

Artículo de investigación

Effect of Absorption Capacity on Innovative Green Performance with Modular Role of Communication Learning (TOOSAB Consulting Engineers Company)

Effect of Absorption Capacity on Innovative Green Performance with Modular Role of Communication Learning (TOOSAB Consulting Engineers Company)
Efeito da Capacidade de Absorção no Desempenho Verde Inovador com o Papel Modular da Aprendizagem de Comunicação (TOOSAB Consulting Engineers Company)

Recibido: 20 de abril de 2018. Aceptado: 10 de mayo de 2018

Written by:
Azam Amiri¹

¹Expert in ToosAb Consulting Engineers Co, Iran E-mail: Azamamiri2019@gmail.com

Abstract

This research studies the effect of absorption capacity on green performance with the moderating role of communication learning. Data were collected through a questionnaire. The statistical population of the research is the employees of Toosab Company. The sample size was estimated to be 108. To test the hypotheses, structural equation modeling and PLS and spss software were used. In this communication learning study, the role of the main independent variable, the innovative role of green, the role of the main dependent variable and communication learning played the role of modulatory variable. Communication learning includes three dimensions of knowledge sharing, knowledge sharing and knowledge integration, and absorption capacity is considered with two dimensions: potential and real. The results of assumptions showed that absorption capacity has a significant effect on greenhouse effect. Also, results have shown that communication learning has a significant positive effect on green performance and communication learning has a significant moderating effect on the relationship between absorption capacity and inefficient green performance.

Keywords: Innovative Green Performance, Communication Learning, Capacity.

Resumen

Esta investigación estudia el efecto de la capacidad de absorción en el rendimiento ecológico con el papel moderador del aprendizaje de la comunicación. Los datos fueron recogidos a través de un cuestionario. La población estadística de la investigación son los empleados de la empresa Toosab. El tamaño de la muestra se estimó en 108. Para probar las hipótesis, se utilizaron modelos de ecuaciones estructurales y software PLS y spss. En este estudio de aprendizaje de la comunicación, el papel de la principal variable independiente, el rol innovador del verde, el papel de la variable dependiente principal y el aprendizaje de la comunicación desempeñaron el papel de la variable moduladora. El aprendizaje de la comunicación incluye tres dimensiones de intercambio de conocimientos, intercambio de conocimientos e integración de conocimientos, y la capacidad de absorción se considera con dos dimensiones: potencial y real. Los resultados de los supuestos mostraron que la capacidad de absorción tiene un efecto significativo en el efecto invernadero. Además, los resultados han demostrado que el aprendizaje de la comunicación tiene un efecto positivo importante en el rendimiento ecológico y el aprendizaje de la comunicación tiene un efecto moderador significativo en la relación entre la capacidad de absorción y el rendimiento ecológico ineficiente.

Palabras claves: Desempeño ecológico innovador, aprendizaje de la comunicación, capacidad.

Resumo

Esta pesquisa estuda o efeito da capacidade de absorção no desempenho verde com o papel moderador da aprendizagem de comunicação. Os dados foram coletados por meio de um questionário. A população estatística da pesquisa é composta pelos funcionários da Toosab Company. O tamanho da amostra foi estimado em 108. Para testar as hipóteses, modelagem de equações estruturais e software PLS e spss foram utilizados. Neste estudo de aprendizagem em comunicação, o papel da variável independente principal, o papel inovador do verde, o papel da variável dependente principal e a aprendizagem da comunicação desempenharam o papel de variável modulatória. A aprendizagem de comunicação inclui três dimensões de compartilhamento de conhecimento, compartilhamento de conhecimento e integração de conhecimento, e a capacidade de absorção é considerada com duas dimensões: potencial e real. Os resultados das hipóteses mostraram que a capacidade de absorção tem um efeito significativo sobre o efeito estufa. Além disso, os resultados mostraram que o aprendizado da comunicação tem um efeito positivo significativo no desempenho ecológico, e o aprendizado da comunicação tem um efeito moderador significativo na relação entre a capacidade de absorção e o desempenho verde ineficiente.

Palavras-chave: Desempenho Verde Inovador, Aprendizagem de Comunicação, Capacidade

Introduction

In the past two decades, companies and society have increasingly focused on environmental issues and human activities on Earth. For this reason, many companies have made a lot of effort to promote green action, gradual changes in their strategy and practices to address this global environmental concern. The biggest problem facing each organization today is the issue of transformation, and the acceptance of this change by organizations is certainly one of the biggest factors in the survival of the organization. In fact, in this field, whether or not it is a competition, innovations guarantee the survival of any organization. Since today, the environmental performance of enterprises and compliance with environmental laws are considered as a competitive advantage for firms, so the compatibility of any innovation with environmental considerations is very important. Accordingly, a new concept emerged as green innovation, meaning that any innovation should contribute to improving the environmental performance of the organization. In this regard, companies offer innovative products or services, production processes or business methods to reduce environmental damage, pollution (water, air, soil and noise), and other negative effects, which are the main mechanism for reduce or prevent environmental damage, support companies and communities for environmental sustainability. In fact, this may be a prerequisite for achieving competitive advantages, especially when it comes to product innovation and strengthening its survival opportunities, because it can increase the company's productivity by reducing costs, or create new market

opportunities, take advantage of the strategies for differentiating and improving the image of the company (Morant et al., 2018). However, the development of green innovation, also called environmental innovations, is not an easy task, given their characteristics in relation to other innovations, which causes crisis management problems for the company. Those interested in reducing their environmental impacts. As reported by Keynes et al. (2015), such a group of innovations, which includes a high degree of novelty and uncertainty and requires a wide variety of resources; firms often develop new innovations and the knowledge available in the field of industrial knowledge goes further and discovers new sources of foreign knowledge.

Indeed, a large number of collaborative (distinctive) studies have reported stakeholder contributions for the effective introduction of environmental innovations (De Marseille, 2012; Keynley et al., 2015). However, the role of the domestic company's ability to effectively link these knowledge flows to their use of products or services to solve environmental problems is less known. To investigate this gap in literature, this study examines the effect of absorption capacity on innovative green performance with the modular role of communication learning (employees of Toos Water Company). In particular, we focus on the two elements that make up such an internal capability: absorption capacity: as an internal ability to transform knowledge by the stakeholders into new products, services or processes; and communication learning: the ability to share

information and knowledge with supply chain partners.

Theoretical

2-1 Innovative green performance

Green innovation is considered as a new perspective, idea, product, service, or process that seeks to reduce the negative environmental impacts. The goal of green innovation is to reduce the adverse environmental impacts, and this significant factor is raised throughout the value chain from supplier to consumer. Previous researchers identified green innovation as four main dimensions: Green Management Innovation, Green Product Innovation, Process Innovation, and Green Technology Innovation (Morrowy Sharif-Abadi et al., 2014). Green Management Innovation refers to the organization's ability to develop and implement green projects such as green supply chain management and environmental management systems. One of the steps that the organization can take to achieve this after green innovation can be the successful implementation of a series of ISO 14000 standards, saving on resource consumption, preventing the release of harmful substances in the environment, conducting seminars aimed at educating and promoting stakeholder awareness. Green product innovation involves improving quality and product diversity simultaneously with regard to environmental considerations. The European Union Commission (2001) defines green product innovation as the design and development of products that reduce the negative environmental and environmental impacts of a product, uses less resources to produce the product, and waste disposal phase is prevented from waste production. Process innovation is defined as improving existing processes and developing new processes aimed at reducing uncertainty and increasing the productivity and efficiency of intra-organizational processes. The use of green knowledge to advance and direct innovation in organizational processes is called process innovation, which can increase and improve the environmental performance of the organization. To this end, it is imperative that the managers of the organization, in addition to evaluating and improving processes such as recycling, reuse and re-production of raw materials, use the solutions that reduce the consumption of energy and environmental pollutants during production, withdrawals of the product which will have full knowledge. Green Technology Innovation

involves investing in the provision of green equipment and machinery and the use of advanced green technologies. Also, the development of new solutions for preserving goods, saving materials consumption and document management are also in the category of green technology innovation. Basically, green technology innovation is the process of producing technical know-how aimed at reducing negative environmental impacts (the same source). Today, companies tend to strive to increase green innovation. Green innovation, therefore, is an important tool that can help companies and the community to maintain environmental sustainability and play an important role in companies that are willing to face the challenges of green and environmental awareness. It also has the competitive advantage and business performance (Morant et al., 2018).

2-2 Communication learning

Selens and Sally (2003) define the concept of communication learning as "a collaborative activity in which the two parties try to create more value together, individually or collectively". Chang et al. (2011) pointed out that communicative learning is "a collaborative activity between a supplier and a buyer, in which the parties share information, which is mutually interpreted and linked to a specific memory with a domain that may change the behavior of a particular potential relationship. "Other studies state that communication learning is a joint activity between an organization and one or more sectors (supplier, customer, partner, etc.) whose purpose is the exchange of information (Lial Rodriguez et al., 2014). Communication learning is a multi-dimensional structure that is interested in three structures, information sharing, information exchange between a company and one or more participants; sharing, developing knowledge, insight and communication between past actions, the effectiveness of these actions, and future actions; and the integration of knowledge, a combination of co-ordination (coordination of interests) and coordination (coordination of actions) between companies and departments is formed (Morant et al., 2018).

These three variables define a general framework that forms the basis for the exchange of knowledge between the sender and the receiver (Lial Rodriguez et al., 2014). The ability to participate in the promotion and use of communication learning mechanisms leads to a

competitive strategy that may lead to competitive advantages and increased business performance. Through communication learning, strategic goals such as risk distribution and outsourcing of some functions in the value chain can also be achieved. Creating and launching collaborative networks which is between companies and stakeholders in major innovation development processes. Therefore, companies can create strategic unions, joint ventures, inter-company networks, research and development consortia, benchmark experiences and other partnerships to learn their best practices. (Morant et al., 2018).

2-2-1 Sharing knowledge

Knowledge sharing is the activity of transferring and distributing knowledge from a person, group or organization to another person or group. Through effective knowledge sharing, organizations can improve their performance and reduce educational costs and risks associated with uncertainty (Hadizadeh Moghadam et al., 2012). Organizations can share knowledge in a variety of ways. Among these mechanisms, we can refer to the mechanisms presented in the Dixon model. He proposes five mechanisms for knowledge sharing, including sequencing knowledge sharing, explicit knowledge sharing, hidden knowledge sharing, strategic knowledge sharing, and the sharing of expert knowledge (the same source). The sequencing of knowledge sharing occurs when a similar group of knowledge workers performs the same task once again by applying their knowledge. The obvious sharing of knowledge occurs when the experience of a team of knowledge workers is used to perform the same activity in another team. Hidden knowledge sharing occurs when a group of knowledge workers do the same work by using other group knowledge in another context. The sharing of strategic knowledge occurs when a group takes on the responsibility of something that is rarely happening or takes an exceptional project and wants to use the experience of others within an organization that performs the same work. Knowledge sharing takes place when public knowledge is transmitted from an expert resource inside or outside the organization to empower the group to solve new problems with new methods and knowledge (Dixon, 2000). According to the Dixon model, maintaining a balance between the two activities of knowledge 1. Creating knowledge and 2. Transferring knowledge throughout the organization is an important issue

that organizations must pay attention to. Accordingly, in the Dixon model, according to a systematic approach to building a knowledge transfer system, five important mechanisms for knowledge sharing are expressed by exchanging and sharing tacit and explicit knowledge with other individuals, their capacity to deal with situations And new problems are rising and helping to create new solutions for advanced problems. In this case, sharing knowledge and diversifying it to create new knowledge and innovation is necessary (Hadizadeh Moghadam et al., 2012).

2-2-2 Sharing

Sharing or transferring knowledge through a variety of channels are such as discussion, conference, formal and informal networks, and databases, aiming at expanding value and creating synergistic knowledge. Knowledge sharing is a process that involves gaining experience from other people. Hence, "knowledge transfer" is also called the learning of an organization. In each organization, personal knowledge should be shared with other employees' knowledge. Hence, it is said that knowledge transfer occurs at the right time, in the right place and in suitable individuals (Jabbari and Mehdoshi, 2014). To deploy and promote the knowledge sharing process effectively, three scientists have presented two distinct strategies, namely, the "encryption" strategy and the "personalization" strategy. The encryption strategy addresses the hardware dimension of knowledge sharing and, based on this, knowledge can be separated from its source and stored in databases. This can facilitate the transfer of knowledge among members of the organization.

The prerequisite for successful implementation of this strategy is the availability of advanced computer systems and other hardware. On the other hand, the personalization strategy is based on the assumption that knowledge can be shared through face-to-face social interaction (direct or through mass media) (Sogni et al., 2011). Many thinkers believe that the contribution of each of these two strategies to advance the knowledge sharing process is superior to the strategy of personalization, which is far superior to the encryption strategy; because knowledge sparks are first created in the minds of members of the organization and then transcended through social interactions among the members of the organization, thus giving them the opportunity to grow and eventually flourish. It can therefore be

concluded that the subject of sharing knowledge is rooted in organizational culture, rather than being reliant on organizational technology, a culture that can encourage or undermine the sharing of knowledge (the same source).

2-2-3 Integration of knowledge

Knowledge is an intangible strategic asset that can enhance the competitiveness of companies. Therefore, business executives try to use this asset to create value higher than competitors in various ways. Knowledge is defined as the ability of each individual to develop and process information about one's environment. In the literature of knowledge, it is divided into two types: the first type is tacit knowledge that is non-imitative, valuable, practical, and resident in the minds of employees. The second type is explicit knowledge that is publishable, manipulated, recorded and stored. Creating new knowledge involves a permanent and repeated process of evaluation, search, interpretation, and integration. It goes beyond producing new ideas or examining new ways to do things; in this process, people need to evaluate existing knowledge and discover new knowledge needs, a program to create this knowledge, shape new requirements and ultimately combine the new knowledge with the prior knowledge and firm patterns of the organization. Organizational knowledge is created by transforming this kind of knowledge into other forms of knowledge that are valuable, non-imitable and non-transferable to other companies. The ability to integrate knowledge can be defined as the ability of individuals to retrieve and integrate information that has been exchanged in the organization. The transfer and integration of knowledge is defined as the process through which one unit is influenced by another experience (Grossi Mokhtarzade et al., 2016).

Transferring, collecting and integrating knowledge and experience from individuals leads to the creation of organized knowledge collections that remain in the organization and used for others. The integration of knowledge is the process of implicitly and explicitly transferring knowledge across organizational boundaries that is shared with individuals and groups, and knowledge gained to solve problems (Shah Mohammadi and Bordbar, 2016). However, the ability to combine and integrate knowledge is primarily related to the ability of

individuals to absorb and integrate information. The ability to integrate knowledge is one of the keys to developing the innovation capability in an organization, as it improves the activities of creating and developing company products and processes (Gutta Mokhtarzade et al., 2016).

2-3 Recruitment Capacity (Potential and True)

Recruitment Capacity refers to the ability to use existing knowledge in order to focus on the value of new information, to attract and apply it to create new capabilities and knowledge. Also, Recruitment capacity is considered to be the ability of the company to deal with the implicit knowledge portions of the company (Khadamoradi and Khalili, 2013). The Recruitment capacity was first developed by Cohen and Levinthal in 1989 and developed in 1990. They are defined from Recruitment capacity to the ability of an enterprise to identify the value of new external information, to attract it and use it for commercial purposes. The conception of Recruitment capacity is done by researchers in a variety of ways, often including absorption capacity of two, three or four fundamental structures. The definition of the most references to this day has been presented by Zahra and George in 2002 with four structures (Busheeri et al., 2016). This definition provides a model that shows recruitment capacity consists of four processes of acquisition, recruitment, deformation and utilization. These four processes are also classified at a higher level in the two categories of potential recruitment capacity and realized recruitment capacity (Zahra and George, 2002).

The potential recruitment capacity includes acquisition (the ability of an enterprise to identify and acquire knowledge that is out of the organization and is critical to the organization's operations) and the recruitment (routines and processes of an enterprise that allows it to analyze, process, interpret, and understand information) obtained from external sources). Zahra and George state that although potential recruitment capacity makes a firm ready to acquire foreign knowledge, it does not guarantee its exploitation. Utilization needs to have an recruitment capacity. Realized recruitment capacity also includes deformation (the company's ability to develop and refine work routines that facilitates the combination of existing knowledge and new knowledge acquired and recruitment) and utilization (the ability of the

firm to develop competence Existing ones, or creation of new competencies by using knowledge transformed into ongoing firm operations). Zahra and George (2002) showed that firms that have research and development collaborations and market-oriented interactions in research are more capable of capturing potential in the first dimension. They also showed that recruitment capacity is a path dependent phenomenon, and firms that have been involved in research and development activities in the past will have a higher recruitment capacity. Firms with more potential recruitment capacity will have a larger share of new or improved market products (Phosphorus and Tribune, 2008).

Relationship of Innovate Green Capacity and Performance

Recruitment capacity is an important part of the company's ability to create new knowledge, which helps companies identify the foreign knowledge that develops new products / services and new ideas. It distinguishes the company from its competitors and gives companies a potential benefit in terms of acquiring knowledge (Morant et al., 2018). Lial Rodriguez et al. (2013) evaluated the relationship between absorption capacity and innovation and showed that the results of innovation were largely the result of the effort and investment of knowledge in the enterprise. Considering the characteristics of environmental innovations, absorption capacity is effective for their development. Glashash et al. (2009) showed that absorption capacity as an organizational ability may increase the performance of green innovation. Through these processes, a company may learn to deal with environmental problems. In fact, green innovation practices involve managing a large amount of internal and external knowledge, often from different fields.

The recently acquired foreign knowledge should be adapted to previous knowledge of internal knowledge and eventually be exchanged (Hashem et al., 2015). Several studies have examined the relationship between greenhouse gas absorption capacity and innovation (Glasch et al., 2009; Hashem et al., 2015), the meaning is widespread acceptance and expansion of green innovation (ie, the development of electric motors, hybrid vehicles and vehicles on hydrogen; sustainable tires that reduce friction and fuel economy; and the use of plant fiber in composite materials) requires continuous

management that actively promotes an organizational culture relying on knowledge and innovation.

Communication Learning and Innovative Green Performance

Strengthening strong relationships and business partnerships with the distinct shareholders of companies can lead to value creation for both sectors and increase their competitive advantage. For this reason, companies need to allocate time and resources to build and collaborate with partners, which in turn has a two-way value, with both primary stakeholders (customers, suppliers, employees, investors and communities) and secondary (government, rivals, media, special interests and consumer advocacy groups) (Morant et al., 2018). Similarly, Ashok et al. (2016) defined cooperation as a joint production of value by a company and its main partners, which includes the exchange, sharing and development of cooperation, and show that investment in knowledge management practices hence it is essential for the valuation of foreign knowledge in process development. Maintaining a context for learning communication may lead companies to adapt and capture all valuable communication-based knowledge. Creating collaborative networks between companies and stakeholders is the basis of the development of innovation processes.

According to Huang and Rice (2012), the promotion of product and process innovation offers significant benefits that are essentially worthwhile with the benefits of collaboration (ie, a more fluid transfer of experience and complementary expertise and resources between components, the development of knowledge base deeper and wider than companies, access to foreign specialized knowledge that companies may need to overcome existing technological deficiencies and share risks, research costs and rewards in colleagues). Therefore, those companies that are actively participating in partnerships may be able to successfully innovate by sharing resources and complementary capabilities (Morant et al., 2018). This view is also supported by Ashok et al. (2016); empirical results from a sample of 166 knowledge-based companies show that collaborating with end-users will help the innovation process. According to resource dependency theory, organizations create cooperative relationships to respond to

uncertainty and, consequently, the ability to organize their resources. Therefore, companies should facilitate the exchange of information with customers and suppliers in order to increase their knowledge, skills and competition through customer learning mechanisms and update their behavior on the basis of it. Due to the complexity of the process, relationships may vary based on the ability to learn individual segments. Therefore, communication learning may be related to the field of green innovation, which is characterized by a high level of complexity and uncertainty and in collaboration with external partners (Morant et al., 2018).

Previous research shows a positive and significant relationship between the development of cooperation and the sharing of knowledge among employees and the establishment of an active environmental strategy in organizations (Argan Corria et al., 2013). Di Marseille et al. (2012) states that research and development cooperation with suppliers will promote more environmental innovations than other innovations.

Literature review and conceptual model of research

In a study titled "The Effect of Green Enterprise Identity on Innovative Performance of Green Workers at Oil Company Abadan Oil Company" was found that green corporate identity is effective on green innovation, environmental commitment, and the development of legitimacy and legislation Kamkar and Taheri Goodarzi (2016). Also, environmental commitment and the development of legitimacy and legislation affect the performance of green innovation. In a study (Case Study: Drug Producer Enterprises in Iran) by Grossi Mokhtarzadeh et al. (2016) examined the impact of knowledge integration capabilities on technological innovation and strategic performance. Data analysis showed that the ability to integrate knowledge has a direct and significant effect on the ability of technological innovations as well as strategic performance of the firm. The research findings also showed that the ability to innovate the product significantly influences the relationship between the ability to process innovation and the firm's strategic performance. Busheeri et al. (2016) conducted a research on the role of absorption capacity in promoting the two sources of innovation (exploratory and exploitative). The results showed that the realized absorption capacity was the pre-

requisite of exploratory and operational innovation and also the potential absorption capacity in the relationship between realized absorption capacity and exploratory innovation and the positive role of moderating and the relationship between realized absorption capacity and profit innovation in hypothesis has a negative moderating role.

Moravoty Sharif Abadi (2014) examined the impact of green innovation on the performance of the organization. The results indicate that the dimensions of green innovation, including process innovation and green technology, both directly and indirectly affect the performance of the organization through the mediating role of environmental performance. Also, management innovation and green products only indirectly affect the organization's performance. Jabbari and Mehdoshi (2014) identified the factors affecting behavior on knowledge sharing among faculty members of the universities of Gorgan. The statistical population of this study was faculty members of Islamic Azad University, Medical Sciences and Agriculture and Natural Resources of Gorgan. First, the data were collected through deep and semi-structured interviews and Strauss and Corbin were compared. To this end, 23 faculty members of Gorgan universities were selected through purposeful sampling and snowball method. Finally, after reviewing 427 open source, the findings were presented in the form of a paradigm in which the central core of it was the factors for knowledge sharing among the faculty members of the universities and included four categories of emotional-social linkages, Market value, achievement of individual growth and promotion, and compliance with requirements. The results of Morant et al. (2018) suggest that recruitment capacity and communication learning have a positive effect on green innovation performance and communication learning can reduce the relationship between recruitment capacity and green innovation performance. Ritala and Hermelina (2013) found that recruitment capacity is associated with incremental innovation, as competing firms constantly change their existing knowledge in order to gradually improve their products and technologies. Tang Qing et al. (2012) found in the research entitled The Role of Interaction on Knowledge Sharing that reciprocity is one of the positive values of sharing knowledge. In the research, Hermelina et al. (2012) also examined the effect of recruitment capacity as an independent variable on the success of alliances and the performance

of innovation as dependent variables and the results indicate the relationship between these variables. Based on the aforementioned theoretical literature, the conceptual model of the research is presented in Fig1. This model is

based on the Moranet et al. (2018) research model. The effect of recruitment capacity on the innovative performance of green with the moderating role of communication learning has been investigated

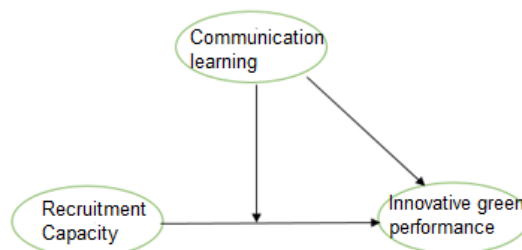


Figure 1. Conceptual model of research (Morant et al., 2018)

Hypothesis

- Absorption capacity has a significant effect on greenhouse effect
- Communication learning has a significant effect on green performance

Communication learning has a significant moderating effect on the relationship between absorption capacity and innovative green performance.

Research methodology

The present research is applied in terms of purpose and in terms of collecting data for testing hypotheses is descriptive-analytic type and correlation branch. The statistical population of this research is the employees of Water Tous Co. in Iran. Simple sampling method was used for sampling. In terms of the population size of 245 people, sample size was determined at the error level of 5% using Krejcie and Morgan tables of 150 people. After collecting data using standard questionnaire (Morant et al., 2018), structural equation modeling was used to test the hypotheses and PLS and SPSS software were used. Validity and reliability were investigated using confirmatory factor analysis.

Findings

5-1 Descriptive statistics:

The profile of the respondents in this study was examined using five demographic variables: age,

gender, education level, marital status, merely for reporting the subjects' characteristics. The following table summarizes these results. According to the results, the number of men (61.3%) was higher than that of women (38.7%), the prevalent age group was from 30 to 26 years old (46.7%) and those with a bachelor's degree (42.7%) had the largest share in the sample. Most respondents (56.7%) were married.

5-2 inferential statistics

To analyze the data of the questionnaire, the structural equation modeling technique with partial least squares (PLS-SEM) and Smart PLS software was used. Structural equations modeling consists of two parts of the model of measurement and the variables of the model are classified into hidden and explicit categories, which are used by hidden variables at different levels. To assess the validity and reliability of the questionnaire, partial least squares method was used. In this method, reliability is measured through three criteria: 1. Factor load factor, 2. Cronbach's alpha, 3. Combined reliability (CR). It is worth noting that for factor load estimation, the factor loads of all items are higher than 0.4. The results of the two other criteria, the reliability of the questionnaire, namely Cronbach's alpha, and the combined reliability which should be more than 0.7 for each structure, are also presented in Table 2 and the acceptable reliability of the dimensions is evident.

Table 1. Results of the research

Load capacity	question	Load capacity	question	Load capacity	question
0.726	Q1	0.843	Q15	0.813	Q29
0.792	Q2	0.904	Q16	0.896	Q30
0.810	Q3	0.883	Q17	0.815	Q31
0.825	Q4	0.669	Q18	0.875	Q32
0.759	Q5	0.763	Q19	0.878	Q33
0.805	Q6	0.828	Q20	0.868	Q34
0.762	Q7	0.813	Q21	0.895	Q35
0.790	Q8	0.776	Q22	0.830	Q36
0.778	Q9	0.848	Q23	0.807	Q37
0.881	Q10	0.819	Q24	0.843	Q38
0.887	Q11	0.789	Q25	0.847	Q39
0.759	Q12	0.805	Q26	0.755	Q40
0.820	Q13	0.799	Q27		
0.695	Q14	0.790	Q28		

Table 2. Results of the reliability of research items

component	Combined reliability	Cronbach's alpha
Knowledge sharing	0.889	0.830
Sharing knowledge	0.916	0.889
recruitment capacity	0.963	0.959
Capacity of potential recruitment	0.951	0.940
Actual recruitment capacity	0.942	0.930
Green innovative function	0.927	0.910
Communication learning	0.947	0.939
Knowledge integration	0.919	0.894

The validity of the questionnaire was verified by means of convergent validity and using partial least squares method. Convergent validity reflects the ability of indicators of one dimension in explaining that dimension. Convergent validity

is checked through the mean value of the extracted variance. If this criterion is greater than 0.4, the convergent validity of the measuring instrument is confirmed. According to Table 3,

all the values of the convergent validity of the questionnaire are shown.

Table 3. Convergent Validity Results of Research Variables

component	Convergent Validity
Knowledge sharing	0.669
Sharing knowledge	0.647
recruitment capacity	0.621
Capacity of potential recruitment	0.708
Actual recruitment capacity	0.672
Green innovative function	0.615
Communication learning	0.528
Knowledge integration	0.653

Test results of hypotheses

The T-Student statistic has been used to confirm or reject the research hypotheses. If the value of the t statistic is greater than $\pm 96/1$, the corresponding hypothesis is rejected at an error level of 0.05.

First hypothesis: absorption capacity has a significant effect on greenhouse effect.

According to Table 4, assuming the T-value out of the $96/1 \pm$ is the cause in 95%, so H0 is rejected and hypothesis H1 is accepted, the capacity to absorb the innovative performance green sample has an effect. Also, the effect of absorption capacity on greenhouse gas performance is 208% and its direction is positive and incremental.

Second hypothesis: Communication learning has a significant effect on green performance.

According to Table 4, assuming the T-value out of the $96/1 \pm$ is the cause in 95%, so H0 is rejected and hypothesis H1 is accepted that communicative learning on innovative performance green sample has an effect. Also, the effect of communication learning on the green performance is 0.701 and its direction is positive and incremental.

Hypothesis 3: Communication learning has a significant moderating effect on the relationship between absorption capacity and innovative green performance.

According to Table 4, assuming the T-value out of the $96/1 \pm$ is the cause in 95%, so H0 is rejected and hypothesis H1 is accepted, the relationship between capacity absorption on the green performance in this sample has a moderating effect.

Table 5. Results from the research hypotheses test

Results	T Statistics (O/STDEV)	Original Sample (O)	
Confirm	3.710	0.208	Green innovative function <- recruitment capacity
Confirm	12.973	0.701	Green innovative function <- Communication learning
Confirm	2.433	0.074	Moderating Effect I -> Green innovative function

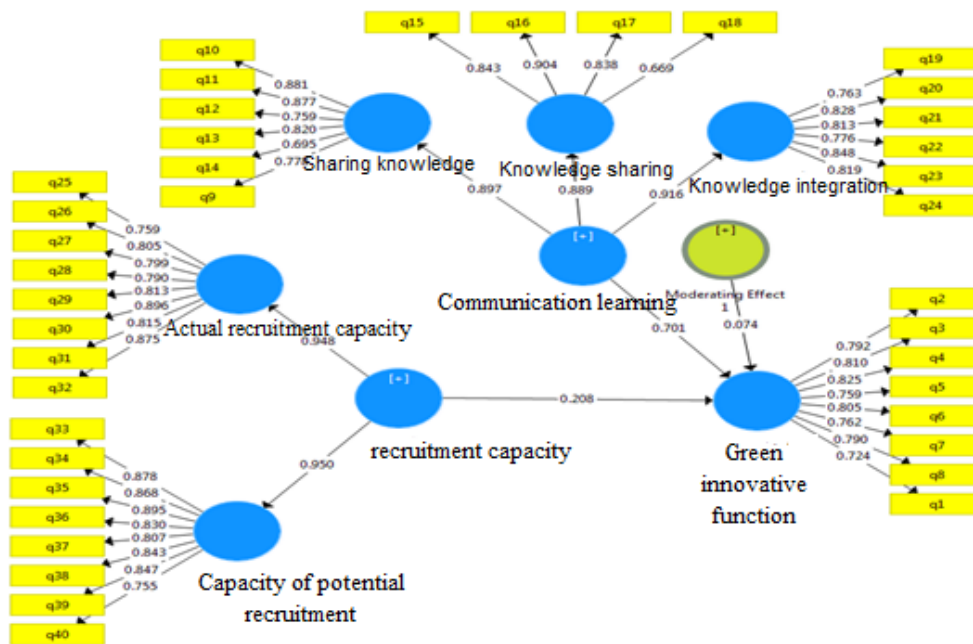


Figure 2. Research model in standard estimation mode

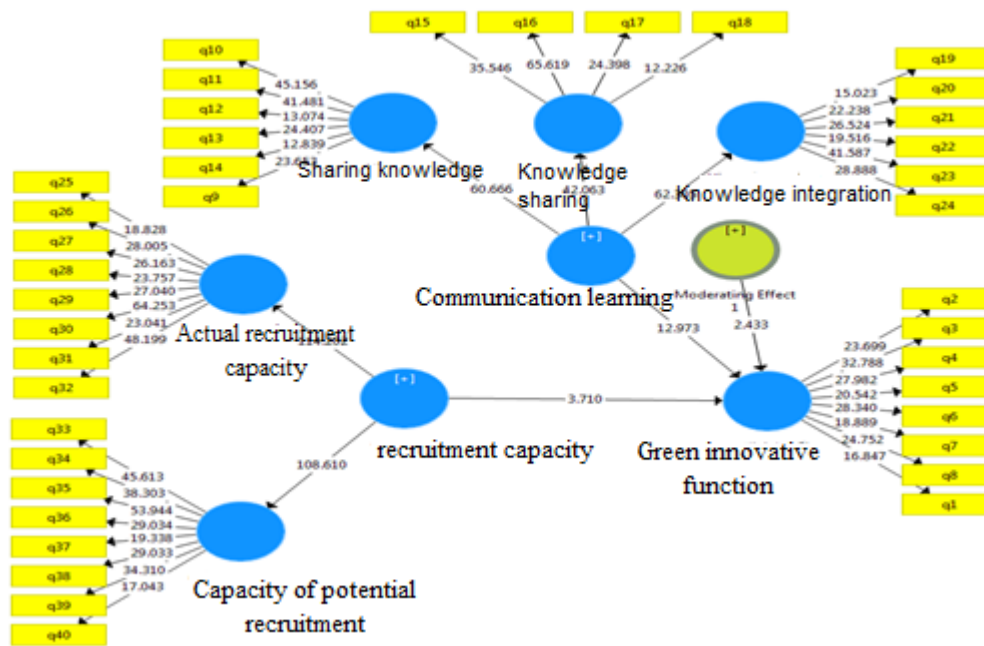


Figure 3. Research model in the meaningful state of the parameters

Conclusion

Innovative green performance in the organization is one of the most important factors. Many factors can have an impact on innovative performance and affect the continuous creation and growth. In this study, we investigated the effect of absorption capacity on the innovative green performance with the modular role of communication learning (employees of Toos Water Company). The results of assumptions showed that absorption capacity has a significant effect on greenhouse effect. Also, results have shown that communication learning has a significant positive effect on green performance and communication learning has a significant moderating effect on the relationship between absorption capacity and inefficient green performance. According to the findings of this study, as in most cases, it is clear that Green Alternative approaches are being supported as a way of maintaining competitive advantage, meeting the requirements of external stakeholders, improving the image or reputation of a company, or distinguishing from competitors. But in general, the results of this study indicate that the potential of each company to improve its innovative green performance depends on its ability to develop and enhance knowledge-based assets through increased organizational capabilities such as communication learning and absorption capacity. Therefore, with regard to these results, it is

suggested to managers that different types of abilities for the creation and growth of innovative green performance should be analyzed, communication learning and absorption capacity along with their constituent institutions should be taken into account jointly. To fully enhance the innovative ability and performance of the organization in the organization. In fact, the constituents of communication learning, which include knowledge sharing, knowledge sharing and knowledge integration, also play a direct role in improving innovative green performance. Also, absorption capacities, including potential absorption capacities, can also be directly affected by the role of modular communication learning in creating and enhancing greenhouse gains. In fact, in order to manage and organize the innovative green performance in companies, it is necessary to consider the dimensions of absorption capacity and communication learning dimensions.

References

- Aragón-Correa, J.A., Martín-Tapia, I. and Hurtado-Torres, N. (2013), "Proactive environmental strategies and employee inclusion: the positive effects of information sharing and promoting collaboration and the influence of uncertainty", *Organization & Environment*, Vol. 26 No. 2, pp. 139-161.
- Ashok, M., Narula, R. and Martinez-Noya, A. (2016), "How do collaboration and investments

- in knowledge management affect process innovation in services?", *Journal of Knowledge Management*, Vol. 20 No. 5, pp. 1004-1024.
- Bushehri, A. Bagheri, A. Taba'iyán, Kumal. Namwar, Kaveh (2016), the role of recruitment capacity in promoting two sources of innovation (Exploration and Utilization), *Quarterly Journal of Technology Development Management*, Volume 3, Number 4.
- Cainelli, G., De Marchi, V. and Grandinetti, R. (2015), "Does the development of environmental innovation require different resources? Evidence from Spanish manufacturing firms", *Journal of Cleaner Production*, Vol. 94, pp. 211-220.
- Cheung, M.S., Myers, M.B. and Mentzer, J.T. (2011), "The value of relational learning in global buyersupplier exchanges: a dyadic perspective and test of the pie-sharing premise", *Strategic Management Journal*, Vol. 32 No. 10, pp. 1061-1082.
- De Marchi, V. (2012), "Environmental innovation and R&D cooperation: empirical evidence from Spanish manufacturing firms", *Research Policy*, Vol. 41 No. 3, pp. 614-623.
- Dixon Nancy M.;" Common knowledge: How companies thrive by sharing what they know"; Harvard Business School Press;2000, Available From :<URL: <http://www.gigapedia.com>>.
- Fosfuri, A. & Tribo, J., 2008. Exploring the antecedents of potential absorptive capacity and its impact on innovation performance. *Omega*, Volume 36, pp. 173-187.
- Gema Albort-Morant, Antonio L. Leal-Rodríguez, Valentina De Marchi, (2018) "Absorptive capacity and relationship learning mechanisms as complementary drivers of green innovation performance", *Journal of Knowledge Management*, <https://doi.org/10.1108/JKM-07-2017-0310>
- Gluch, P., Gustafsson, M. and Thuvander, L. (2009), "An absorptive capacity model for green innovation and performance in the construction industry", *Construction Management and Economics*, Vol. 27No. 5, pp. 451-464.
- Gurney Mokhtarzadeh, N. Mahmood Gostasbi, M (2015), the Impact of Knowledge Integration Capacity on Technological Innovation and Strategic Performance (Case Study: Drug Producer Enterprises in Iran), *Innovation and Value Creation Schedule*, Year 5, Number 10.
- Hadizadeh Moghaddam, A, Ramin Mehr, Hamid. Heidari, H. (2010), presentation of a model for knowledge management success, the perspective of public administration, No. 4, pp. 83-100.
- Hashim, R., Bock, A.J. and Cooper, S. (2015), "The relationship between absorptive capacity and green innovation", *World Academy of Science, Engineering and Technology, International Journal of Social, Behavioral, Educational, Economic, Business and Industrial Engineering*, Vol. 9 No 4, pp. 1049-1056.
- Huang, F. and Rice, J. (2012), "Openness in product and process innovation", *International Journal of Innovation Management*, Vol. 16 No. 4, pp. 1-24.
- Hurmelinna-Laukkanen, P., Olander, H., Blomqvist, K. & Panfilii, V., 2012. Orchestrating R&D networks: Absorptive capacity, network stability and innovation appropriability. *European Management Journal*, Volume 30, pp. 552-563.
- Jabari, N. Mehedoushi, M (2014), Identifying the Effective Factors on Behavior by Knowledge Sharing Among Faculty Members of Gorgan Universities, *Quarterly Journal of Research and Planning in Higher Education*, Volume 20, Number 3, p. 45-65.
- Kamkar, S. Taheri Goodarzi, Hojjat (2015), The Effect of Green Enterprise Identity on Innovative Performance of Green Workers at Abadan Oil Refining Company, *Third International Conference on New Research in Management, Economics and Humanities*.
- Leal-Rodríguez, A.L., Roldán, J.L., Ariza-Montes, J.A. and Leal-Milla'n, A. (2014), "From potential absorptive capacity to innovation outcomes in project teams: the conditional moderating role of the realized absorptive capacity in a relational learning context", *International Journal of Project Management*, Vol. 32No. 6, pp. 894-907.
- Leal-Rodríguez, A.L., Roldán, J.L., Leal, A.G. and Ortega-Gutiérrez, J. (2013), "Knowledge management, relational learning, and the effectiveness of innovation outcomes", *The Service Industries Journal*, Vol. 33 Nos 13/14, pp. 1294-1311.
- Marvoty Sharif-Abadi, Ali. Mahsa. Ziaei Aladdin, A (2014), The Effect of Green Innovation Dimensions on Organizational Performance, *Journal of Industrial Management Studies*, Vol. 12, No. 33.
- Mohammad, E. Ghazanfari, Seyyed Mohammad Javad. Aslani, (2010), Identifying and Measuring Key Success Factors in the Knowledge Sharing Process, *Quarterly Journal of Defense Strategy*, Vol. 9, No. 35 .Ritala, P. & Hurmelinna-Laukkanen, P., 2013. Incremental and radical innovation in cooperation- the role of absorptive capacity and appropriability. *Product*

Development & Management Association, 30(1), pp. 154-169.

Selnes, F. and Sallis, J. (2003), "Promoting relationship learning", *Journal of Marketing*, Vol. 67 No. 3, pp. 80-95.

Shah Mohammadi M, Bordbar, GH (2016), Presentation of the Effect of Transfer and Integration of Knowledge on Human Resources Resilience, *Quarterly Journal of Human Resource Management Researches*, Imam Hossein

University of Medical Sciences, Eighth, No. 1, pp. 237-260.

Tung-Ching, L., Sheng, W., & Chun-Tai, L. (2012). Exploring the affect factors of knowledge sharing. *Behavior Quarterly*, 29(1),35-57. ior: The relations model theory perspective. *Expert Systems with Applications*, 39, 751–764.

Zahra, S. A., & George, G. (2002). Absorptive Capacity: A Review, Reconceptualization, And Extension. *Academy of Management Review*, (27:2), 185-203