

Working from Home: Creativity and Innovation in the High-Tech Industry in Israel

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Abstract: Creativity is a crucial aspect of tech management, as it allows hi-tech workers to identify and solve problems, generate new ideas, and create innovative solutions that meet the needs and desires of consumers. The COVID-19 pandemic has had a significant impact on the way that people work, with many companies shifting to remote work as a means of maintaining business continuity. This shift has led to a debate about the impact of remote work on creativity, with some arguing that working from home increases creativity since it allows for more flexibility and autonomy. In contrast, others say it decreases it since it can lead to isolation and a lack of collaboration. While some evidence suggests that working from home may positively impact creativity, there is also evidence to suggest that it may have a negative impact. The main objective of this study is to investigate differences, if any, in the perceived creativity among hi-tech workers working from home or the office. The study provides a more nuanced understanding of hi-tech workers' attitudes toward creativity, innovation, and related risk-related issues. We used a validated questionnaire about the extent of innovation and creativity of people in general. Then we investigated these characteristics with the extent of working from home or the office. We statistically compared the means of variables of interest for categories of interest of respondents. We found no significant difference between high-tech workers working from home or the office. Yet, we discovered that hi-tech workers working from home reveal more resilience toward creative ways to solve problems even though these ways are associated with more risk. They are willing to take more risks to accomplish assignments innovatively and creatively. We also found that managers and development hi-tech workers tend to work from home.

Keywords: perceived creativity, working from home, creativity to handle risk, creativity for better quality

1. Introduction

1.1 Rationale

The Corona epidemic (Covid-19) has significantly impacted how people work, with many companies moving to a remote work model to maintain business continuity (Community & England, 2020). If so, a fundamental issue arises as to what is the effect of working from home on the degree of creativity and innovation among employees in general and managers and whether there are differences in the degree of creativity and innovation at work between workers from home and employees who are in organizations. Few studies have dealt with the relationship between the degree of creativity and innovation and the workplace - from home to the organization.

Organizations must respond quickly and flexibly to the changes and opportunities that the environment creates among them. Organizational innovation and creativity have become a tool in the hands of organizations to preserve and nurture the organization's ability to deal with its competitors in a changing environment. This confrontation creates an existential need among organizations to expand organization's activities and ensure renewal (Singh et al., 2021).

The present study examines the differences between high-tech managers who work from home and those who work in the office in their level of creativity and innovation. It will also examine the relationship between working hours from home and creativity and innovation among high-tech managers.

Our research question is to what extent there are relationships between working from home or the office and hi-tech workers' perceived level of creativity and innovation. The research confronts an interesting and vital issue about the pros and cons of working from home versus the office, as working from home has become essential for many workers in high-tech organizations worldwide.

1.2 Literature review

The rapid spread of COVID-19 exposed us to the alternative of working from home. Studies show that the corona crisis has economic, psychological, and mental consequences (Sahu, 2020). As part of the quarantine policy, work and employment were affected when employees were required to work from home and not come to their organization. Some organizations choose to continue with this format even after the spread of the virus has been fully or partially stopped (Condon, 2021). The work-from-home model has many advantages and disadvantages

for both the employer and the employee, which need to be recognized to deal with them most efficiently and correctly for the benefit of both parties (Condon, 2021).

Accordingly, the research of Hayes and others (Hayes et al., 2020) indicates that following the Corona crisis, organizations have internalized that the world of work has changed and will not return to its previous format and, therefore, many organizations have adopted work models that incorporate work from home and constitute the norm the new. However, the transition to a different work model requires planning, change management and even adjustment of processes, metrics, and systems.

Creativity describes a process of generating ideas, uses, and original ways of solving problems by an individual or group working together. Creativity was related to several organizational factors and several cognitive and psychological structures. Psychological and cognitive factors related to creativity are flexibility, persistence, adaptability, enthusiasm, and motivation (Comunian & England, 2020).

Concerning the effect of working from home on the degree of creativity of employees, the studies indicate mixed findings; for example, the study by Zhou and George (2021), which examined the degree of creativity of workers from China and Germany following the spread of the Coronavirus (Covid-19) - before and after the quarantine policy. The study was conducted using the quantitative method and included 754 employees. The study's findings showed an increase in day-to-day creativity among workers from China and Germany - after the transition to working from home and the entrenchment of the lockdown created by the spread of the coronavirus.

In the article by Fūzi and others (Fūzi et al., 2022), the researchers explain how innovation and creativity are the key elements in the conduct of organizations in the 21st century. The researchers claim that creating collaborative, flexible, open, and comfortable workspaces contribute to an increase in the level of creativity and innovation of employees. As part of the article, the researchers review studies that lead to the claim that employees staying in open spaces at work contributes to the level of creativity and innovation among them.

1.3 Research Hypothesis

Compared to creativity, innovation is the application of ideas relating to products, processes, and ways of working that will contribute to the success of the organization, the team, and the individual. Innovation changes the organization as a response to changes in the external environment or as a proactive action to influence the environment. Therefore, innovation is the adoption of ideas or behavior in various fields that relate to a system, policy, program, product, or service that is new to the organization (Singh et al., 2021). The role of risk attitude and innovations has also been explored. Sadeh et al. (2022) show how risk mitigation helps confront innovative uncertainty to get better performance. These have led us to our first research hypothesis.

RH1: People that work from the office have more perceived creativity.

Creativity describes a process of generating ideas, uses, and original ways of solving problems by an individual or group working together. Creativity was related to several organizational factors and several cognitive and psychological structures. Thus, organizational factors found to be related to the invention are: (i) Expressing appreciation for innovation, (ii) Encouragement for taking risks and creating ideas. (iii) The reward for creative thinking. (iv) Heterogeneous group work and commitment to the project.

Psychological and cognitive factors related to creativity are flexibility, persistence, adaptability, enthusiasm, and motivation (Comunian & England, 2020 So we define our second research hypothesis.

RH2: People that work from the office are ready to take more risks to accomplish their assignments.

Many studies discussed the quality issues of the jobs done by high-tech workers and managers, e.g., Sadeh and Feniser (2021). They related it to communication among the workers. Therefore, we raise the third research hypothesis about the concern of quality.

RH3: People that work from the office are more creative about the quality of their tasks.

2. Methodology

The research approach is quantitative and based on a questionnaire distributed among hi-tech workers in Israel. There are three major categories of questions. The first part contains questions about the background of the responders, their gender, education, their jobs, marital status, age, and tasks. The second part deals with the intensity of working hours from home and from the office in 2022. While the impact of COVID-19 sharply decreased. Most, if only some, of the working places, were not regulated to work from home. The third part

includes six questions about perceived innovation and creativity. The questions are based on a literature review and were adopted from a published and validated questionnaire (Zhou & George, 2001).

We used descriptive statistics to define the most important issues from the data. This part of the research is correlational (descriptive) to describe a phenomenon and examine relationships between variables. We represent and summarize hereafter. Then we used statistical inference to test the research hypotheses. We based our methodology on comparing means of variables of interest according to the research hypotheses by categories of respondents by their profiles. The differences between high-tech workers who work from home and those who work in their offices will be examined in terms of their level of creativity and innovation.

2.1 Sample

The research population is managers, mainly from the high-tech industry in Israel. Our sample includes 192 respondents that thoroughly answered our questions. There are 148 males and 44 females. The portion of Their age varies from 20 to 50, averaging 33.1 years. The Kolmogorov-Smirnov test for normality of the age distribution is accepted with $p < 0.001$.

The respondents ranked their tasks for management as management positions (18.2%), medium level (58.9%), and lower level (22.9). Thirty-two respondents (16.6%) have no academic education, but 69.3% have more than two years of academic studies. Considering the marital status of the responders, 45% are married, but 71% have no kids, and 25% have one or two kids.

About 78% of the respondents work from the office, and 22 % work from home. This empirical distribution fits the situation in the population of Israel in 2022. The numbers are relevant to 2022 when no forced regulation existed to work from home.

3. Findings

We conducted a descriptive statistical analysis followed by statistical inference. The portion of females working from the office is much larger than males; the significant level of the Chi-square test is 0.038. The finding raise much interest and there is an impact on whether the respondent is married or single.

There is no correlation between the hierarchical position of a worker in an organization and office work. Nevertheless, the finding is that management people tend to work more at home, with a significant level of $p = 0.015$.

When checking for the task area of respondents, we found that hi-tech workers in development departments tend to work more at home than in the office. While in our sample, 23% work from home, 34% of development department workers work from home. This difference is statistically significant and elaborates on the aims of this study. Development workers in the hi-tech industry are expected to have more innovative and creative characteristics.

We asked the respondents to mark between 1 and 5 the extent of six statements, as 1 is the lowest extent and five is the highest. The six variables are taken from a verified questionnaire Zhou and George (2001) reported. We provide the study variables in Table 1, their means, and standard deviations.

Table 1: Descriptive statistics of the study's variables.

		Mean	S.D.
1	I will come up with new and practical ideas to improve the execution of the task.	4.29	.799
2	I will look for innovative technologies, processes, techniques, and ideas to accomplish the task.	4.26	.886
3	I will suggest new ways to ensure quality in the execution of the task	4.33	.751
4	I will be a good source of creative ideas for how to accomplish the task	4.09	.839
5	I will be riskless in carrying out the task.	3.82	1.034
6	I will come up with creative solutions to the problems that will arise during the execution of the task.	4.30	.750

Besides variable five about the risk, the other variables have relatively averaged high scores ranging from 4.09 to 4.33. Also, their standard deviations range from .75 to 0.839.

The correlations between the two variables were measured by Spearman correlation and provided in Table 2. While all variables are significantly correlated, the correlations of variables five and 3 with the other variables are smaller.

Table 2: Spearman correlations of the six variables

	1	2	3	4	5	6
1	1.000	.620**	.485**	.618**	.350**	.677**
2	.620**	1.000	.404**	.541**	.382**	.570**
3	.485**	.404**	1.000	.455**	.258**	.378**
4	.618**	.541**	.455**	1.000	.302**	.609**
5	.350**	.382**	.258**	.302**	1.000	.468**
6	.677**	.570**	.378**	.609**	.468**	1.000

The number of each variable corresponds to the number in Table 1.

**) Correlations are significant at 0.01 level.

The alpha Cronbach is 0.847, so the six variables are relevant. This finding led to dimension reduction using factor analysis to define the relevant factors.

We ran a principal component-based factor analysis with rotation on these six variables, which gave us three constructs. The first construct contains variables 1,2,4, and 6, with high, almost equal loadings. We named it Perceived Creativity Construct. Variable 5, which reflects the extent of overcoming risk to achieve better performance, is with high loadings and named Risk Construct. We constructed the third factor by variable 3, Creativity for Quality Construct. The level of variance explained is 82%.

We computed the mean difference of each construct concerning working from home or office. We provide the findings in Table 3.

Table 3: Comparing means by working from office and working from home.

		Mean		P-value (One side)
		Office	Home	
1	Perceived Creativity Construct	4.25	4.28	0.387
2	Risk Construct	3.75	4.17	0.060
3	Creativity for quality Construct	4.30	4.52	0.035

We can test our first research hypothesis using the Perceived Creativity Construct. We conclude that working either from home or from the office ($p=0.387$) has no impact on the perceived creativity of people. Therefore, we rejected our hypothesis 1.

We ran t-tests on the risk construct. The finding about risk is interesting. People that work from home are ready to take more risks to accomplish their assignments (mean=4.17). They use more creative ways, according to their perceived attitude, and confront problems. People who are more risk averse prefer to work from the office (mean=3.75) and not look after risky creative approaches to solve problems. We accept our second hypothesis ($p=0.06$).

Our third hypothesis deals with creativity for better quality. From the finding, people that work from the office use less effort to find ways to ensure better quality (mean=4.30). We interpreted that these employees rely on cooperation with others in their working places. We accept our third hypothesis ($p=0.035$) that people working from home seek creative ways (mean=4.52, $p=0.035$) to ensure better quality.

4. Discussion

The findings of this study lead us to interesting findings that should be treated carefully. The revealed preference of people that work from their home rather than from the office may have managerial considerations about what type of assignments should be assigned to workers from home or in the office. The portfolio of people in the office should be related to the capabilities of workers to work in teams to share ideas and to encourage each other to explore more creative ways to get better performance.

The study gives some light on the attitude of females and males regarding working from home. We show that women in the hi-tech industry tend to work from the office. We found no significant impact of the task and the position of women on their workplace preferences.

While the hierarchical position in a hi-tech organization has no impact or correlation with working from home, still, managers prefer to work from home. This statistically significant finding relies on a small sample.

The hi-tech development workers tend to work from home. This finding is relevant to the aim of this study, as development workers, especially in the hi-tech industry, are expected to be more innovative and creative. This finding agrees with our hypotheses 2 and 3.

The perceived creativity of hi-tech workers working from home or the office is the same. Workers that work from their home state are willing to take more risks to solve problems. We interpret that they use more innovative and creative acts that may require more risk-taking.

We can draw some managerial rules from the study about what assignments we assign to high-tech workers from home or in the office. These recommendations are also crucial in recruiting human resources. When posting teams of workers, we recommend exploring their attitude toward risk while looking for better innovative working processes.

We interpret the third hypothesis as hi-tech workers from home ready to take more creative and innovative ways to ensure quality. The third hypothesis was accepted, and it reflected that. The second and third hypotheses encourage more research on these specific issues of creativity for quality and success for working from home.

5. Conclusions

The study gives some highlights after years of experiencing working from home and working from the office. We conclude that, generally, perceived creativity is the same for those ways of work. Nevertheless, some personality traits might be expected for those working from home.

Organizations that are willing to increase the level of creativity in general and for purposes are encouraged to view the preferences of their employees concerning working from the office or home.

We show that the people working from the office are looking for creative ways to confront risk and increase quality. They are more independent workers that may need less support from others to reveal more creativity.

We recommend studying hybrid working methods from home and office for further research. This research treats perceived creativity, yet it is suggested to use objective mechanisms to test the creativity level of workers.

The results are based on an adequate number of respondents, but it would be better to expand the research population. The study deals with perceived aspects of creativity and innovation personality traits. We recommend searching for objective elements and, if possible, measurable.

Acknowledgement

We want to thank Mr. Steve Katz, M.Sc. from HIT, for his data collection and lit review input.

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