

# Factors Causing and Countermeasures Study of Employee Turnover in a Research Institute

Congying Wang, Xue Gao, and Daqian He

**Abstract**—In current economic climate, turnover becomes a universal social issue. Especially in the knowledge intensive scientific research units, if the employers do not analyze the reason for leaving and adjust the management measures timely, it will not only causes many unnecessary costs, making the enterprise human resources work in the cycle of ‘hiring-departure-rehiring’, but also cause the loss of intellectual capital, hinder the completion of the scientific research and production. This paper takes A Scientific Research Institute as an example to discuss how to carry out relevant human resource management work by studying the reasons of employee turnover, and employee performance with high turnover rate. The suggestion is we should give consideration to the school's comprehensive ranking and employee stability during recruitments, pay close attention to employees of electronic majors and the PHDs by offering proper salary and concerns, and establish feedback mechanism to deal with the complain properly.

**Index Terms**—Turnover, human resource management, performance, recruitment.

## I. INTRODUCTION

With the advent of knowledge economy, the competition among enterprises is not only the competition of talents, but also the competition of knowledge, which has become the key capital for the survival and development of enterprises [1]. In recent years, the problems caused by both individual demission and group demission are becoming more and more prominent. Especially, the enterprise is faced with huge risks and losses because the employees take away the resources such as technical knowledge after demission. Enterprise employees are the carriers of knowledge, and the loss of knowledge in enterprises is mostly hidden knowledge loss, especially the organization tacit knowledge gradually formed in the daily operation of enterprises. As the problem becomes more and more serious, it is paid more and more attention by enterprise managers.

## II. EMPLOYEE TURNOVER

Employee Turnover refers to the process of termination of the organization membership by individuals who obtain material benefits from the organization. There are two types of turnover [2]: Voluntary Turnover and Involuntary Turnover. Turnover rate is one of the important indicators to investigate the internal human resources of an enterprise. It directly shows the flow of human resources. By investigating

this indicator, employees' satisfaction with their work and the human resources strategy adopted by the enterprise can be understood. The turnover rate is not the lower the better [3]. A certain turnover rate can keep the enterprise in proper talent flow and establish a reasonable talent competition system to maintain the enterprise's vitality and innovation consciousness [4]. However, if the turnover rate is too high, it indicates that the company has not formed a centripetal force or the promotion channels of employees are blocked, or the compensation system is unfair.

Based on the research results at home and abroad and the actual circumstances of the turnover of the research institute, the reasons affecting the turnover intention of the employees are analyzed from the macro to the micro level, that is, environmental factors, organizational factors and individual factors [5].

### A. Environmental Factors

Environmental factors refer to the influence of external environment on employee turnover. Scholars at home and abroad mainly emphasize it as a regulating factor. The value concepts such as the corporate culture of an economic environment company such as the policy of supporting talents in the external environment, such as salary and welfare, may be the influencing factors of the turnover of employees in the research institute.

### B. Organization Factors

From the perspective of the organization, the factors of employee turnover may also come from some problems existing within the organization. On the one hand, it is related to job-related factors, including job nature, job pressure, role pressure and diversity of work tasks, etc. On the other hand, it is related to organizational management, including salary management, employee training, career management and organizational culture.

### C. Personal Factors

The personal factors of employee turnover can be summarized in two aspects. On the one hand, it is demographic factors, including individual's social life characteristics, professional characteristics and personality characteristics; on the other hand, it is generated by the interaction between individuals and organizational factors. From the perspective of personal psychology, it is an attitude towards organizational management process, mainly including employee's job satisfaction, organizational commitment, etc.

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### III. TURNOVER ANALYSIS IN A RESEARCH INSTITUTE

A Research Institution is of high-level scientific research level and is involved in a knowledge-based business. At the same time, it has undertaken several key project development tasks, and the scientific research task is very difficult. High-quality employees are its core assets. This institute has a galaxy of talents, all of them are graduates from top 100 universities such as Tsinghua university, Peking university and Shanghai Jiao Tong University. On average, more than 100 people are recruited every year. However, in recent years, due to the salary competition in the Internet industry, the traditional advantages of an institute have gradually disappeared, and it is faced with the grim situation of ensuring the completion of tasks by A stable team [6].

With the continuous increase of workload and slow increase of total income, the turnover rate of A Research Institution begins to increase. According to the institute's satisfaction survey of all new employees within five years, only 7 percent of respondents said they were satisfied with their pay and 17 percent said they were likely to leave or had the opportunity to do so.

#### A. Turnover Caused by Environment Factors

##### 1) Industry influence

In recent years, the average salary in the Internet industry has been much higher than that in other industries. Therefore, computer communication and other related electrical professionals quit more than other majors as shown in Fig. 1.

The gap between psychological expectations and reality caused by environmental factors is not often recognized by the institute's managers, because such employees will only attribute their resignation to simple personal reasons, whether it is in the reason column on the resignation form or in the process of exit interviews.

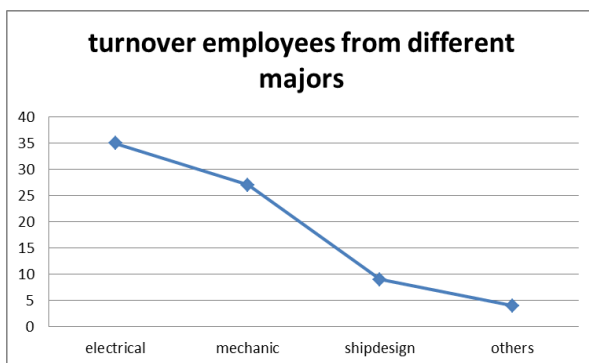


Fig. 1. Turnover employees from different majors.

##### 2) Regional influence

About two-thirds of those leavings are new employees from other places, and about one-third are local. The foreign employees' turnovers rate is much higher (among the new employees, The proportion of non-local household registration accounts for half). Besides, turnover rate due to the problem of family separation (couples or friends) accounted for nearly 30%, which was considered as the second major factor.

#### B. Turnover Caused by Organization Factors

##### 1) Failure of adjusting to the overload

Analysis of the overtime of those who resigned within one

year after entry shows that those employees' overtime is 20% higher than the other leavers and they preferred to work in universities because the way of working is more independent.

##### 2) Staffing of government affiliated institutions

The external factors leading to the departure are mainly reflected in the impact of the Internet industry on the salary competition of electrical professionals. To discount this factor, annual turnover change is analyzed with employees of electronic majors separated as shown in Fig. 2.

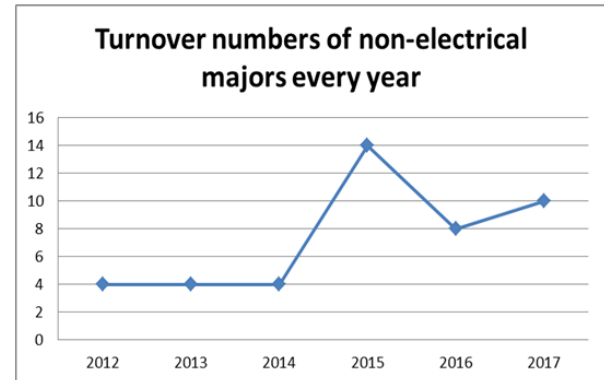


Fig. 2. Turnover numbers of non-electrical majors every year.

It is can be seen from this figure that ignoring external factors of industry, the number of turnover after the year of 2015 increased greatly. In consideration of inner factor of organization, it is most possible due to that staffing of government affiliated institutions was limited after the year of 2014, which decreased the new employees' sense of belonging.

#### C. Turnover Caused by Personal Factors

##### 1) The three-year glitch

The statistics shows that job-hopping in a year or so is a kind of job-selection process and a process of mutual selection and recognition between employees and the organization. But job-hopping in three years or so is out of the external temptation and concern for their own growth after their maturity as shown in Fig. 3.

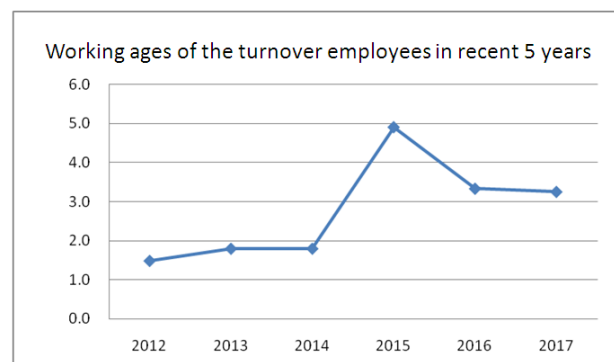


Fig. 3. Working ages of the turnover employees in recent 5 years.

This figure shows two points:

Before the year of 2014, more employees resigned in the maturing phase. Most of them found there is gap between ideal and reality in environment and culture.

After the year of 2015, more employees resigned in the process of training phase. Leaving out of the exception (it was the first time that an employee of 14 years working

length resigned), more employees chose to leave because of the lack of belonging and development. Their working lengths were about 3 years.

## 2) New plan of career development

Some new employees had no mature career development plan when starting their first job. After a period of working, some of them were getting familiar with the working mode and environment, and step by step defined themselves, thus recognized and planned their career development and chose to resign. The representatives of them are those who changed their job to universities. In the figure below we can see such cases count 50 percent as shown in Fig. 4.

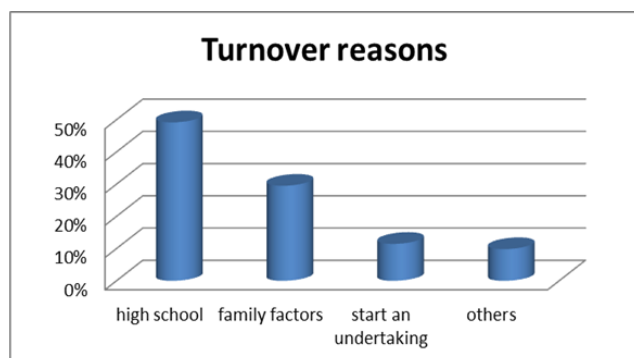


Fig. 4. Turnover reasons.

Due to this reason, the turnover ratio of PHDs is much higher than that of masters in the A research institution as shown in Fig. 5.

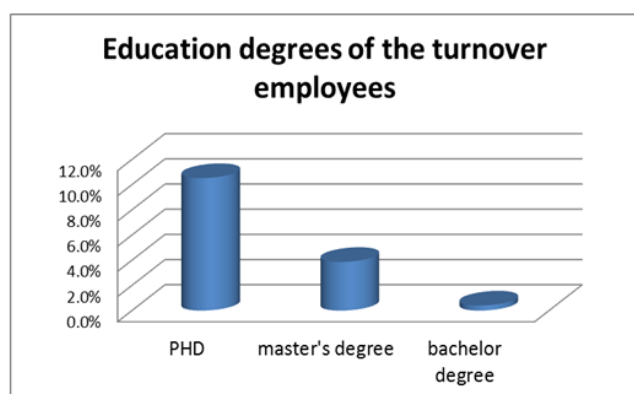


Fig. 5. Education degrees of the turnover employees.

## IV. PERFORMANCE EVALUATION OF HIGH TURNOVER RATE GROUP

### A. The Performance Evaluation of PHDs

In sense of that the turnover ratio of PHDs is much higher than master's degree staff; it is a problem whether the ratio of PHDs in recruitment should be decreased.

How to identify talent is very important for the development of enterprises. Throughout the history of China, there have been books related to the theory of talent identification thousands of years ago.

In the human resource management system, recruitment is one of the most difficult modules; involve psychology, behavioral science, etc. No matter how professional the human resource managers and experts are, recruitment still exist uncertainty, it is difficult to turn it into an exact science.

In recent years the A research institution has enhanced the recruitment and cultivation of employees. In the past 10 years, the ratio of PHDs recruited every year has increased from 3.4% to 25.8%.

To verify whether the highly educated employees behave better than others, the correlation between employees' performance evaluation results and their academic degree is analyzed.

### 1) Sample selection

The sample is consists of section chiefs and general technicians from No.1 Department and No.2 Department. The number sizes of these two departments are 377 employees and 213 employees.

### 2) Analysis method

Assignment of the annual performance ranking of each department is calculated. The person at the bottom of the rankings gets 1 point, the second-to-last gets 2 points and the rest can be done in the same manner;

For horizontal comparison purpose, the data is normalized to make the performance points equally distributed between -2 and 2. The normalization equation is as below:

$$\text{normalized data} = \frac{\text{raw data} - \text{average value}}{\text{standard deviation}}$$

- The normalized data is ranked;
- The points of employees of different degrees are analyzed.

### 3) Analysis result

The result is shown in Table I and Table II. The performance points are between -2 and 2. The above-average performance points are positive while the below-average ones are negative.

TABLE I: PERFORMANCE POINT—EDUCATION DEGREE ELATION IN DEPARTMENT 1

Average performance points	The year of 2016	The year of 2017
Bachelors	0.373	0.097
Masters	-0.065	0.038
PHDs	-0.705	-0.397

TABLE II: PERFORMANCE POINT—EDUCATION DEGREE RELATION IN DEPARTMENT 2

Average performance points	The year of 2016	The year of 2017
Bachelors	-0.121	-0.082
Masters	0.153	-0.005
PHDs	0.081	0.023

It is known from the tables that among the employees of Department 2,

In the year of 2016, PHDs and masters got significantly higher performance points than the others;

In the year of 2017, PHDs behave better than masters and masters behave better than bachelors.

The phenomenon that PHDs' average performance point is lower than masters' in the year of 2017 is mostly caused by the fact that in the 20 sample PHDs there are 12 new employees who had no advantages in valuating.

It is inferred from Table I that in Department 1 there is a

negative correlation between the performance points and the education background, which means that the highly educated employees got lower points than the others. The phenomenon can be reasoned: among the samples the average working length of PHDs is only 3 years and young employees of Department 1 usually got poorer valuation compared to those in Department 2. In recent 2 years most new highly-educated employees have been trying to adapting themselves to their job, thus got lower point. The result is shown in Table III.

TABLE III: AVERAGE SAMPLE WORKING AGE OF DEPARTMENT 1

Education degree	average working age
PHDs	3
Masters	7
Bachelors	19
Average	11

To eliminate the influence of working age, adjust the sample of Department 1 to the employees who entered from 2011 to 2015. The result is in Table IV.

TABLE IV: PERFORMANCE POINT—EDUCATION DEGREE RELATION IN DEPARTMENT 1 (NEW EMPLOYEES FROM 2011 TO 2015)

Average performance point	The year of 2016	The year of 2017
Bachelors	-0.028	0.081
Masters	0.254	0.300
PHDs	0.165	0.477

From Table IV it can be seen that after eliminating the influence of working age, evaluating results of PHDs and masters are above average in both 2016 and 2017. Especially, in the year of 2017 the PHD' performance was significantly better than the masters' and the masters' performance was significantly better than the bachelors'.

#### B. The Analysis of Performance of Employees from Top Universities

Turnover employees' universities are counted since the year of 2012. The top ones is extracted. Let's take these universities' graduates who entered the A Research Institution in the past 10 years as denominator to calculate the turnover ratio of each university's graduates. The result shows that the top-ranking universities' graduates have much higher turnover ratio. The result is in Table V.

TABLE V: RELATIONSHIP BETWEEN GRADUATION SCHOOL AND PERFORMANCE

Graduation School	Number	Proportion	Average performance
Graduate and Undergraduate Schools all top 39 universities	64	36.2%	0.348
Graduate from top 39 universities	21	11.9%	0.274
Graduate and Undergraduate Schools all top 100 universities	75	42.4%	0.170
Graduate from top 100 universities	8	4.5%	0.099
Rank 100 outside	9	5.1%	-0.139

It is obvious that the average performance is related to graduate schools. The employees graduating from top 39 universities make better performance than others. The longer they stay in top universities, the better they behave.

## V. CONCLUSION

It is too late to redeem after employees' resignation. To keep the talented, both the HR Department's and the specialized departments' efforts are necessary. This requires that in the everyday work, the administrators should translate the work of managing turnover employees into preventing turnover.

#### 1) Refining the work analysis and propose recruitment requirements for computer majors properly

Among the recruitment requirements of A Research Institution, the need for computer personnel is continuously growing. However, if the institution can't offer compatible salary and development opportunities, it will be hard to retain the talents. It is suggested that when making the recruitment requirements, further work analysis, description, division and development plan for these talents are necessary. This will lead to more precise recruitments and proper staffing.

Recruitment is a work of technical; How to recruit and interview, have different methods, but is difficult to draw a unified conclusion. Kinds of candidate reaction the society formation, making the recruitment become an interesting job. Finding the right people, the hardest part is not to pick a good resume, or ability test, or the hard work of doing recruitment propaganda everywhere, but how to judge a person's value. This process needs to constantly believe, constantly doubt, constantly disillusionment, constantly reconstruction, finally strike a balance. Human nature is objective and can not be changed; human heart is subjective, based on the law of change. The highest level of human resources work is to understand human nature, grasp the heart.

#### 2) Giving consideration to the school's comprehensive ranking and employee stability during recruitments

Basing on statistics, employees graduating from BUAA, BIT, HUST and SJTU have more stable working state. These universities are top-ranking at home and their graduates have lower turnover rates. Thus, it is proper to incline to these universities' graduates in recruitment. Because PHDs' stability is significantly lower than masters' and employees of electronic majors resign more often than the others,

#### 3) Pay close attention to employees of electronic majors and the PHDs by offering proper salary and concerns.

In recent years, the new employees have a high average IQ, ability to accept new things, strong sense of personalities and realistic values. They need more attention on the level of self-realization and personal space.

It is suggested that more attention should be paid to the new employees of electronic majors to make sure that they smoothly adjust themselves to the working environment and integrate into the group instead of arranging them with hard work. To develop their sense of identity, working opportunity they are interested in, advisors who can give guidance and help in both work and life, and timely affirmation and encouragement are necessary. The section chiefs and advisors should give new employees more guidance in career

development to help them identify long-term career goals. For those who can't adapt themselves to the new environment, job rotation and communication should be arranged to give them more opportunities.

4) *Establish feedback mechanism to deal with the complain properly*

New employees tend to have resignation psychology after their class unions or birthday parties. Thus, Managers at all levels should pay more attention to the words and deeds of their new employees, give more care to them, and observe their working attitude and state of mind at the graduation season and during their birthdays, to nip exit incentives in the bud.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

AUTHOR CONTRIBUTIONS

Congying Wang contributed to the conception of the study and wrote the manuscript. Xue Gao contributed significantly to analysis and manuscript preparation. Daqian He performed the data analyses. All authors had approved the final version.

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