the development of new knowledge, which is crucial for firm innovation capability and firm performance. (Calantone, Cavusgil, & Zhao, 2002)

Organizational learning is likely positively related to innovation. If a company is good at assimilating new knowledge and articulating existing knowledge, this company should be good at creating innovations (product or process). Furthermore, the better the organizational learning process, the greater the capacity to develop radical innovations (product or process) will be related. (Therin, 2003) Thus, this study propose,
H1: Organizational learning will effect innovation positively

2.4.2 Knowledge Management and Innovation

Knowledge is a key and important part of all forms of innovation, and a firm's successful performance and innovation capability are closely related to its ability to develop new knowledge. (Chapman, 2006) Knowledge management is claimed to increase innovation and responsiveness. (Alavi & Leidner, 2001) Firms that innovate need a sophisticated Knowledge Management that pays a lot of attention to the specific requirements of interactive information and the dimensions of knowledge creation. (Mardani, Nikoosokhan, Moradi, & Doustar, 2018) Research on knowledge creation by Nonaka (1995) sees knowledge as a fundamental requirement for innovation and competitiveness. Knowledge management systems have a distinctive contribution in the development of sustainable competitive advantage through innovation. (Du Plessis, 2007) To understand knowledge management and innovation processes in industrial markets, concepts as absorptive capacity, open innovation, market orientation, or relational learning, are key theoretical developments that help to explore the increased complex knowledge management, innovation process, and competitive advantage in knowledge-intensive and technology-based industrial markets (Castro, 2015) Therefore, this study propose,

H2: Knowledge management will effect innovation positively

3. Research methodoloy

3.1 Sample

Science and Technology Parks are a result of developments in the industrial field after the industrial revolution in England. (Vila & Pages, 2008) Science and technology parks are a prominent element in regional development strategies and are centers that contribute to the development of innovation policies. (Goldstein & Luger, 1990; Urriago, Barge-Gil, & Rico, 2016; Vila & Pages, 2008)

In recent years, commercialization has gained great importance due to its active participation in knowledge transfer, economic growth, job creation and entrepreneurship. There is much evidence to show the role that university incubators and technology parks play in perfecting commercialization. (Jamil, Ismail, & Mahmood, 2015) Science and technology parks create a catalyst effect by providing an environment that facilitates the spread of innovation and knowledge. (Jamil, Ismail, & Mahmood, 2015)

According to the International Association of Science Parks (IASP), “a science park is an organization managed by specialized professionals, whose main aim is to increase the wealth of its community by promoting the culture of innovation and the competitiveness of its associated businesses and knowledge -based institutions.” When we look at the previous studies, such as Ar & Baki (2011), carried out in Science and Technology Parks in Turkey, conducting a study in this area becomes not only an exciting but also necessary task.

The firms selected for empirical study were chosen from the companies listed in technology universities (Middle East Technical University, Istanbul Technical University, Yıldız Technical University, Hacettepe University, Technopark Izmir). Therefore, a total of 790 questionnaires were mailed between July 2022 and November 2022, with 319 valid and complete responses used for subsequent quantitative analysis. The useable response rate was 40.3%. The descriptive statistics for samples are listed in Table 1.

Table 1 Descriptive Statistics

Descriptive Statistics	Items	Numbers	Percentage (%)
Company Profile	Startup	156	48,9
	Not Startup	163	51,1
Gender	Male	205	64,3
	Female	114	35,7
Education	High School	9	2,8
	College	5	1,6
	Undergraduate & Graduate	305	95,6
Age	25 and lower	24	7,5
	26-35	156	48,9
	36-45	99	31
	46-55	31	9,7
	56 and older	9	2,8
Years in Industry	5 and lower	110	34,5
	6-10	91	28,5

Descriptive Statistics	Items	Numbers	Percentage (%)
	11-15	49	15,4
	16-20	26	8,2
	21 and more	43	13,5
Position	Founder/Owner	109	34,2
	Chairperson	3	0,9
	General Manager/CEO	22	6,9
	Department Manager	95	29,8
	Specialist	74	23,2
	Other	16	5

3.2 Measurement

In the first part, in order to determine the demographic characteristics of the participants, gender, age, education level, year worked in the institution, etc questions will be asked. In the second part of the questionnaire, the scale developed by Calantone, Cavusgil, & Zhao (2002) was used to measure the level of organizational learning. Organizational learning scale consists of four dimensions and 17 statements: commitment to learning (4 statements), shared vision (4 statements), open-mindedness (4 statements), and knowledge sharing within the organization (5 statements). (Calantone, Cavusgil, & Zhao, 2002)

Third part is based on knowledge management scale; an knowledge management scale prepared by Lee et al. (2005) influenced by Churchill (1979). Scale consists of three different dimensions: the use of knowledge, the collection of knowledge, and the sharing of knowledge. These dimensions are measured with a total of 17 propositions. (Lee, 2005) Forthly the innovation scale has been used to determine the innovation activities in organizations, the innovation scale created by Vila and Kuster. (Vila N. &.-B., 2007) The scale includes 25 statements and 4 dimensions to evaluate product, strategy, process and marketing innovation. (Vila N. &.-B., 2007)

4. Results

4.1 Factor Analysis

Our research scale is structurally composed of 3 parts. First of all, the scales that make up each section were handled separately, and the sub-dimensions in the scale structure were tried to be revealed. For this purpose, factor analyzes were applied for each scale. While applying the factor analysis, items with factor loading equally on the sub-dimensions are excluded from the analysis in order to reduce the correlation between the dimensions.

Table 1: Kaiser-Meyer-Olkin and Barlett's Tests

Organizaional Learning	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,855
	Bartlett's Test of Sphericity	Approx. Chi-Square	2477,304
		df	105
		Sig.	0
Knowledge Management	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,904
	Bartlett's Test of Sphericity	Approx. Chi-Square	3185,061
		df	136
		Sig.	0
Innovation	Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		0,913
	Bartlett's Test of Sphericity	Approx. Chi-Square	3620,494
		df	153
		Sig.	0

Table 2: Factors Cronbach Alfa Analysis

Factors	Sub-Factors	Cronbach α
Organizational Learning	Commitment to Learning	0,88
	Open-Mindedness	0,8
	Shared Vision	0,85
	Intra-organizational Knowledge	0,67
Knowledge Management	Knowledge Accumulation	0,88
	Knowledge Sharing	0,88
	Knowledge Utilization	0,7

Factors	Sub-Factors	Cronbach α
Innovation	Market Innovation	0,83
	Strategy Innovation	0,88
	Process Innovation	0,89
	Product Innovation	0,73

Within the scope of the research, after determining the suitability of the number and structure of the data collected with the Organizational Learning Scale for factor analysis, factor analysis was applied to the scale by using the varimax rotation method. As a result of factor analysis, it was determined that 4 sub-dimensions that make up the Organizational Learning Scale and these dimensions explain 69.1% of the total variance. Each dimension was named according to the items constituting these 4 sub-dimensions, and the Cronbach Alpha numbers measuring reliability were calculated. When the calculated Cronbach Alpha numbers are examined, the first 3 dimensions are at an acceptable level, while the calculated for the last dimension is close to the acceptable limit of 0.70. As a result of factor analysis, it was determined that 3 sub-dimensions that make up the knowledge management scale and these dimensions explain %81 of the total variance. Each dimension was named according to the items constituting these 3 sub-dimensions and the Cronbach Alpha numbers measuring reliability were calculated. When the calculated Cronbach Alpha numbers are examined, all 3 sub-dimensions are at an acceptable level. As a result of factor analysis, it was determined that 3 sub-dimensions that make up the innovativeness scale and these dimensions explain 62.7% of the total variance. Each dimension was named according to the items constituting these 3 sub-dimensions and the Cronbach Alpha numbers measuring reliability were calculated. When the calculated Cronbach Alpha numbers are examined, all 3 sub-dimensions are at an acceptable level.

4.2 Regression Analysis

In the regression analysis, innovation is the dependent variable, other factors whose effect is tried to be measured: organizational learning sub-dimensions are included in the model as independent variables. In order to measure the H1 hypothesis, sub-dimensions of innovation: Market-Oriented Process Innovation, Product Development-Oriented Process Innovation and Product Innovation, sub-hypotheses were created and tested for each.

H1: Organizational learning will effect innovation positively
H1.1.: Organizational learning will effect market-oriented process innovation positively
H1.2.: Organizational learning will effect product development-oriented process innovation positively
H1.3.: Organizational learning will effect product innovation positively

In the regression analysis, innovation is the dependent variable, other factors whose effect is tried to be measured: organizational learning sub-dimensions are included in the model as independent variables. In order to measure the H1 hypothesis, sub-dimensions of innovation: Market-Oriented Process Innovation, Product Development-Oriented Process Innovation and Product Innovation, sub-hypotheses were created and tested for each.

H1.1.: Organizational learning will effect market-oriented process innovation positively

Table 3: H1.1. Organziational Learning & Market-oriented process innovation

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,414	0,407	55,562	,000*				
(Constant)					0,84	0,248	3,384	0,001*
OLF1CommitmenttoLearning					0,081	0,05	1,604	0,11
OLF2OpenMindedness					0,273	0,051	5,322	,000*
OLF3SharedVision					0,199	0,053	3,568	,000*
OLF4IntraorganizationalKnowledge					0,306	0,04	6,395	,000*

Predictors: (Constant), OLF1CommitmenttoLearning, OLF2OpenMindedness, OLF3SharedVision, OLF4IntraorganizationalKnowledge. Dependent variable: Market-Oriented Process Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance) conducted to investigate the validity of the model established for the analysis of the factors that have an impact on Market-Oriented Process Innovation,

that is, whether the change between variables occurred by chance (F=55,562), our model is statistically significant at the p=0.000 significance level. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Market Oriented Process Innovation is 0.407. This model explains 40.7% of the change in Market Driven Process Innovation. However, when the statistical significance of the coefficients, t-statistics and the calculated p<0.05 values for them were examined, no finding was found that the Commitment to Learning factor had an effect on Market-Oriented Process Innovation. Open-Minded, Shared Vision and Knowledge Sharing; It has been determined that it has a positive effect on Market Oriented Process Innovation. The equation of the resulting model is: Market Oriented Process Innovation=0.840+0.273* Open Mindedness +0.199* Shared Vision +0.306* Knowledge Sharing

H1.2.: Organizational learning will effect product development-oriented process innovation positively

Table 4: H.1.2. Organizational Learning & Product development-oriented process innovation

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,223	0,213	22,568	,000*				
(Constant)					2,699	0,235	11,49	,000*
OLF1CommitmenttoLearning					0,046	0,047	0,786	0,433
OLF2OpenMindedness					0,082	0,049	1,395	0,164
OLF3SharedVision					0,276	0,05	4,301	,000*
OLF4IntraorganizationalKnowledge					0,2	0,038	3,621	,000*

Predictors: (Constant), OLF1CommitmenttoLearning, OLF2OpenMindedness, OLF3SharedVision, OLF4IntraorganizationalKnowledge. Dependent variable: Product Development-oriented Process Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance), which was conducted to investigate the validity of the model established for the analysis of the factors that have an impact on the Product Development-Oriented Process Innovation, that is, whether the change between the variables occurred by chance (F=22,568), our model was statistically significant at the p=0.000 significance level. It is meaningful. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Product Development-Oriented Process Innovation is 0.213. This model explains 21.3% of the change in Product Development Driven Process Innovation. However, when the statistical significance of the coefficients, t-statistics and their calculated p<0.05 values were examined, no finding was found that the factors of Commitment to Learning and Open-mindedness had an effect on Product Development Oriented Process Innovation. Shared Vision and Knowledge Sharing; It has been determined that it has a positive effect on Product Development-Oriented Process Innovation. The equation of the resulting model is: Product Development-Oriented Process Innovation=2,185+0.234* Commitment to Learning +0.261* Shared Vision +0.173* Knowledge Sharing

H1.3.: Organizational learning will effect product innovation positively

Table 5: H.1.3. Organizational Learning & Product Innovation

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,322	0,313	37,219	,000*				
(Constant)					2,185	0,206	10,6	,000*
OLF1CommitmenttoLearning					0,234	0,042	4,297	,000*
OLF2OpenMindedness					0,078	0,043	1,416	0,158
OLF3SharedVision					0,261	0,044	4,363	,000*
OLF4IntraorganizationalKnowledge					0,173	0,033	3,358	,001*

Predictors: (Constant), OLF1CommitmenttoLearning, OLF2OpenMindedness, OLF3SharedVision, OLF4IntraorganizationalKnowledge. Dependent variable: Product Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance) conducted to investigate the validity of the model established for the analysis of the factors that have an effect on the product innovation, that is, whether the change between the variables occurred by chance (F=37,219), our model is statistically significant at the p=0.000 significance level. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Product Innovation is 0.313. This model explains 31.3% of the variation in Product Innovation. However, when the statistical significance of the coefficients, t-statistics and the calculated p<0.05 values for them were examined, no finding was found that the Open-Minded factor had an effect on Product Innovation. Commitment to Learning, Shared Vision and Knowledge Sharing; It has been found to have a positive effect on Product Innovation.

The equation of the resulting model is:
Product Innovation=2,185+0.234* Commitment to Learning +0.261* Shared Vision +0.173* Knowledge Sharing
H2: Knowledge management will effect innovation positively
H2.1.: Knowledge management will effect market-oriented process innovation positively
H2.2.: Knowledge management will effect product development-oriented process innovation positively H2.3.: Knowledge management will effect product innovation positively
H2.1.: Knowledge management will effect market-oriented process innovation positively

Table 6: H.2.1. Knowledge Management & Market

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,52	0,516	113,84	,000*				
(Constant)					0,968	0,217	4,461	,000*
KMF1KnowledgeAccumulation					0,325	0,062	5,372	,000*
KMF2KnowledgeSharing					0,062	0,062	1,161	0,247
KMF3KnowledgeUtilization					0,42	0,045	8,055	,000*

Predictors: (Constant), KMF1KnowledgeAccumulation, KMF2KnowledgeSharing, KM3KnowledgeUtilization. Dependent variable: Market-Oriented Process Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance) conducted to investigate the validity of the model established for the analysis of the factors that have an impact on Market-Oriented Process Innovation, that is, whether the change between variables occurs by chance (F=113,838), our model is statistically significant at the p=0.000 significance level. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Market Oriented Process Innovation is 0.516. This model explains 51.6% of the change in Market Driven Process Innovation. However, when the statistical significance of the coefficients, t-statistics and the calculated p<0.05 values for them were examined, no finding was found that the Knowledge Sharing factor had an effect on Market-Oriented Process Innovation. Information Collection and Use of Information; It has been determined that it has a positive effect on Market Oriented Process Innovation. Equation of the resulting model: Market Oriented Process Innovation=0.968+0.325* Knowledge Accumulation +0.420* Knowledge Utilization

H2.2.: Knowledge management will effect product development-oriented process innovation positively

Table 7: H2.2.: Knowledge management will effect product development-oriented process innovation

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,434	0,428	80,384	,000a				
(Constant)					1,801	0,194	9,298	,000*
KMF1KnowledgeAccumulation					0,411	0,055	6,249	,000*
KMF2KnowledgeSharing					0,302	0,056	5,178	,000*
KMF3KnowledgeUtilization					0,006	0,04	0,108	0,914

Predictors: (Constant), KMF1KnowledgeAccumulation, KMF2KnowledgeSharing, KM3KnowledgeUtilization. Dependent variable: Product Development-oriented Process Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance), which was conducted to investigate the validity of the model established for the analysis of the factors that have an impact on the Product Development-Oriented Process Innovation, that is, whether the change between the variables occurred by chance (F=80,384), our model was statistically significant at the p=0.000 significance level. is meaningful. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Product Development-Oriented Process Innovation is 0.428. This model explains 42.8% of the change in Product Development Driven Process Innovation. However, when the statistical significance of the coefficients, t-statistics and the calculated p<0.05 values for them were examined, no finding was found that the Use of Information factor had an effect on Product Development Oriented Process Innovation. Information Collection and Information Sharing; It has been determined that it has a positive effect on Product Development-Oriented Process Innovation. The equation of the resulting model is: Product Development-Oriented Process Innovation=1.801+0.411* Knowledge Accumulation +0.302* Knowledge Sharing

H2.3.: Knowledge management will effect product innovation positively

Table 8: H2.3.: Knowledge management will effect product innovation

Variables	R^2	R^2 (revized)	F	Sig. F (p)	Beta	SE B	t	Sig.t (p)
Model	0,434	0,428	80,384	,000a				
(Constant)					1,801	0,194	9,298	,000*
KMF1KnowledgeAccumulation					0,411	0,055	6,249	,000*
KMF2KnowledgeSharing					0,302	0,056	5,178	,000*
KMF3KnowledgeUtilization					0,006	0,04	0,108	0,914

Predictors: (Constant), KMF1KnowledgeAccumulation, KMF2KnowledgeSharing, KM3KnowledgeUtilization. Dependent variable: Product Innovation *statistically significant coefficients.

According to the results of the F-test (ANOVA; analysis of variance) conducted to investigate the validity of the model established for the analysis of the factors that have an effect on the product innovation, that is, whether the change between the variables occurred by chance (F=42,825), our model is statistically significant at the p=0.000 significance level. According to this result, our model is valid. T-tests were performed to investigate whether the coefficients (beta) calculated in the model were different from zero.

The R^2 value of the model that explains the change in Product Innovation is 0.283. This model explains 28.3% of the change in Market Driven Product Innovation. When the statistical significance of the coefficients, t-statistics and the calculated p<0.05 values for them are examined; It has been found to have a positive effect on Product Innovation. The equation of the resulting model is: Product Innovation=2.373+0.257* Knowledge Accumulation + 0.225* Knowledge Sharing +0.134* Knowledge Utilization

5. Discussion & Conclusion

This research examines the relationships between knowledge management, organizational learning and innovation performance. We can state that the concepts of Knowledge Management, Organizational Learning and Innovation are fed from the same source in the center of Resource-Based theory and even Knowledge-Based theory. (Bennet & Bennet, 2004; Gloet, 2004; Nonaka, 1995; Chapman, 2006) According to our research, there is a positive relationship between knowledge management, organizational learning and innovation performance in companies located in technology parks in Turkey.

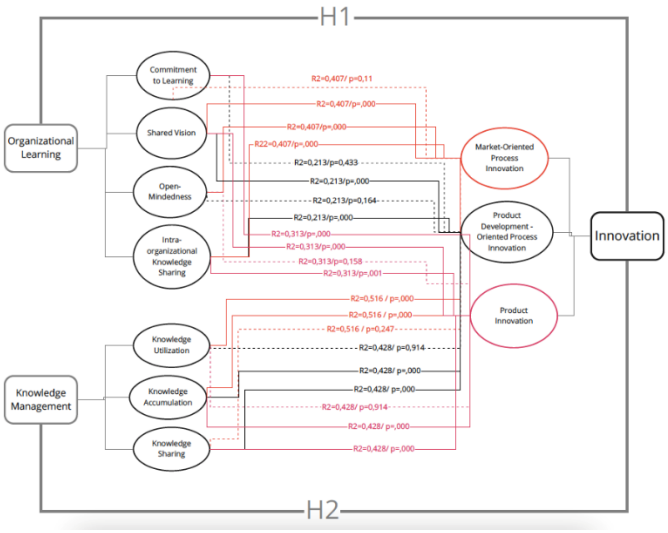

Figure 1: OL and KM on Innovation Relations

When the effect of **Organizational Learning on Innovation** was examined, there was no finding that the Commitment to Learning factor had an effect on Market-Oriented Process Innovation. Open-Mindedness, Shared Vision and Intra-organizational Knowledge Sharing; It has been determined that it has a positive effect on market-oriented Process Innovation. There was no finding that the factors of Commitment to Learning and Open-Mindedness have an effect on Product Development Oriented Process Innovation. Shared Vision and Intra-organizational Knowledge Sharing; It has been found to have a positive effect on Product Development-Oriented Process Innovation. There was no finding that the Open-Mindedness factor had an effect on Product Innovation. Commitment to Learning, Shared Vision and Intra-organizational Knowledge Sharing; It has been found to have a positive effect on Product Innovation.

When the effect of **Knowledge Management on Innovation** is examined; There was no finding that the Knowledge Sharing factor had an effect on Market Oriented Process Innovation. Knowledge Accumulation and Knowledge Utilization; It has been determined that it has a positive effect on Market Oriented Process Innovation. No evidence has been found that the Knowledge Utilization factor has an impact on Product Development Oriented Process Innovation. Knowledge Accumulation and Knowledge Sharing; It has been determined that it has a positive effect on Product Development-Oriented Process Innovation. Knowledge Sharing, Knowledge Accumulation and Knowledge Utilization; It has been found to have a positive effect on Product Innovation.

At this point, organizational learning, knowledge management and innovation meet on a common ground in the axis of “knowledge” and “pragmatism”, and it is of great importance for the future of studies. There is still a lot of study to be done in terms of knowledge management, organizational learning and innovation ecosystem based on Resource Based theory. In addition, examining these relations by conducting similar studies in clusters may be one of the fields of study that are important in terms of global competition. Finally, the literature on artificial intelligence (Paschen, Pitt, & Kietzmann, 2020) in business management is developing rapidly and Knowledge Based Theory-based studies can be done in this field.

The contributions of this paper is presenting new visions of discovery and enlarging the scope of knowledge management, innovation and organization studies.

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