

# Senior Faculty Opinions on the Significance of Retirement Age - Employing Natural Language Processing

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## Abstract

This study is a pioneer study examining the significance of retirement in terms of lost investments and outcomes. Research findings on the output of academic faculty and on measures of excellence in higher education indicate that upon retirement the academic institution as an organization loses not only faculty who are still capable of contributing both to research and to teaching, but rather also two other important products: valuable knowledge and experience accumulated by senior faculty in the academic system in light of the institution's investments in them.

107 questionnaires were collected from senior faculty members in a case study of one academic institution. A combined research method was utilized, consisting of qualitative and statistical analysis, with the aim of exploring the significance of retirement in terms of lost input and output, as perceived by academic faculty members. The research findings indicate that indeed, as perceived by the faculty, academic institutions as an organization lose faculty who are still capable of contributing to both research and teaching, as well as valuable knowledge and experience accumulated by senior faculty members within the academic system, after being nurtured by the academic institution.

**Keywords:** retirement age, retirement, employment, academic faculty

## 1. Introduction

One of the main questions that all employers contend with is how to preserve knowledge in the organization and channel it towards the firm's future business development. At present, Israel's labor market is suffering from a serious shortage of experienced workers and on the other hand a lack of accumulated knowledge and experience.

According to Avi Hasson, Chief Scientist in the Israeli Ministry of Economics and former Chairman of the Innovation Authority (Glyker, 2017), there is a shortage of thousands of engineers in Israel, and this is a growing trend. In light of the situation, economic/industrial firms are launching guidance centers for young people in order to cope with the knowledge shortage and in the aim of training the future generation, with knowledge constantly disappearing in these firms due to the retirement of experienced workers when reaching retirement age. An emerging solution is finding a way to retain retirees within the labor market and to continue benefiting from their expertise, knowledge, and experience in a work model of project-based outsourcing.

The advantages of employing retired workers are many and varied:

**Diversifying knowledge and approaches:** At present, organizations know that diverse work teams encompassing experts from different backgrounds and disciplines lead to better business outcomes. Experienced retirees bring with them knowledge that is much more than theoretical, as it has already proven its worth, been tried out and renewed until showing that it works.

**Specific knowledge required:** Many firms are currently utilizing "old" programs, most of which are based on technologies that have changed, sometimes in a relatively short time span of three or four years. Some of these technologies are no longer learned at universities and colleges. The average age of people who are familiar with the changing technologies is 60. Any update, change, addition, and maintenance of these technologies requires knowledge that does no longer exist, and as a result these firms invest precious time in training workers within

the company.

Expertise is a combination of knowledge and experience that manifests itself as improved or higher-level performance than would be expected by the uninformed and inexperienced (Al-Benna, 2012). When an older expert departs from a knowledge-intensive organization, valuable knowledge is lost (Joe, Yoong & Patel, 2013). Knowledge loss includes subject matter expertise, knowledge about business relationships and social networks, organizational knowledge and institutional memory, knowledge of business systems, processes, and value chains; and knowledge of governance (ibid.).

In order to enjoy the advantages of employing expert retirees, it is desirable to examine: Does the firm need knowledge that no longer exists in the organization? Such as knowledge in programming involving computer languages that are no longer applied or studied today but are still useful. Does the firm need knowledge that constitutes a foundation for future development?

### *1.1 The Market is Transitioning to An Outsourced Employment Model*

The freelance market in Israel and around the world is on the rise and the estimates (Joe, Yoong & Patel, 2013) are that by 2020 freelancers will constitute 20% of the national workforce. Companies are wisely utilizing the knowledge resources of freelancers who are experts in their field, and it is important to also enter in this equation the specific expertise that is accumulated over the years and with experience.

Today's retirees are up-to-date, technological, and productive. With the rising life style, life expectancy, and declining retirement age, current day retirees are an active, productive, energetic part of the population that is eager to contribute and to engage. Among the entire population and also among those aged 65 and older, an association has been found between the level of education and the rate of participation in the workforce – the higher the education levels the higher the rate of participation in the workforce.

In 2015, 19.1% of those aged 65 and older were participating in the workforce (26.9% of men and 13% of women). Forty nine percent of those aged 65 and older were using the internet, including electronic mail, versus 83% of those aged 20-64. In this area, a rise is evident over the years: In 2005 only 13% of those aged 65 and older were using the internet (versus 53% of younger people). In the modern world there are many programs for integrating retirees in industry. They aim to utilize the knowledge resource for the public good and to provide retirees with an occupation, interest, and the opportunity to contribute. Examples as follows in the next sub sections.

#### *1.1.1 Senior Environmental Employment (SEE) Program*

This program for employing retirees in the environmental field enables American retirees over 55 to share their expertise with the Environmental Protection Agency (EPA) and thus remain active and utilize their capabilities in support of various environmental programs and activities. The program is funded by grants provided by the American government and is carried out in collaboration with seniors' organizations throughout the US (Glyker, 2017).

#### *1.1.2 Elder Wisdom Circle – E-mail Advice from Seniors Program*

In the Elder Wisdom Circle program, retirees interested in contributing to the community correspond via e-mail with needy and/or lonely young people who need advice and help in a range of areas, and provide them with advice and support based on the experience and knowledge accumulated over life. Hence, the seniors enjoy the satisfaction of helping others and the young people receive counseling and psychological support (Glyker, 2017).

The org specialization program operates throughout the US and is aimed at providing jobs to retirees with expertise in various fields, who are interested in continuing to work. In this program, senior workers receive a second career in fields compatible with their advanced knowledge and capabilities, but also impart satisfaction and working for a lofty goal.

### *1.2 Municipal Initiatives Examples*

A municipal program to integrate the older population in the workforce (Nahariya Municipality, 2020). Over 200 placements were performed within a unique program of the multidisciplinary center for adult employment that connects retirees aged 60+ from Naharia and northern Israel to employers and helps integrate them in the labor market. The employment program for those aged 60+ is a three-year pilot that began two and a half years ago in Naharia. The partners in the program are: Eshel – JDC, the Naharia municipality, Telem, the National Insurance Institution, the Ministry of Social Affairs, and the Ministry for Senior Citizens.

The program has two main aims: to provide employment and a source of subsistence to those aged 60+ whose life expectancy is rising and to utilize an enormous potential for the labor force, which is lost with retirement.

The multidisciplinary center for adult employment has a high-quality database encompassing hundreds of workers aged 60+ in diverse fields, such as: metalworks, technical work, sales and telemarketing, administration and management, accounting, support and care for the elderly, supervising exams, and more.

### *1.3 What Happens in Academia?*

The topic of quality measures and the output of academic faculty members is one of the most significant in the study of higher education around the world. In Israel, beginning from 2002, for 18 years the Council for Higher Education (CHE) has been engaged in quality assessment of several departments at all academic institutions in the country, both universities and colleges.

A list of studies on the performance measures of academic faculty members, based on their activities in research, teaching, academic administration, and contribution to the community (Davidovitch & Sinuani-Stern, 2014; Davidovitch, Soen, & Sinuani-Stern, 2011), show that the number of faculty members who receive excellence rewards has been growing over the years. Moreover age, which comes together with seniority, tenure, and senior academic rank – constitutes a significant background variable for excellence in one's academic career and the attendant output.

### *1.4 On Academic Output: Research and Teaching*

Evaluation of faculty activities and rewards for performance are critical topics in academia in general and in Israel's system of higher education in particular (Wadsworth, 1994; Gillespie, Hilsen & Wadsworth, 2002). Faculty at academic institutions perform a wide range of activities that include teaching, research, participation in conferences, submitting research grants, academic administration, community service, and more (Davidovitch & Sinuani-Stern, 2014).

The main questions examined in previous studies addressed the contribution of faculty members in their fields of activity, evaluated as "excellence criteria" – in research, teaching, and contribution to the community (Sinuani-Stern & Davidovitch, 2007).

### *1.5 Age, Gender, and Output*

Previous studies found a strong association between the age of faculty members and their chances of receiving excellence rewards. The current study examined the significance of retirement, in terms of lost input and output, considering the academic performance of faculty members, in a case study of one university. We also addressed the variable of age, which usually includes seniority, tenure, and senior academic rank. With regard to the ranks of men and women – about 40% of the men were professors (full and associate), while the proportion of women in these ranks was only about 6% (!). With regard to the gender variable – previous studies found a strong association between gender and receiving excellence rewards: the proportion of men who received an excellence reward was significantly higher than the proportion of women, about 40% on average; the proportion of female faculty members who received such a reward over the years was about one quarter on average of women.

In conclusion, previous studies show that the probability of receiving an excellence reward rises the higher the faculty member's senior rank (prof.), and if one has tenure and is a male. In light of the research and teaching tasks that are the flagship of academic tasks, the purpose of the current study was to examine the significance of retirement in terms of lost input and output, as perceived by faculty members.

According to the above, the research hypotheses are as follows.

- H1. Retirement expressions positively affect expressions regarding knowledge.
- H2. Retirement expressions positively affect expressions regarding experience.
- H3. Knowledge expressions positively affect expressions regarding experience.
- H4. Retirement expressions positively affect expressions regarding faculty.
- H5. Expressions regarding faculty positively affect expressions regarding enablement.
- H6. Expressions regarding enablement positively affect expressions regarding research.
- H7. Expressions regarding enablement positively affect expressions regarding teaching.

## **2. Method**

### *2.1 Initial Sample*

A questionnaire was distributed online to the senior faculty members of Ariel University, Israel, using Google Forms. One hundred and seven completed questionnaires were collected. The survey included six open questions and demographic data. The questions regarded faculty's opinions on the advantages and disadvantages of a set

age of retirement, older staff, the desire to continue working, and how it can be done.

Fifty of the respondents were females and 55 males. Two respondents did not indicate their gender. The respondents' age range was 36-49 (34 respondents), 50-60 (30 respondents), and 61-84 (29 respondents). Fourteen respondents did not record their age. Respondents came from 17 different departments.

We employed a mix methods research, which combines the strengths of both qualitative and empirical methods (Davidovitch & Eckhaus, 2019a, 2019b).

2.2 Analysis

The model's goodness-of-fit was tested using Structural Equation Modeling (SEM) (Eckhaus, 2019). Model fit was estimated using RMSEA, TLI, CFI, and CMIN/DF (Forestier et al., 2018). Cutoff values >0.95 indicate a good fit for CFI and TLI, and values ≤.08 for RMSEA (Hinz et al., 2017). The CMIN/DF ratio should be less than 3 to be acceptable, and less than 2 to be "good" (Gunn, Burgess, & Maltby, 2018).

2.3 Text Analysis

For text analysis we used TEXTIMUS 1.0 (Eckhaus & Ben-Hador, 2019). The software is designed for text mining and included support for Natural Language Processing (NLP), sentiment analysis, and latent themes discovery.

First, we used the N-gram frequency model. N-gram refers to a contiguous sequence of n words from a given text string. It is widely used for NLP applications such as machine translation, text summarization, and information retrieval (Gadag & Sagar, 2016).

Next, we used the Bag-of-Words (BoW) approach (Eckhaus & Davidovitch, 2018a, 2018b). According to BoW, a pre-defined set of keywords is explored in the documents; each keyword has a value indicating the number of times it appears in the document or in a binary representation, if the word appears. We therefore analyzed the frequency of the words in the combined set of respondent texts, and compiled into groups the words with the highest frequency of the research variables. These groups were then summed by their frequencies to create the variables, as follows. Retire - words that speak of retirement, such as "retirement", and "to retire". Enable – words that speak of enabling, such as "to enable", and "enabling". Knowledge, Experience, Faculty, Research, and Teach.

After developing the model, we examined Age and Gender, as typical control variables (Davidovitch & Eckhaus, 2019a; Eckhaus & Davidovitch, 2019a, 2019b) of the variable Retire.

3. Results

The correlations, means, and standard deviation values between the research variables are presented in Table 1. Since Gender was binary coded, we present Spearman correlations.

3.1 Recruitment

Provide dates defining the periods of recruitment and follow-up and the primary sources of the potential subjects, where appropriate. If these dates differ by group, provide the values for each group.

Table 1. Correlation matrix, means, and SD

	<i>Retire</i>	<i>Enable</i>	<i>Knowledge</i>	<i>Experience</i>	<i>Faculty</i>	<i>Research</i>	<i>Teach</i>
<i>Retire</i>	-						
<i>Enable</i>	-.01	-					
<i>Knowledge</i>	.26**	.01	-				
<i>Experience</i>	.57***	.06		-			
<i>Faculty</i>	.21*	.30**	.08	.23*	-		
<i>Research</i>	.05	.28**	.06	.004	.31**	-	
<i>Teach</i>	0	.37***	.08	.15	.08	.32**	-
Mean	.33	.39	.32	1.23	.71	.66	.51
SD	.76	.83	.56	.96	1.06	.96	.78

\*p<.05, \*\*p<.01, \*\*\*p<.001

Note. Place table caption in front of table body and description below the table body. Avoid vertical rules. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article. You may resize the tables to fit the page size.

Figure 1 illustrates the model and standardized coefficients.

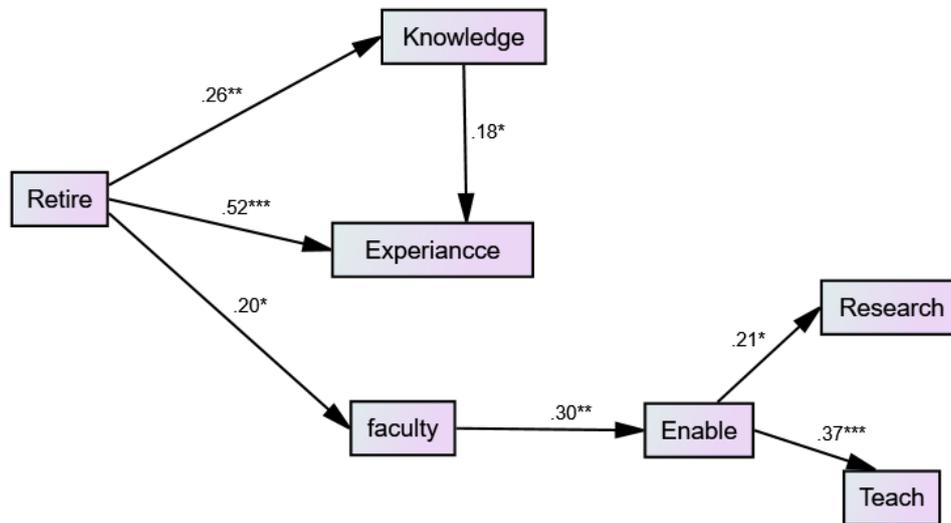


Figure 1. Model and standardized coefficients

\* $p < .05$ , \*\* $p < .01$ , \*\*\* $p < .001$

The hypothesized model showed a good fit: CMIN/DF = 1,  $p > .05$ , CFI = 1, TLI = 1, RMSEA = 0. All hypotheses were supported. Retire positively affects Knowledge (H1). Retire and Knowledge positively affect Experience (H2 and H3 respectively). Retire positively affects Faculty (H4), Faculty positively affects Enable (H5). Enable positively affects Research (H6) and Teach (H7).

From Figure 1 we observe that retiring faculty have the capabilities of both research and teaching, on one hand, they have knowledge and experience gained over the years.

#### 4. Summary and Discussion

This study explores the significance of retirement as perceived by academic faculty members. The system of higher education invests a great deal in research and teaching by faculty members – through participation in conferences, grants for excellence, teaching workshops, and more – the question is whether the knowledge and experience are lost prematurely.

The current research findings indicate the clear abilities and advantages of faculty members who retire from academic institutions at the set age of retirement, with regard to both research and teaching. From the point of view of faculty members, when faculty retire the institution loses a person who has been trained for years at his or her academic place of employment and source of growth. The faculty member advanced in both research and teaching, sometimes even acquiring management skills, accumulated experience, and was compelled to retire although feeling at the height of his or her abilities.

The research findings show that not only does the institution lose a trained faculty member, rather in addition to the research and teaching capabilities the institution also loses another valuable product. The vast amount of experience and knowledge acquired by the retiring faculty member have distinct value. Even if the researcher does not engage in research or teaching, his or her knowledge and experience can serve the institution by guiding and accompanying new faculty members, membership on committees that require experienced personnel, guiding graduate students, as well as technology-based teaching in order to preserve the knowledge of reputable faculty members.

The current research findings may illuminate challenging thoughts regarding integrating the experience and knowledge of experienced personnel – while also accepting new faculty who will operate within the system of higher education until retiring.

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