

Relationship of the Herzberg's Dual Factor Theory with Job Satisfaction and Motivation of Science Teachers

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Abstract

The study was conducted on the implications of Herzberg's two-factor theory on the job satisfaction of high school science teachers of district Rawalpindi, Pakistan. It explored the effect of the influence of Herzberg's motivational factors and hygiene factors on the job satisfaction of science teachers and the effect of each sub-factor on their job satisfaction. The relationship of sub-factors with respect to gender and area was also explored in this study. The sample of the study was 142 male science teachers and 211 female science teachers teaching class 6th to 10th grades, who were selected through stratified random sampling. The findings revealed that motivational factors were the dominant motivators of teachers' job satisfaction than hygiene factors, there is a substantial difference among job satisfaction levels of male and female teachers and the motivational factors had more effect on the job satisfaction of female science teachers than male science teachers. It was also found that there was a significant difference in motivation and hygiene factors on job satisfaction of the teachers of urban and rural areas. The salary and relationship with the supervisor are such hygiene factors that have no effect on the job satisfaction of science teachers whereas, motivational factors such as job security and recognition are found having the highest effect on job satisfaction of science teachers.

Keywords: job satisfaction, Herzberg theory, motivational factors, hygiene factors, science teachers

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Introduction

The most vital of the dynamics driving humans to realize their goals is motivation. It is frequently labeled as intrinsic or extrinsic in nature. Contrary to extrinsic, intrinsic motivation is considered to exist when an action is executed for one's own benefit rather than to acquire physical or communal rewards (Deci & Ryan, 2012). Herzberg, Mausner, and Snyderman (1959) were of the view that the dynamics of job satisfaction are different from those of job dissatisfaction. Herzberg concluded that there are two reasons for job satisfaction: motivation and hygiene factors. Motivation factors are such that generate job satisfaction, it includes recognition, achievement, autonomy, and other intrinsic features (Cetin, 2006). These factors also influence the ways of work; for an instance, assigning responsibility to perform a tough assignment in an organization given that the person with the necessary state of affairs will lead to evolution and improvement to advanced level tasks. The hygiene factors generate an appropriate work milieu though may not upsurge in satisfaction (Din, 2008). Hygiene aspects are critical to ensure that the working conditions may not grow into an unsatisfactory state. Distinctive hygiene features (also known as external/extrinsic features) are wages, conditions at work, status, organization policies, and management (Saiyadain, 2009). Thus, motivation features are relevant to the content of the job, and hygiene features are relevant to the job milieu.

Similar to other jobs, in the teaching and learning systems, equilibrium is maintained between the achievement of the teachers and their pledge to their job. Teachers' motivations are related to their approaches towards their job, their aspiration to play a part in the teaching process, and their concern about classroom control and discipline (Aacha, 2010; Bennell, 2004). In addition, teachers have motivation and hygiene (internal and external) needs. In other words, a motivated teacher assumes a sense of task satisfaction in order to achieve a sense of accomplishment and self-realization. Conversely, active teachers may perform their duties to gain rewards such as remuneration. Both of these factors affect the teacher's behavior (Bufquin, DiPietro, Orłowski, & Partlow, 2017).

In this regard, highlighting what motivates the teachers, detecting the factors that will root their turnover intention, and concluding how teachers can be motivated to retain within the organization is essential to be successful in the competitive market. Contemporary inquiries into the topic are likely to sustain the opinion that motivation springs from inside, and each human being has his own set of inspirations (Adams, 2007). However, these mutual origins of power are important, and managers have the responsibility to prudently detect and deal with these power springs to accomplish the goals of individuals and organizations.

The present research explores the relation of Herzberg's motivational features and job satisfaction of science teachers, and the relationship of hygiene factors and job satisfaction of science teachers. It also determines the effects of motivation and hygiene factors on job satisfaction of science teachers by gender and area. This study may provide information to the policy makers with sort of measures to be taken to promote science teachers' job satisfaction and motivation. It may help for the awareness of those factors that effect the job satisfaction of science teachers and their motivation. Science teachers' job satisfaction and motivation by offering a clear picture of activities carried out in educational institutions might reassure investigators who have curiosity in the interrelated issues, they may study this research as reference material for further research.

In Maslow's theory, he specified that it is essential to fulfilling the lower order necessities on priority, then advanced order desires of individuals be fulfilled (Schultz & Schultz, 1998). Alderfer's Existence-Relatedness-Growth (ERG) theory has given the extension to Maslow's theory with three basic essentials: "existence (physical survival needs), relatedness (social needs), and growth (personal growth and development needs)". This theory explains that there can be more desires operational at one time, such desires arise in a continuous sequence instead of a hierarchy. Maslow believed that to fulfill a need a person will persist to that need. But according to Alderfer (1969), a more basic need that an individual will sacrifice such a need improvises and refocuses. For example, at school, if teachers do not receive emotional support or recognition (relatedness desires), as compensation they plea for higher salary or improved health attention treatment (being needed) on the job (Schultz & Schultz, 1998; Ryan & Peterson, 2007). According to McGregor (2006), Theory X supervisors tolerate laziness and usually, they do not cooperate and like to give instructions. Theory Y supervisors, by contrast, are personally involved in encouraging jobs and exercise for accomplishing objectives. In 1967 the learned need theory was proposed by McClelland (1988) in his writings "The Achieving Society". McClelland documented three forms of desires for motivation i.e., the desire for an association, the desire for power, and the desire for accomplishment. McClelland proposed that motivated people attain a certain characteristic (Hoy & Miskel, 2001).

In 1959, a social researcher Frederick Herzberg, presented a theory on motivation and hygiene which was later referred to as the two-factor theory having both practical and theoretical implications (Falkenburg & Schyns, 2007). From practical perception, this theory is appropriate for every organization, and from the theoretical perception it has

resemblances with other need-based theories like Maslow's theory. Two-factor theory of Herzberg's states that the nature of job motivation originates itself and it arises through rewards. At hand are diverse factors that are central to job satisfaction and dissatisfaction (Hoy & Miskel, 2001). According to Herzberg, internal factors are linked to the satisfaction of employees who are satisfied at work, while employees who are not satisfied linked their sadness to external factors.

Herzberg described the significance of hygiene factors and described them as necessary for the employee's motivation. Although these factors do not contribute towards long-term motivation, the lack of these factors leads in the direction of dissatisfaction among employees. In other words, hygiene factors avoid the employees from dissatisfaction. These factors are extrinsic to the working environment and are also mentioned as dissatisfaction preservation factors (Alrawahi, Sellegren, Altouby, Alwahaibi & Brommels, 2020). These factors indicate the physiological needs of the employees, which are expected obligatory at the workplace. The motivation factors are those factors that lift the individuals for better performance and accomplishment of aims. These factors are mentioned as satisfiers and represent the psychological needs of the employees. These factors embraced additional benefits which are required by the employees from their organization and those organizations are capable to provide all these demands as well as can satisfy their workers (Noble, 2008).

Herzberg narrated the intrinsic factors such as recognition, achievement, responsibility, the work itself, advancement. And growth. According to him the lack of these factors doesn't generate dissatisfaction but the presence can boost the level of motivation among workers (Carmeli, Halevy & Weishberg, 2007). Herzberg recommended the extrinsic factor; working conditions, the salary of workers, the behavior of co-workers, Company policies, status and individual lives of the staff, and job security (Herzberg et al., 1959; Herzberg, 1968). He commented that although these extrinsic factors are not satisfied the lack of these factors leads on the way to dissatisfaction.

Herzberg's theory was criticized by different authors. Some scholars pointed out that the scaling used was biased as it comprised of a semi-structured interview (Jong & Jung, 2015; French, Metersky, Thaler, & Trexler 2006). On the other hand, some researchers criticized the oversimplified nature of theory and they believed that the theory was not supported by empirical pieces of evidence on the job satisfaction of the workers (Graham & Messner, 1998; Hulin & Smith, 1967; King, 1970; Ryan & Deci, 2000).

Teachers who have highly gratified desires may produce an upright psychosomatic and physical environment in their classrooms. Such

teachers with high motivation can integrate their personal knowledge, professional knowledge, and intrapersonal knowledge (Ololube, 2006). At the workplace, numerous aspects may have a vital part in arising their enthusiasm and job fulfillment of personnel. There are numerous researchers who considered a harmonizing association of these binary variables (Evans, 2001).

Job Satisfaction and Dissatisfaction:

Job satisfaction is an approach, which is the result of equilibrium, and numerous specific pleasures, and displeasures are associated with the profession. An estimation of job satisfaction may well base typically upon one's achievement or none-achievement in the completion of distinct goals and upon the apparent aids of the task and engaging institutions to these ends (Rasheed, Humayon, Awan and Ahmed, 2016). Sony & Mekoth (2016) define job satisfaction as a set of favorable and unfavorable conditions that workers interpret in their efforts. The better working situation at school gives satisfaction to teachers. They are pleased with a better salary, strong educational organizations where they can enhance their professional development, less workload, and strong supervision support (Izvercian, Potra & Ivascu, 2016).

Reward and recognition also exert an influence on the job satisfaction and inspiration for educators so educational organization determines the balance between the job commitment. And performance of teachers. When a worker achieves a financial reward with extraordinary pleasure and anticipation, that experience becomes more fabulous for that employee (Wang & Liesveld, 2015). There is a direct relation between types and nature of rewards with the motivation and satisfaction of the workers. Fluctuations in recompenses and acknowledgments can fetch a certain modification in stimulus and fulfillment for the job (Ali & Ahmed, 2009). Inborn rewards and outside rewards are frequently associated. Nevertheless, if the salary of teachers is not better, there cannot be a straight connection between the satisfaction of the teachers and their enthusiasm for the job. So, when there are no extrinsic rewards there is no worth of intrinsic rewards like acknowledgments, appreciations, and endorsements (Hafiza, Shah, Jamsheed, & Zaman, et al., 2011).

Previous studies found that there exists a strong relationship between motivation and job satisfaction and motivation has a key role in the satisfaction of individuals. Baah and Amoako (2011) said that different factors of motivation have great influence on job satisfaction level and can enhance the performance of workers. Horwitz, Heng, & Quazi (2003), Spector (2008), Sell and Bryan (2011), Lane, Esser, Holte, and Anne (2010), Rao (2005), Velnampy (2008) and, Bakotic and Babic (2013) found that healthy working environment and appreciation by the top

management can enhance the level of motivation of workers. As per their findings, any change in the working environment leads to the change of level of satisfaction of workers, it may also make people feel enthused and committed towards their job and organization. Tan & Waheed (2011) found hygiene factors as the most substantial than motivators in their relationship with job satisfaction, where the environment was the main factor, followed by company policy, recognition, and salary respectively. Similarly, Herzberg's hygiene factors exhibited a minor but significant influence on the job satisfaction of workers (Sachau, 2007). Smerek & Peterson (2007) concluded that the job itself is a good predictor of Job satisfaction after adjusting for both own & work features. Crossman & Harris, (2006), concluded in their study of the educators in several categories of schools, that males reported a higher level of satisfaction than females from their jobs. Similarly, the results of the study of Kloep & Tarifa (1994) found that the job satisfaction of female teachers' was expressively better as compared to male teachers. Several scholars (Borg, Riding, & Falzon, 1991; Chan, Pan, and Lee (2004) have also studied teachers' feelings and emotions. Surprisingly, Borg et al. (1991) found that poor working conditions lead to dissatisfaction. A study of Turkish high school teacher groups showed that the hygiene and motivational aspects lead to deviations in job satisfaction equally (Atalic & Canturk, 2016). Even in a different cultural environment like Taiwan, this theory has been validated (Chu & Kuo, 2015). Another study on Filipino workers concluded that there are vivid gender differences because male executives stated that they take on more duties as compared to the female managers working on the same status (Hechanova, Alampay, and Franco, 2006). A similar study conducted on female graduates from the University of Wisconsin found that they were disgruntled due to the income inconsistency between genders (Singh, Zhang, Wan, and Fouad, 2018).

In ephemeral, most of the studies conferred above indicated that there were uncountable motivating factors which can be categorized as intrinsic factors i.e. better pays, better working environment, job security, devotion, appreciation, progress, professional growth, including workers into decision making, interactive affiliation, management, job policies, and extrinsic factors as rewards, certificates, and monetary encouragements such as pay, bonuses. But most of the studies we have discussed above were conducted outside of Pakistan. Additionally, the studies were either conducted in urban settings or in rural settings but not in both areas concurrently, as well as no study was conducted to inspect the motivation factors on males and females of both urban and rural areas of Rawalpindi district. The present study fills all these gaps.

Theoretical Framework

The present research was focused on testing hygiene-motivation factors and job satisfaction on science teachers. The research model explains that the core drive of this study is to identify how motivation and hygiene factors affect science teachers' job satisfaction. It is designed to recognize whether the hygiene factors or motivators affect the science teachers' job satisfaction the most. The Independent variable has two foremost facets, which are hygiene and motivators. Similarly, due to area and gender, the effects of motivation and hygiene factors on job satisfaction may or may not fluctuate. As female workers have to face gender discernments, so in various parts of the world they state lesser job satisfaction. Thus, the objectives of the study were to find out the relationship of Herzberg's motivational factors with job satisfaction of science teachers, the relationship of Hygiene factors with their job satisfaction, and also to determine the relationship between gender and area of respondents with the job satisfaction of science teachers.

Hypotheses

Based on the above discussion there were following hypotheses for this research:

- i. There was a significant positive relationship of Herzberg's motivational factors with job satisfaction of science teachers.
- ii. There was a significant positive relationship of Hygiene factors with job satisfaction of science teachers.
- iii. There was a significant difference of motivation and hygiene factors on job satisfaction of science teachers by gender.
- iv. There was a significant difference of motivation and hygiene factors on job satisfaction of science teachers of urban and rural areas.
- v. Any variation in hygiene and motivation factors may lead to variation in job satisfaction level.

Methodology

Participants

The sample of the study was 142 male science teachers and 211 female science teachers teaching class 6th to 10th grades for the session of 2020-2021 in Rawalpindi district, which had been selected through stratified random sampling.

Instruments

The Minnesota scale of job satisfaction (MSJS) was used, and its construct validity was also calculated in the light of Herzberg's two factor theory.

The first scale was consisted of demographic profile of the respondents, the second scale i.e. MSJS was divided into three sections, hygiene factors, motivation factors and job satisfaction factors. Hygiene factors' section was comprised of 16 items; motivation factors' section was comprised of 14 items whereas, job satisfaction factors section was comprised of 15 items. The items of MSJS scale were to be responded on the scale of very low, low, moderate, high and very high. The pilot study on 120 science teachers (male=68, female=52) determined the validity and reliability of the scale. The confirmatory factor analysis was done to measure the single factor structure of MSJS, the results showed that fit indices were all within the acceptable limit i.e., $\chi^2/df=2.03$; RMSEA = .083, RMSEA 89% CI [.057–.065]; CFI = .92; TLI = .93; IFI = .91; RFI = .90; SRMR = .067. The values of AVE= .50 and CR=.887 indicate evidence of construct validity. For the purpose to assess the reliability and accurateness of the measurement scale a reliability test was executed. Table.1 shows that the outcomes of Cronbach's coefficient alpha were agreeable (between 0.69 and 0.83), representing that a parallel concept is measurable by each item of the scale.

Table 1.
Reliability Tests on Cronbach's Coefficient Alpha

Factors Job Satisfaction	Items	Cronbach's alpha
Motivators		
Achievement	3	0.69
Advancement	2	0.70
Recognition	3	0.71
Policy	3	0.72
Security	3	0.76
Progression	3	0.71
Monetary Scale	8	0.83
Environment	2	0.80
Hygiene		
Relation with Peers	3	0.80
Salary Satisfaction	3	0.80
Relation with Administrator	3	0.74
Money Factor	2	0.83
Job	3	0.72
Job Satisfaction	4	0.75

Table 1 shows the values of reliability coefficient i.e Cronbach's Alpha of two major factors and their sub factors. It shows that mostly all values of Cronbach's alpha were within acceptable range.

Table 2.
Demographic Profile of Sampled Science Teachers

Respondents' Characteristics	Number	Percentage
Gender		
Males	142	40.00
Females	211	60.00
Area		
Urban	176	50.00
Rural	175	50.00
Marital status		
Married	286	81.0
Unmarried	67	19.0
Regional groups		
Potohari	306	86.7
Pathan	11	3.1
Punjabi	14	4.0
Urdu speaking	22	6.2

Table 2 shows the profile of respondents in terms of gender, area, marital status and regional groups

Table 3.
Relationship of Herzberg's Motivational Factors and Job Satisfaction of Science Teachers (n= 353)

Categories	Mean	S.D	R	P
Motivators	50.20	3.02	0.84	0.01
Job Satisfaction	41.03	5.08		

Table 3 shows scores of standard deviation of job satisfaction factors were more scattered than the scores of motivation factors. Which shows that there was significant difference of opinions related to job satisfaction among teachers. The value of $r = 0.84$ was greater than value of $p = 0.01$. The evidence was sufficient to conclude that there is a significant positive relationship of motivational factors and job satisfaction of science teachers.

Table 4.
Relationship of Hygiene Factors and Job Satisfaction of Science Teachers

Categories	Mean	S.D	R	P
Hygiene Factors	50.90	5.67	0.72	0.00
Job Satisfaction	41.03	5.08		

Table 4 shows hygiene factors were more scattered than the scores of job satisfaction. Similarly, there was significant difference of opinions related to hygiene factors among teachers of Rawalpindi district. The value of $r = 0.72$ was greater than value of $p = 0.00$, showed that there was positive linear relationship between hygiene factors and job satisfaction.

Table 5.
Multivariate Treats of Effect of Motivation and Hygiene Factors on Job Satisfaction of Science Teachers by Gender

Effects	Value	F	Hypothesis df	Error df
Intercept	0.998	48334.96	3.00	24.00
Gender	0.262	41.22		

Before using multivariate analysis of variance (MANOVA) Correlations were performed between variables which were found within moderate range, and MANOVA was appropriate to be used. It was used to test the hypothesis that there was a significant effect of motivation and hygiene factors on job satisfaction of teachers by gender. As we can see Pillal's Trace = 0.99, $F(3, 24)$, $P < 0.001$ is significant, F indicates that there is significant difference among gender groups (male and female) on the linear combination of three variables. The results show there is a significant effect of motivation and hygiene factors on job satisfaction of teachers by gender and this result is in favour of female science teachers, this means the motivational factors and hygiene factors have more effect on the job satisfaction of female science teachers of Rawalpindi district.

Table 6.
Multivariate Test of Difference of Motivation and Hygiene Factors on Job Satisfaction of Teachers of Urban and Rural Areas

Effects	Pillal's Trace	F	Hypothesis df	Error df
Intercept	0.99	107699.14	3.000	349.00
Area	0.86	743.87		

Table 6 represents the one-way MANOVA was used to test hypothesis that there was a significant difference of motivation and hygiene factors on job satisfaction of teachers of urban and rural areas. As Pillal's Trace = 0.99, F (3, 349), $P < 0.01$ is significant F indicates that there is significant difference among area groups (rural and urban) on the linear combination of three variables. The results show that there is a significant difference of motivation and hygiene factors on job satisfaction of science teachers of urban and rural areas and this result is in favour of urban teachers, this indicates the motivational factors and hygiene factors have more effect on the job satisfaction of urban science teachers of Rawalpindi district than the rural science teachers.

Table 7.
Results of SEM

Independent variables	Estimate	Significance
Motivators		
Achievement	0.654	***
Advancement	0.637	***
Recognition	0.712	***
Policy	0.691	***
Security	0.720	***
Progression	0.689	***
Monetary scale	0.692	***
Environment	0.645	***
Hygiene factors		
Work itself	0.315	***
Supervision	0.421	***
Salary	0.262	0.043
Relationship with peers	0.430	***
Relationship with administrators	0.032	0.013

Table 7 SEM was conducted to test hypothetical dependencies based on path analysis, in this research it was performed by using AMOS on the opinions of science teachers, which depict one-unit increase in achievement resulted in 0.654 units increase in job satisfaction, similarly one units increase in each i.e. advancement, recognition, policy, security, progression, monetary scale and environment resulted in 0.637, 0.712, 0.691, 0.720, 0.689, 0.692, 0.645 units increase in job satisfaction respectively. As far as hygiene factors are concerned one-unit increase in work itself leads to 0.315 units increase in job satisfaction, one-unit increase in supervision leads to 0.142 units increase in job satisfaction, one-unit increase in relationship with peers resulted in 0.430 units increase in job satisfaction. For salary and relationship with administrators the p-values for regressors are less than the level of significance ($p=0.05$), so salary and relationship with the supervisor are the such hygiene factors which have no effect on job satisfaction.

Discussion

This study was targeted to explore the impact of Herzberg's dual factor theory of job satisfaction and motivation among science teachers of high schools of Rawalpindi district. The results exposed a statistically momentous connection among intrinsic motivational factors (chances to get new skills, progress chances, sharing in decision making, self-sufficiency, recognition) and teacher job satisfaction. Likewise, a statistically momentous association is also found among hygiene factors (pay, job environment, connection with seniors, incentive, and response) and teacher job satisfaction. The research is an evidence to the concept that factors meeting the intrinsic needs of teachers provided higher job satisfaction. The satisfying factors in this research were achievement, recognition, and responsibility. The two most dissatisfying factors were (a) work itself and (b) administration relations which are extrinsic factors. The science teachers of urban and rural area of Rawalpindi both showed their job satisfaction on the scale of implementation of institution policies due to which they are getting benefits of leave promotions etc. However, science teacher job satisfaction is largely influenced by motivational factors, however, hygiene factors contribute less to science teacher job satisfaction, these outcomes are same as concluded by Horwitz et al. (2003), Spector (2008), Sell and Cleal (2011), Lane et al. (2010), Rao (2005), Velnampy (2008), Sashau (2007), Tan and Waheed (2011) and Bakotic and Babic (2013). The results showed high motivational level of female teacher as compared to male teachers, same as found by Kloep &

Tarifa (1994), whereas, more effect of hygiene factors on male teachers is seen as compare to female teachers of Rawalpindi district. Results showed that there is substantial difference among job satisfaction level of male and female teachers of Rawalpindi district, which contradict the results of study by Borg et al. (1991) and Chan et al. (2004), found female teachers much satisfied with their jobs as compared to male teachers. The outcomes showed more effect of hygiene and motivational factors on teachers of urban area as compare to teachers of rural area of Rawalpindi district, but job satisfaction level of urban teacher is higher than rural teachers. The results also indicated that there is significant difference among area groups (urban and rural), and the results are in favour of urban teachers, as the motivational factors and hygiene factors have more influence on the job satisfaction of urban science teachers of Rawalpindi district.

Conclusions

A positive relationship was also found between science teacher's motivation factors and job satisfaction as well as between hygiene factors. Promotion was also one of the major concerns of both male and female science teachers of rural and urban areas. The motivational factors and hygiene factors had effect on the job satisfaction of female science teachers of Rawalpindi district. The science teachers of urban high schools were found more satisfied with the physical environment of the schools as compare to rural high school teachers.

The bond of motivation and job satisfaction is not multifaceted. The dilemma is that many organizations yield the hygiene factors as means to encourage when, in fact, these factors have less contribution toward motivating workers. It is done because it just takes effort to raise wages than it does to reexamine organizational policies, and restructure jobs for maximum employee satisfaction. There is need to ensure it while assigning duties to science teachers beyond their job descriptions, they may not be affected by unnecessary bureaucracy.

Recommendations

Government may plan and implement clear policies, to develop criteria regarding contract period rules and permanence of job at the completion of the specified contract period may enhance job security and recognition of the efforts of science teachers. Educational policy maker may implement detailed job description that teachers may only perform their teaching duties, and they might not be forced by management to complete

tasks other than teaching. There might be provision of all basic facilities such as electricity, healthy drinking water, clean and spacious rooms for teaching, daycares for children of working mothers teaching in school, and transport facility. By satisfying teachers' basic needs, their motivation, as well as job satisfaction can be enhanced. Schools can cultivate sets of assets termed Parents for Healthy Schools to support institutions and institution groups e.g., parent-teacher associations (PTA), parent-teacher organizations (PTO), school-wellness committees (SWC) may involve parents to craft vigorous school milieus.

According to the finding of the study, research is needed to recognize the interactions between science teacher motivation and student motivation. Among science teacher's motivation and student enactment, and concerning school quality and teacher motivation. The concept of science teacher's motivation can also be studied in relation to educational outcomes.

Research is also needed in the area of professional development to see whether the professional development programs for science teachers are contributing positively to the overall motivation and job satisfaction of science teachers and whether the subject for which an instructor is trained to teach is a cultivated variable in the motivation levels of science teachers.

Further investigation can focus on administrative approaches which can be used to motivate teachers. Such studies may also be conducted in other areas of Pakistan. Similarly, relationship of other variables with job satisfaction may also be analyzed, research may also be conducted on the subjects of other teachers.

Conflict of Interest

It is stated here that there is no conflict of concerns nor any confession to report. It is an original research being submitted to the journal of Science Education.

References

- Aacha, M. (2010). Motivation and the performance of primary school teachers in Uganda: a case of Kimaanya - Kyabakuza Division, Masaka District, Uganda: Makerere University.
- Adams, J.A. (2007), *Managing people in organizations; Contemporary Theory and Practice*. UK: Macmillian
- Alderfer, C. P. (1969). An empirical test of a new theory of human needs. *behavior and human performance*, 4(2), 142-175. [https://doi.org/10.1016/0030-5073\(69\)90004-x](https://doi.org/10.1016/0030-5073(69)90004-x)
- Ali, R., & Ahmed, M. S. (2009). The impact of reward and recognition programs on employee's motivation and satisfaction: an empirical study. *International Review of Business research papers*, 5(4), 270-279. <https://citeseerx.ist.psu.edu/viewdoc/download>. <https://doi.org/10.1.1.472.8630&rep=rep1&type=pdf>
- Alrawahi, S., Sellegren, S. F., Altouby, S., Alwahaibi, N. & Brommels, M. (2020). The application of Herzberg's two-factor theory of motivation to job satisfaction in clinical laboratories in Omani hospitals, 6(9), e04829 <https://doi.org/10.1016/j.heliyon.2020.e04829>.
- Atalic, H. C., & Canturk, N. (2016). Herzberg's motivation-hygiene theory applied to high school teachers in Turkey. *European Journal of Multidisciplinary Studies*, 1(4), 90-97.
- Baah, K., & Amoako, G. K. (2011). Application of Frederick Herzberg's Two-Factor Theory in Assessing and Understanding Employee Motivation at Work: A Ghanaian Perspective. *European Journal of Business and Management*, 3(9), 1-8. <https://www.iiste.org/Journals/index.php/EJBM/article/view/642>
- Bakotic, D., & Babic, T. B. (2013). Relationship between Working Conditions and Job Satisfaction: The Case of Croatian Shipbuilding Company. *International Journal of Business and Social Science*, 4(2), 206-213. http://www.ijbssnet.com/journals/Vol_4_No_2_February_2013/22.pdf

- Bennell, P. (2004). *Teacher motivation and incentives in Sub-Saharan Africa and Asia*. Knowledge and Skills for Development Centre for International Education, Brighton: Sussex University.
- Borg, M.G., Riding, R.J. & Falzon, J.M. (1991). Stress in teaching: A study of Occupational stress and its determinants, job satisfaction and career commitment among primary school teachers. *Educational Psychology*, 11(1), 59-75.
- Bufquin, D., DiPietro, R., Orłowski, M., & Partlow, C. (2017). The influence of restaurant co-workers' perceived warmth and competence on employees' turnover intentions: The mediating role of job attitudes. *International Journal of Hospitality Management*, 60 (Special Issue), 13-22.
- Carmeli, A., Halevy, M. Y. & Weishberg, J. (2007). The relationship between emotional intelligence and psychological wellbeing. *Journal of Managerial Psychology*, 24(4), 66–78. <https://doi.org/10.1108/02683940910922546>
- Cetin, M.O. (2006). The relationship between job satisfaction, occupational and organizational commitment of academics. *The Journal of American Academy of Business, Cambridge*, 8(1), 78-88.
- Chan, M. J., Pan, Z. D., & Lee, L. F. F. (2004). Professional aspirations and job satisfaction: Chinese journalists at a time of change in the media. *Journalism and Mass Communication Quarterly*, 81(2). <https://doi.org/10.1177/107769900408100203>
- Chu, H. C., & Kuo, T. Y. (2015). Testing Herzberg's two-factor theory. *The Journal of Human Resource and Adult Learning*, 11(1), 54-65.
- Crossman, A., & Harris, P. (2006). Job satisfaction of secondary school teachers. *Educational Management Administration & Leadership*, 34(1), 29-46.
- Deci, E.L & Ryan, R.M. (2012). The “what” and “why” of goal pursuit; human needs and the self determination of behavior. *Psychological Inquiry*. 11(4), 227-268. https://doi.org/10.1207/S15327965PLI1104_01
- Din, M.N. (2008). A study of motivation techniques used by heads of institutions of higher education and their impact on the performance

of teachers. Rawalpindi: University Institute of Education and Research PMIS Arid Agriculture University.

Evans, D. (2001). *Supervisory management (3th ed.)*. London: Cassell Educational Ltd.

Falkenburg, K. & Schyns, B. (2007). Work satisfaction, organizational commitment and withdrawal behaviors. *Management Research News*, 30(10), 708-723.

French, E., Metersky, M., Thaler, D. & Trexler, J. (2006). Herzberg's two factor theory: Consistency versus method dependency. *Personnel Psychology*, 26, 369 - 375. <https://doi.org/10.1111/j.1744-6570.1973.tb01144.x>.

Graham, M.W. & Messner, P. E. (1998). Principals and job satisfaction. *The International Journal of Education Management*, 12(5), 196-203.

Hafiza, N.S., Shah, S.S, Jamsheed, H., & Zaman, K. (2011). Relationship between rewards and employee's Motivation in the non-profit organizations of Pakistan. *Business Intelligence Journal*, 4(2), 327-333.

Hechanova, R. M., Alampay, R. B., & Franco, E. P. (2006). Psychological empowerment, job satisfaction and performance among Filipino service workers. *Asian Journal of Social Psychology*, 9(1), 72-78.

Herzberg, F., Mausner, B., & Snyderman, B.B. (1959). *The motivation to work (2nd Ed)*. New York: John Wiley & Sons.

Herzberg, F. (1968). One more time: how do you motivate employees?" *Harvard Business Review*, 46 (1), 53–62.

Horwitz, M. F., Heng, T.C., & Quazi, A.H. (2003). Finders, Keepers? Attracting, motivating and retaining knowledge workers. *Human Resource Management Journal*, 13(4), 23- 44

Hoy, W.K., & Miskel, C.G. (2001). *Educational administration: theory, research, and practice (6th ed.)*. New York: McGraw-Hill.

- Hulin, C. L. & Smith, P.A. (1967). An empirical investigation of two implications of the two-factor theory of job satisfaction. *Journal of Applied Psychology*, 51(5p1),396.
- Izvercian, M., Potra, S., & Ivascu, L. (2016). Job Satisfaction Variables: A Grounded Theory Approach. *Social and Behavioral Sciences*, 221, 86-94.
- Jong, Y. O. & Jung, C. K. (2015). The Development of Interview Techniques in Language Studies: Facilitating the Researchers' Views on Interactive Encounters. *English Language Teaching*, 8 (7), 30-39.
- King, N. (1970). Clarification of the two-factor theory of job satisfaction. *Psychological Bulletin*, 74(1), 18-31.
- Kloep, M & Tarifa, F. (1994). Working conditions, work style and job satisfaction among Albanian teachers. *International Review of Education*, 40(2),159-172. <https://doi.org/10.2307/3444068>
- Lane, K., Esser, J., Holte, B., & Anne, M. M. (2010). A study of nurse faculty job satisfaction in community colleges in Florida. *Teaching and Learning in Nursing*, 5(1), 16-26. <https://doi.org/10.1016/j.teln.2009.05.001>
- McClelland, D. C. (1988). *Human Motivation*.UK: Cambridge University Press.
- McGregor, D. (2006). *The Human Side of Enterprise*. NY: McGraw-Hill.
- Noble, C. H. (2008). The influence of job security on field sales manager satisfaction: exploring frontline. *The Journal of Personal Selling and Sales Management*, 28 (3), 247-261.
- Ololube, N. P. (2006). Teachers Job Satisfaction and Motivation for School Effectiveness: An Assessment. *Essays in Education*. 18.
- Rao S. P. (2005). *Essential of HRM & Industrial Relationships*. Bombay: Discovery Publishing.
- Rasheed, M.I., Humayon, A.A., Awan, U. and Ahmed, A.U.D. (2016). Factors affecting teachers' motivation: An HRM challenge for public

sector higher educational institutions of Pakistan (HEIs). *International Journal of Educational Management*, 30 (1), 101-114. <https://doi.org/10.1108/IJEM-04-2014-0057>

Ryan E. S. & Peterson, M. (2007). Examining Herzberg's theory: improving job satisfaction among non-academic employees at a university. *Research in Higher Education*, 48(2), 229–250. <https://doi.org/10.1007/s11162-006-9042-3>

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist*, 55(1), 68–78. <https://doi.org/10.1037/0003-066X.55.1.68>

Saiyadain, M. (2009). *Human resources management*. McGraw-Hill.

Sachau, D. A. (2007). Resurrecting the motivation hygiene theory: Herzberg and the positive psychology movement. *Human Resource Development Review*, 6 (4), 377–393. <https://doi.org/10.1177/1534484307307546>

Schultz, D. P., & Schultz, S. E. (1998). *Psychology and work today: An Introduction to Industrial and Organisational Psychology*. Practice Hall, New Jersey.

Sell, L., & Cleal, B. (2011). Job satisfaction, work environment, and rewards: motivational theory revisited. *Labour*. 25(1), 1–23. <https://doi.org/10.1111/j.1467-9914.2010.00496.x>

Sony, M. & Mekoth, N. (2016). The relationship between emotional intelligence, frontline employee adaptability, job satisfaction and job performance. *Journal of Retailing and Consumer Services*, 30(3), 20–32. <https://doi.org/10.1016/j.jretconser.2015.12.003>

Singh, R.P., Zhang, Y., Wan, M.M., & Fouad, N.A. (2018). Why do women engineers leave the engineering profession? The roles of work–family conflict, occupational commitment, and perceived organizational support. *Human Resource Management*, 57, 901-914. <https://doi.org/10.1002/hrm.21900>.

- Smerek, R. & Peterson, M. (2007). Examining Herzberg's theory: improving job satisfaction among non-academic employees at a university. *Research in Higher Education*, 48, 229-250. <http://10.1007/s11162-006-9042-3>.
- Spector, P. (2008). *Industrial and organizational behaviour*. New Jersey: Wiley
- Tan, T. H., & Waheed, A. (2011). Herzberg's motivation-hygiene theory and job satisfaction in the Malaysian retail sector: The Mediating Effect of Love of Money. *Asian Academy of Management Journal*, 16(1), 73-94.
- Wang, Y., Liesveld, J. (2015). Exploring Job Satisfaction of Nursing Faculty: Theoretical Approaches. *Journal of Professional Nursing*, 31(6), 482-492. <https://doi.org/10.1016/j.profnurs.2015.04.010>.
- Velampy, T. (2008). Job attitude and employee's performance of public sector organizations in Jaffna District, Sri Lanka. *GITAM Journal of Management*, 6.

Citation of this Article:

Batool, S., Shahnawaz, M. & Habib, S (2022). Relationship of the Herzberg's dual factor theory with job satisfaction and motivation of science teachers. *Journal of Science Education*, 3(2), 41–60.