TURNOVER INTENTION (JOB CHARACTERISTICS PERSPECTIVE) AMONG ELECTRICAL AND ELECTRONICS SUB-SECTOR EMPLOYEES IN MALAYSIA

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ABSTRACT

Job turnover is traditionally faced by organizations in many industries. Implications such as resources wastage and low productivity can be derived from turnover issue. Turnover intention was found to be a reliable predictor for actual turnover in previous studies. Consequently, this demands some insights on turnover intention issue especially within Malaysian context. This paper will focus on determining the relationship of job characteristics on turnover intention among manufacturing operators particularly in Electrical and Electronics sub-sector. The study was conducted amongst the operators of manufacturing industry in Peninsular Malaysia (N=800). Considering that Malaysia manufacturing industry has shown a strong economic growth through large investment in economic activities, it is important for all manufacturing companies to retain talented employees and reduce turnover problem in order to be more productive and competitive. The findings had accepted the research hypothesis. Dimensions of job characteristics (i.e. skill variety, task identity and feedback) had significantly correlated and contributed to the turnover intention. The findings had contributed to the theoretical significance through the examination of direct relationships between job characteristics on turnover intention among local operators in manufacturing sector based on the high turnover rate in Malaysia manufacturing sector between the years 2008 until early of 2011.

INTRODUCTION

Since 2010, Malaysia manufacturing sector has shown a strong economic growth through large investment in economic activities. As a result, job vacancies available in manufacturing sector have raised compared to other sectors at 39 percent of total positions out of the 1.8 million positions offered (Economic Report, 2010). With the high employment opportunities in this sector, it is important for all manufacturing companies to retain talented employees and reduce turnover problem in order to be more productive and competitive. Furthermore, with significant contribution to Malaysian economy based on its reputation and fast development, the real value-added per worker in manufacturing sector has increased from RM49,013 in 2000 up to RM78,707 in 2010 (Economic Report, 2010).

However, being globalised orientation these days, manufacturing sector is struggling to stay substantial in marketplaces in many ways (Zhang & Sharifi, 2000; Fathi, Eze & Goh, 2011), including to reduce turnover rate among employees. The turnover issue is a common problem that is constantly faced by the management in companies and industries. In a recent development, Malaysia manufacturing sector has become a critical sector for employee turnover issue compared to other sectors. Besides, even with job opportunities are highly offered, high employee's turnover is recorded in this sector and has become crucial stage for manufacturing sector to address this issue.

The turnover rate in manufacturing sector in many countries including Malaysia is high compared to the other sectors due to employee turnover complexity. According to Ministry of Human Resource Malaysia (2011) also known as MOHR, the manufacturing sector is the highest sector with job turnover difficulty since 2008 until 2010 as shown in Table 1.1. Based on the report, a total of 36,392 employees in the manufacturing sector were involved in job turnover crisis. This number represents 75 percent of the total turnover rate from all sectors in Malaysia. Although the unemployment rate is high, the Labour Department of Peninsular Malaysia (2010) reported that 11,957 of employees left companies voluntarily from year 2008 until 2010 and 86 percent of the total number came from manufacturing companies. Voluntary turnover spells disaster for companies because of the loss of money and time resource spent on recruitment, re-skilling as well on training and development activities for new joiners.

As stated by Hasin and Omar (2007), in order to retain and develop excellent performance in organizational, managers have to focus on actual voluntary turnover due to high cost involved for the loss of employees. To avoid such waste, companies should manage it by investigating more on turnover intention aspect as the best predictor for actual voluntary turnover is turnover intention (Mobley, 1982).

The current number stated for voluntary turnover in Table 1.1 is a precursor to the importance of examining the rationality and causes that influence turnover intention. As stated by Foreman (2009), high rate of turnover correlates with turnover intention compared to those employees who plan to stay in companies. As a result, the purpose for this study is to examine factors that lead to turnover intention among manufacturing workers in Malaysian environment.

Table 1.1

Statistics of Voluntary and Involuntary Turnover Based on Sector from Year 2008 to 2010.

Sector	Voluntary Turnover No of Worker	Involuntary Turnover No of Worker	Total
Real Estate, Renting & Business Services	336	2,274	2,610
Community, Social & Personal Service Activities	209	1,496	1,705
Electricity, Gas & Water Supply	5	156	161
Hotels & Restaurants	26	796	822
Health & Social Work	0	125	125
Finance	196	568	174
Construction	150	775	925
Manufacturing	**10,321**	**26,071**	**36,392**
Education	0	22	22
Transport, Storage & Communication	359	880	1,239
Public Administration, Defence & Compulsory Social Security	27	179	206
Wholesale & Retail Trade, Motor Vehicle, Motorcycle, Household	296	2,080	2,376
Mining & Quarrying	32	210	242
Agriculture, Hunting & Forestry	0	996	996
Total	**11,957**	**36,628**	**48,585**

OBJECTIVE

To determine the relationship of job characteristics on turnover intention among manufacturing operators particularly in Electrical and Electronics sub-sector

LITERATURE REVIEW

In manufacturing context, task rotation, repetitive routine and scheduling activities are part of job aspects that surrounded by operators which have caused to boredom effect. According to Nader (2009), factors such as skill learning and effective scheduling have been proposed to reduce the lack of efficiency and productivity in manufacturing. Based on the manufacturing setting, this study will identify how do operators perceive their job characteristics factor in influencing future job outcomes of turnover intention.

According to Hackman and Oldham (1975), a job characteristic is "designed to enhance the internal work motivation and the job satisfaction of people who do them" (p.4). As claimed by Dore (2004), the job characteristics theory is considered flexible in term of adoption in a diverse environment for employees and organizations. Additionally, as stated by Hodgetts (1991), the theory of job characteristics can be defined as "a work motivation model that shows the relationships between core job dimensions, critical psychological states, and personal work outcomes" (p.212).

Several of organizational outcomes such as high job satisfaction, job performance and decreasing of absenteeism and job turnover are produced by a meaningful job characteristics aspect (Awamleh, 2007). Furthermore Slocum (1981) describes that employees will be perceived their efforts and task as significance and worthwhile through a higher-order needs satisfaction and it is how job characteristics affect employee's attitude.

The JCM is divided into five core dimensions of job namely (1) skill variety which reflects a diversity of skills that required to perform different job activities; (2) task identity is perceived as the completeness of the work given; (3) task significance which brings a substantial impact on other's live; (4) job autonomy is freedom provided in how the work should be done and finally (5) job feedback which the information is given pertaining to how well work performed.

According to this model, the elements of critical psychological states such as "responsibility for its outcome", "knowledge of the results" and "experience the meaningfulness in the work" are expected to be encountered by employees that engaged with high dimensions (i.e. skill variety; task identity; task significance; autonomy and feedback) of job characteristics. The effects of high internal of work satisfaction, high quality performance and lower absenteeism and job turnover are the results produced through the psychological states.

The purpose of job characteristics as stated by Hackman and Oldham (1975) is to determine an improvement effort of job characteristics dimensions and to measure how the expansion made will affect on employees readiness response. Overall, job characteristics are expected to contribute on motivation and satisfaction enhancement through a job redesign activity.

Additionally, according to Boonzaier, Ficker and Rust (2001), the satisfaction towards job characteristics for particular job can be achieved through the meaningful of task characteristics, the sense of significant and responsibility towards task performed as well information provided after completing tasks assigned. Thus, the effort to design and improve the job characteristics aspect should be taken place (Elanain, 2008) in any types of job in order to generate high of motivation, performance, satisfaction and low of absenteeism and turnover. Furthermore, there are three important motives on the Turner and Lawrence's Requisite Task Attributes Theory as highlighted by Robbins (1993). Firstly, employees in different types of job will react differently towards their tasks. Next, this theory has presented a set of task attributes by which jobs can be measured. Lastly, it emphasized on the importance of employee's differences on their reactions towards particular job.

A secure and attractive work design is demanded by workers at the same time as companies are looking for high talented employees. Hence, it showed an importance to identify the work outcomes of job characteristics aspect (Parker, Wall & Cordery, 2001). Furthermore, the main objective is to influence employee's job satisfaction and job

performance (Ambrose, 1999; Dodd & Ganster, 1996). According to Udo et al., (1997), the satisfaction in work characteristics is noteworthy for employee's retention. Besides, employee's attitudes, beliefs and feelings are also affected by how well the characteristics of the job provided for individuals (Lawler & Hall, 1969) and subsequently portrayed the organizations effectiveness in management aspect. The efficiency and productivity facet in working environment are the major purpose of job characteristics (Chu & Lai, 2011). According to Boonzaier et al., (2001), the high motivation and satisfaction can be gained through well-designed of job characteristics which is a valuable strategy of keeping talented employees. Additionally, job characteristics have contributed on high intrinsic motivation along with high commitment by employees (Blankertz and Robinson, 1997), which in turn will reduce turnover intention. As stated by Dysvik and Kuvaas (2010), motivational holds an essential role in influencing employee's job turnover intention which leads to actual turnover. It is the reason why job characteristics aspect is one of the attribute that need to be concerned by management in relation to turnover intention (Samad, 2006).

Meanwhile, an earlier research examined by Udo et al., (1997) in manufacturing environment have found that task characteristics has given a strong both direct and indirect relationship towards intention to leave among technical personnel. Based on the study, researchers have tested a job involvement variable to identify an indirect effect between job characteristics and turnover intention. Findings revealed that a meaningful and satisfaction experience towards dimensions of feedback, autonomy along with task variety have led to lower turnover intention among plant managers. Thatcher, Liu, Stepina, Goodman and Treadway (2006) have tested 261 of Information Technology professional in United States regarding to turnover intention subject. Variables such as job characteristics, supervisory satisfaction, pay satisfaction and intrinsic motivation are predicted to influence affective organizational commitment, job satisfaction and turnover intention. Findings indicated that intrinsic motivation has a negative significant relationship effect with employee attitude on turnover intention.

Later, Elanain (2008) used a distributive justice as a mediator between relationship of job characteristics and turnover intention which as well emphasized on directly relationships. Findings showed that turnover intention can be influenced by job characteristics aspect by reducing turnover rate in United Arab Emirates context. Other work outcome variables such as job satisfaction and organizational commitment have a positive relationship with job characteristics particularly in skill variety, task identity, job feedback and task significance.

The theoretical framework for this paper is as follows.

Independent Variable (IV)   **Dependent Variable**
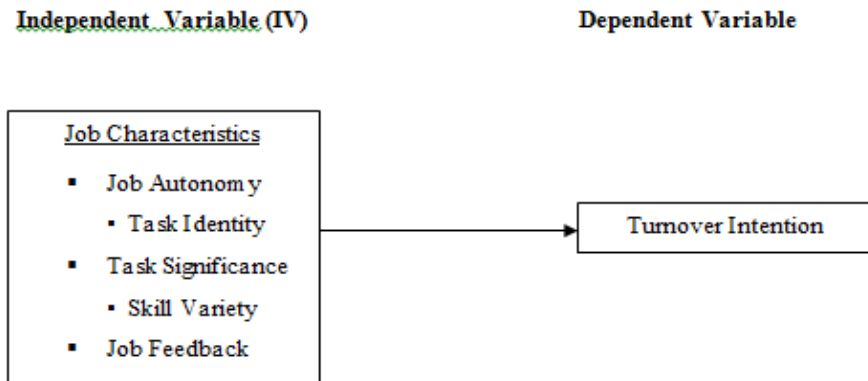
There is a relationship between job characteristics and turnover intention. The hypothesis seeks to examine the relationships between dimensions of job characteristics on employee's turnover intention.

H1: Job characteristic significantly correlates with turnover intention.

H1.1: Job autonomy significantly correlates with turnover intention.

H1.2: Skill variety significantly correlates with turnover intention.

H1.3: Task identity significantly correlates with turnover intention.

H1.4: Task significance significantly correlates with turnover intention.

H1.5: Job feedback significantly correlates with turnover intention.

METHODOLOGY

This research had adopted a quantitative approached by using structured set of questionnaires. The research conducted was based on field study and it was in a non-contrived setting which means this research has engaged with the natural environment. There were two phases involved in data collection which are: (1) pilot study for examining the reliability and validity of instruments adopted while (2) main study which using the revised instrument to examine the relationships among variables. The unit of analysis for this study is individual operator in manufacturing companies. Based on data reported by MOHR (2010), there were about 302,925 of operator's population in Peninsular Malaysia. Meanwhile, the E&E sub-sector of manufacturing was chosen to be the scope for this study due to the significance contribution to Malaysian economic (Economic Report, 2010). The interest on E&E sub-sector is highlighted instead of the other sectors because of E&E sub-sector is recorded as the highest contributor on employee's turnover since year 2008 until 2010 as showed in the table below.

Table 1.2

Statistics of Employee Turnover based on Manufacturing Sub-sector from Year 2008 to 2010

Manufacturing Sub-sector	No. of Turnover
Food products	1,309
Beverages & tobacco products	116
Textiles	5,651
Leather products	54
Wood products	1,693
Paper, printing & publishing products	361
Chemicals & chemicals products	445
Furniture products	662
Petroleum products	32
Rubber & plastics product	3,928
Non-metallic mineral products	915
Basic mental products	637
Fabricated metal products	1,128
Machinery & equipments	769
Electronics & electrical products	**12,231**
Transport equipments products	1,234
Basic pharmaceutical products & pharmaceutical preparations	10
Electricity, gas, steam & air conditioning supply	12
Other sub-sector	5,195
Total	**36.392**

Source: Report from Labour Department of Peninsular Malaysia (2010).Ministry of Human Resource Malaysia.

The agregate distribution of all the operators based on states were as follows.

Table 1.3

Operator Population

State	No. Of Operators
Selangor	78,583
Johor	61,085
Penang	42,122
Perak	31,668
Kedah	22,381
Melaka	19,054
Negeri Sembilan	18,633
Kuala Lumpur	13,344
Pahang	8205
Kelantan	4027
Terengganu	2977
Perlis	846
Total	**302,925**

Source: Labour Department of Peninsular Malaysia (2010). Ministry of Human Resource Malaysia.

The sample chosen is based on the table provided by Krejcie and Morgan (1970) (as in Sekaran and Bougie, 2010) that generalized scientific guidelines for the sample size

decisions. Based on Table 1.3 384 out of 302,925 operators are needed as the sample in the study. However, this study had distributed 800 sets of questionnaires to the respondents. The cronbach alpha for the reliability test is 0.83.

FINDINGS

There were seventeen of electrical and electronics manufacturing companies that are involved with data collection activity. Based on respondent's feedback, a total of 645 sets of fully answered questionnaires were received. The information related to the distribution of questionnaires is summarized in the Table 1.4 below.

Table 1.4 : Response Rate

Item	No of Questionnaire Sets
Total questionnaires distributed	800
Questionnaires returned	770
Incomplete questionnaires	125
Usable questionnaires	645
Response rate	81%

The characteristics of respondents according to their demographic profile. From the 645 respondents that were selected in this study, 32.1 percent were male and 67.9 percent were female. Most of them were aged 32 years old and above (39.4%), followed by the age category of 24 to 27 years (21.6%), 28 to 31 years (17.9%), 20 to 23 years (17.5) and lastly from 16 to 19 years old (3.6%). The majority of respondents were Malay (85.3%) followed by Indians (7.8%), Chinese (6.5%) and others (0.5%) respectively.

Table 1.5
Respondent's background

Background of the Respondents

Demographic	Frequency (n)	Percentage (%)
Gender		
Male	207	32.1
Female	438	67.9
Age		
16 to19	23	3.6
20 to 23	113	17.5
24 to 27	139	21.6
28 to 31	115	17.9
32 and above	254	39.4
Ethnic		
Malay	550	85.3
Chinese	42	6.5
Indian	50	7.8
Others	3	.5
Marital Status		
Single	261	40.5
Married	371	57.5
Others	13	2.0
Length of Service		
Below 1 year	83	12.9
1 to 3 years	154	23.9
4 to 6 years	129	20.0
7 years and above	279	43.3
Education Level		
No formal Education	2	.3
Primary	51	7.9
Secondary	540	83.7
Others	52	8.1

It is found that respondent's perceived of their job characteristics were moderate agreement, with overall mean was above average (mean=3.55, sd=0.44) and most of respondents agreed with statements in this variable. Table 1.6 shows the descriptive score on the level of job characteristics.

Table 1.6

Level of job characteristics

Level of Job Characteristics

Variable/Dimension	Mean	sd	Level
Job Characteristic	3.55	0.44	Moderate
Job Autonomy	3.35	0.66	Moderate
Task Identity	3.66	0.57	Moderate
Sill Variety	3.46	0.67	Moderate
Task Significance	3.56	0.64	Moderate
Job Feedback	3.74	0.57	Moderate

Whereas the overall perceptions on turnover intention were below average (mean=2.90, sd=1.04) and suggested that the respondents are not willing to quit from their current job. Table 1.7 shows that the descriptive score on the perception level on turnover intention.

Table 1.7

Perception towards turnover intention

Perception towards Turnover Intention

Variable/Item	Percentage (%)					Mean	sd	Level
	1	2	3	4	5			
Turnover Intention						2.90	1.04	Moderate
Think to leave the current job	10.2	20.0	39.5	16.6	13.6	3.03	1.15	Moderate
Looking for a new job by next year.	8.7	24.7	33.6	20.6	12.4	3.03	1.14	Moderate
Leaving the organization as soon as possible	16.6	37.5	23.1	11.5	11.3	2.63	1.21	Moderate

Based on the hypothesis developed:-

H1: Job characteristic significantly correlates with turnover intention
   H1.1: Job autonomy significantly correlates with turnover intention.
   H1.2: Task variety significantly correlates with turnover intention.
   H1.3: Significant significantly correlates with turnover intention.
   H1.4: Task significance significantly correlates with turnover intention.
   H1.5: Job feedback significantly correlates with turnover intention

A Summary of Results of Hypotheses Testing

Hypothesis	Description	Outcome
H1	**Job characteristic factors significantly correlates turnover intention**	Rejected
H1.1	Job autonomy significantly correlates turnover intention	**Accepted**
H1.2	Skill variety significantly correlates turnover intention	**Accepted**
H1.3	Task identity significantly correlates turnover intention	Rejected
H1.4	Task significance significantly correlates turnover intention	
H1.5	Job feedback significantly correlates turnover intention	**Accepted**

Findings from this study have contributed to the literature of directly relationships between job characteristics and turnover intention in Malaysia manufacturing industry. As stated in Table 5.1, the findings of correlation analysis revealed that operators that are experienced with meaningful task identity and job feedback dimensions in job characteristics have low tendency on intention to turnover from organizations. Meanwhile, dimension of skill variety is found to be positively influenced to turnover intention. Hence, there were only three of dimensions in job characteristics that have significant relationships on turnover intention. Contrary, the other two dimensions of job characteristics namely job autonomy and task significance found to be no significant in influencing employee's turnover intention.

Dimension of task identity has influenced directly on turnover intention in a negative relationship. It can be describe that through a meaningful and completeness of the task given, the operator's intention to quit becomes low. This finding shows consistency with the study conducted by Samad (2006) among Malaysian information technology professionals and also along with Elanain's (2008) study in Dubai environment. Hence, a meaningful task identity is adequate to provide some reduction in turnover intention among manufacturing operators. The importance of job feedback among manufacturing operators is shown as the response from the upper level is demanded by operators on how well they did perform for their work. Job feedback has shown as an important characteristic as task identity to reduce turnover intention. A directly negative relationship between feedback provided by management and operator's turnover intention has taken place in manufacturing environment. This result also has supported findings in other environment. According to Moorshegian (2010), feedback aspect has significant contribution to the both of direct and indirect relationship towards intention to leave in education setting.

Next, dimension of skill variety is needed to perform operator's task such as in managing several of machinery and equipment. However, based on the findings, operators who are required to perform a high variety in task and skills will reflect in high turnover intention. As in the work of Lefkowitz (1970), a high range of task and skills involved has influenced the tendency to quit as operators have exposed with little knowledge and incapable to perform various responsibilities. Furthermore, there were two dimensions of job characteristics that have been found to be no significant effect towards turnover intention (job autonomy and task significance). The dimension of job autonomy is

perceived as irrelevance to be described in operator's job context. It can be some reasons such as this type of job category is classified as a lower level in management hierarchy, thus the autonomy aspect is not provided for operator's to perform daily routine. Thus, the operators have no concern in learning new things as long as they can maintain their current job (Schak, 1997). It is because the job is rigid with written procedures and rules stated by companies as well comply with repetitive routine in task. Hence, the operator's perception and attitude towards job autonomy characteristic is worthlessness. The findings also parallel with a study conducted by Song et al., (2010) among teachers and administrators. Task significance dimension reflects no significant influence on turnover intention for this study. The results can explain through a nature of operator's job that engaged with machinery and equipments and less on human being relation. Most of the tasks required are depending on the condition of the machinery and recurring activities. Therefore, operators were perceived their job has no relevant on job significance dimension. This finding also is in line with study outcomes by Moorshegian (2010).

Lastly, the effect of aggregate for job characteristic variable and turnover intention variable is identified through the evaluation of simultaneous effects of all predictors studied. According to multiple regressions testing in previous chapter, there were about 14.3 percent of job characteristics factor have given a significant contribution to turnover intention. Based on the Table 5.1, the contribution can be explained through the combination of skill variety, task identity and feedback. These three variables also have a significance relationship on turnover intention

CONCLUSION

The purpose of this study is to identify variables that may predict operator turnover intention toward their manufacturing companies. The findings have provided perceptiveness to some prediction factors that have significant effects in explaining operator's turnover intention in Malaysian manufacturing context. Findings showed that job characteristics has significant correlation with turnover intention. Dimensions of task identity, skill variety and job feedback have contributed to turnover intention. In general, the study has provided some information to understand the issue of turnover intention among manufacturing operators. Practically, the findings may contribute in assisting management people and companies leaders in formulating more efficient strategies to minimize turnover number among operators for the benefit and survival of the unions.
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REFERENCE

Ambrose, M. L., & Kulik, C. T. (1999). Old friends, new faces: Motivation research in the 1990's. *Journal of Management*, 231-292.

Awamleh, R. (2007). The impact of the core job dimensions on satisfaction and performance: A test in an international environment. *International Business & Economics Research Journal*, 69-76.

.

Blankertz, L. E., & Robinson, S. E. (1997). Turnover intentions of community mental health workers in Psychosocial Rehabilitation Services. Community Mental Health Journal, 517-529.

Boonzaier, B., Ficker, B., & Rust, B. (2001). A review of research on the Job Characteristics Model and the attendant job diagnostic survey. South Africa Journal of Business Management, 11-34.

Chu, L. C., & Lai, C. C. (2011). A research on the influence of leadership style and job characteristics on job performance among accountants of Countyand City Government in Taiwan. Public Personnel Management, 101-118.
.
Dodd, N. G. (1987). The interaction of autonomy, variety, and feedback to predict satisfaction and performance: A laboratory experiment. Lincoln: A Bell and Howell Company.

Dodd, N. G., & Ganster, D. C. (1996). The interactive effects of variety, autonomy, and feedback on attitudes and performance. Journal of Organizational Behavior, 327-347.

Dore, T. L. (2004). The relationships between job characteristics, job satisfaction, and turnover intention among software developers. Doctoral Dissertation, Argosy University-Orange County.
Dysvik, A., & Kuvaas, B. (2010). Exploring the relative and combined influence of mastery-approach goals and work intrinsic motivation on employee turnover intention. Personnel Review, 622-638.

Elanain, H. M. (2008). Job characteristics, work attitudes and behaviors in a non-western context: Distributive justice as a mediator. Journal of Management Development, 457-477.

Foreman, W. T. (2009). Job satisfaction and turnover in the Chinese retail industry. Chinese Management Studies, 356-378.
.
Hackman, J. R., & Oldham, G. R. (1974). The job diagnostic survey: An instrument for the diagnosis of jobs and the evaluation of job redesign projects. United States of America: Yale University.

Hasin, H. H., & Omar, N. H. (2007). An empirical study on job satisfaction, job-related stress and intention to leave among audit staff in public accounting firms in Melaka. Journal of Financial Reporting & Accounting, 21-39.

Hodgetts, R. M. (1991). Organizational behaviour: Theory and practice. New York: Macmillan.

Lawler, E. J. (2001). An affect Theory of Social Exchange. The American Journal of Sociology, 321-352.

Lefkowitz, J. (1970). Effect of training on the productivity and tenure of sewing machine operators. Journal of Applied Psychology, 81-86.

Mobley, W. H. (1982). Employee Turnover. United States of America: Addison-Wesley Publishing Company.

Mooshegian, S. E. (2010). An Intervention-based Model of student retention in adult learners: Factors predicting intention to consider leaving or staying. Doctoral Dissertation, Saint Louis University.

Parker, S. K., Wall, T. D., & Cordery, J. L. (2001). Future work design research and practice: Towards an elaborated Model of Work Design. Journal of Occupational and Organizational Psychology, 413-440.

Robbins, S. P. (1993). Organizational Behavior: Concepts, Controversies, and Applications (6th ed.). New Jersey: Prentice Hall.

Samad, S. (2006). The contribution of demographic variables: Job characteristics and job satisfaction on turnover intention. Journal of International Management Studies, 1-12.
Samad, S. (2011). The effects of job satisfaction on organizational commitment and job performance relationship: A case of managers in Malaysia's manufacturing companies. European Journal of Social Sciences, 602-611.

Schak, D. C. (1997). Taiwanese labour management in China. Employee Relations, 365-373.
.
Sekaran, U., & Bougie, R. (2010). Research Methods for Business: A Skill Building Approach. United Kingdom: Wiley Publication.

Slocum, J. W. (1981). Job redesign: Improving the quality of work life. Journal of Experiential Learning and Simulation, 17-36.

Thatcher, J. B., Liu, Y., Stepina, L. P., Goodman, J. M., & Treadway, D. C. (2006). IT worker turnover: An empirical examination of intrinsic motivation. The DATA BASE for Advances in Information Systems, 133-146.

Udo, G. J., Gulmaraes, T., & Igbaria, M. (1999). An investigation of the antecedents of turnover intention for manufacturing plant managers. International Journal of Operations & Production Management, 912-930.

Zhang, Z. & Sharifi, H. (2000). A methodology for achieving agility in manufacturing organizations. International Journal of Operations & Production Management, Vol. 20 No. 4, pp. 496-512.