THE RELATIONSHIP BETWEEN SAFETY CLIMATE, SAFETY COMMUNICATION, AND WORK ENVIRONMENT WITH UNSAFE BEHAVIOUR AMONG CONSTRUCTION WORKERS

By

GHAZALI BIN ABD AZIZ

Dissertation Submitted to
Othman Yeop Abdullah Graduate School of Business,
Universiti Utara Malaysia,
in Partial Fulfillment of the Requirement for the
Master of Science (Occupational Safety and Health)

Pusat Pengajian Pengurusan Perniagaan
SCHOOL OF BUSINESS MANAGEMENT
Universiti Utara Malaysia

PERAKUAN KERJA KERTAS PROJEK
(Certification of Project Paper)

Saya, mengaku bertandatangan, memperakukan bahawa
(I, the undersigned, certified that)
GHAZALI BIN ABD. AZIZ (809066)

Calon untuk Ijazah Sarjana
(Candidate for the degree of)
MASTER OF SCIENCE (OCCUPATIONAL SAFETY AND HEALTH MANAGEMENT)

telah mengemukakan kertas projek yang bertajuk
(has presented his/her project paper of the following title)

THE RELATIONSHIP BETWEEN SAFETY CLIMATE, SAFETY COMMUNICATION, AND WORK ENVIRONMENT WITH UNSAFE BEHAVIOUR AMONG CONSTRUCTION WORKERS

Seperti yang tercatat di muka surat tajuk dan kulit kertas projek
(as it appears on the title page and front cover of the project paper)

Bahawa kertas projek tersebut boleh diterima dari segi bentuk serta kandungan dan meliputi bidang ilmu dengan memuaskan.
(that the project paper acceptable in the form and content and that a satisfactory knowledge of the field is covered by the project paper).

Nama Penyelia : **DR. NOR AZIMAH CHEW BINTI ABDULLAH**
(Name of Supervisor)

Tandatangan :
(Signature)

Tarikh : **30 APRIL 2018**
(Date)

PERMISSION TO USE

In presenting this project paper in partial fulfillment of the requirements for a Post Graduate degree from the Universiti Utara Malaysia (UUM), I agree that the Library of this university may make it freely available for inspection. I further agree that permission for copying this project paper in any manner, in whole or in part, for scholarly purposes may be granted by my supervisor(s) or in their absence, by the Dean of Othman Yeop Abdullah Graduate School of Business where I did my project paper. It is understood that any copying or publication or use of this project paper or parts thereof for financial gain shall not be allowed without my written permission. It is also understood that due recognition shall be given to me and to the UUM in any scholarly use which may be made of any material in my project paper.

Request for permission to copy or to make other use of materials in this project paper in whole or in part should be addressed to:

Dean of Othman Yeop Abdullah Graduate School of Business
Universiti Utara Malaysia
06010 UUM Sintok
Kedah Darul Aman

ABSTRACT

The primary objective of this research was to determine the relationship between safety climate, safety communication, and work environment with unsafe behaviour. A survey was carried out among construction workers in Selangor. A total of 112 construction workers became the respondents in this research. This research used structured questionnaire comprising of 41 questions to measure four main variables i.e. safety climate, safety communication, work environment and unsafe behaviour. In this research, all the variables were measured by 6-point Likert's scale. Analysis of the study was carried out through descriptive and multiple regression method. Data was analysed using IBM SPSS Statistics 21. The results showed all the three hypotheses were accepted. The implication of this study towards practical and future study is also discussed for the management of construction industry to provide a conducive working environment. Specifically, this research has important findings for safety policy implementation, rules and procedures in the construction industry practices. The empirical results of this research offered strategic direction to avoid workers unsafe behaviour while at work for a successful implementation of construction projects. This research had provided insight into factors affecting theoretical perspective for understanding unsafe behaviour research in the construction industry. Policy makers within the construction industry must be clear about the objectives of safety rules and procedures and they must be communicated effectively within the organization.

Keywords: Safety Climate, Safety Communication, Work Environment, Unsafe Behaviour

ABSTRAK

Objektif utama kaji selidik ini adalah untuk menentukan hubungan antara iklim keselamatan, komunikasi keselamatan, dan persekitaran kerja dengan tingkah laku yang tidak selamat. Satu tinjauan telah dijalankan di kalangan pekerja pembinaan di Selangor. Sejumlah 112 pekerja pembinaan menjadi responden dalam kajian ini. Kaji selidik ini menggunakan kaedah soal selidik berstruktur yang mengandungi 41 soalan untuk mengukur empat pembolehubah utama iaitu iklim keselamatan, komunikasi keselamatan, persekitaran kerja dan tingkah laku yang tidak selamat. Dalam kajian ini, semua pembolehubah diukur menggunakan skala Likert 6-poin. Analisis kajian dijalankan melalui kaedah deskriptif dan regresi berganda. Data dianalisis menggunakan Statistik SPSS IBM 21. Keputusan menunjukkan kesemua tiga hipotesis telah diterima. Implikasi kajian ini terhadap praktis dan masa depan telah juga dibincangkan iaitu pengurusan industri pembinaan haruslah menyediakan persekitaran kerja yang kondusif dan selamat. Secara khusus kaji selidik ini, memperolehi dapatan yang sangat penting untuk pelaksanaan dasar keselamatan, peraturan dan prosedur dalam amalan industri pembinaan. Keputusan empirikal kajian ini merupakan panduan ke arah yang strategik bagi memperbaiki tingkahlaku tidak selamat yang diamalkan oleh pekerja semasa projek pembinaan dilaksanakan. Kajian ini telah memberikan pandangan tentang faktor-faktor yang mempengaruhi perspektif teori untuk penyelidikan tingkah laku yang tidak selamat. Pembuat dasar dalam industri pembinaan mestilah jelas mengenai objektif peraturan dan prosedur keselamatan dan mesti dibinmcangkan secara terbuka dengan berkesan dalam organisasi.

Kata Kunci: iklim keselamatan, hubungan keselamatan, persekitaran kerja, tingkahlaku tidak selamat

ACKNOWLEDGEMENTS

First and foremost, I wish to convey my thanks to Dr. Nor Azimah Chew Abdullah for her concerned and advices in making the completion of the project paper a success.

My sincere thanks is extended to Mr Megat Kamil Azmi Megat Rus Kamarani, the Senior General Manager of the Construction Industry Development Board (CIDB) Malaysia for for providing a list of contractors in the State of Selangor.

Last but not least, a special thanks to my spouse Jamaliah Alias and my sons, Muhammad Fakhruddin and Muhamad Aqil for their patience and support throughout my studies at Univeriti Utara Malaysia.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

BNM	:	Bank Negara Malaysia
CIDB	:	Construction Industry Development Board
DOSH	:	Department of Safety and Health
ILO	:	International Labour Organization
NIOSH	:	National Institute of Safety and Health
NTT	:	Nusa Tenggara Timur
OSHA	:	Occupational Safety and Health Act
OSQ	:	Offshore Safety Questionnaire
SPSS	:	Statistical Package for the Social Science
UUM	:	Universiti Utara Malaysia

CHAPTER ONE
INTRODUCTION

1.1 Background of Study

Construction industry is one of the industries that is responsible in providing notable contributions to the development and growth of the country's economy including Malaysia. The success of a country is seen from the aspect of building infrastructure and other physical facilities. Therefore, the construction industry is closely related to the economic development of a country. According to Rahman (2012), the construction industry is the industry that carries out the construction of a building or infrastructure such as housing, commercial buildings, public utilities and roads. Construction industry is classified as one of the most hazardous industry in relation to fatal and non-fatal injuries. In comparison to early retirement of workers in the other industries, construction workers have the highest potential of retiring early due to health and musculoskeletal pain, thus losing valuable number of working days (ILO, 2017).

Minimising injury is difficult in an industry such as construction where the nature of work is labour intensive and work activities always changing. To adopt changes in the working environment, it involved wide range of changes in safety behaviour because of the nature of work, how it is conducted and the requirement to cater for potential imperative competition with customer demands and meeting the date line. This is further worse due to workers negative attitude and their behaviour towards safety (Choudhry & Fang, 2008).

The contents of the thesis is for internal user only

REFERENCES

Abdul, R. A., Muhd, Z. A. M., and Bachan, S. (2008). Causes of accidents at construction sites. Malaysian Journal of Civil Engineering, 20(2), 242-259.

Alicia, C. C. (2009). An examination of the Human Factors Attitudes and Knowledge of Surface Warfare Officers. Master of Science in Human System Integration Naval Postgraduate School, Monterey, California.

Alsamadani, R., Hallowell, M. R., Javvennick-Will, A. and Cabello, J. (2013). Relationships among language proficiency, communication patterns, and safety performance in small work crews in the United States. Journal of Construction Engineering and Management, 13(9), 1125-1134.

Anderson, D. R., Sweeney, D. J., & William, T. A. (2002). *Statistics for business and economics* (8thed.). Cincinnati, OH: South-Western.

Arfena D. L., Jaswar, K., & Kader, A. S. A. (2014). Contribution of Human Factor to Shipping Safety. *Jurnal Teknologi*, 66(2), 113-119.

Babbie, E. (1990). *Survey research methods* (2nded.). Belmont, Calif.: Wadsworth.

Barling, J., Loughlin, C., Kelloway, E. K., (2002). Development and Test of a Model Linking Safety-Specific Transformational Leadership and occupational safety. *Journal of Applied Psychology*, 87(3), 488-496.

Bank Negara Malaysia (BNM) Annual Report 2017

Bartram, D., Robertson, I. T. & Callinan, M. (2002). Introduction: A framework for examining organizational effectiveness. In *Organizational Effectiveness: The Role of Psychology,* edited by I. T. Robertson, M. Callinan & D. Bartram. 1-10. Chichester, UK, Wiley.

Berek, N. C., Suwandi, T. & Purnomo, W. (2017). Internal factors that influence unsafe acts on construction employees. *International Journal of Researchers*, 2(3), 57-61.

Beus, J. M., Payne, S. C., Bergman, M. E. & Arthur, W. (2010). Safety climate and injuries: An examination of theoretical and empirical relationship. *Journal of Applied Psychology*, 95(4), 713-727.

Bjerkan, A. M., (2010). Health, environment, safety culture and climate-analyzing the relationships to occupational accidents. *Journal of Risk Research*, 13(4), 445-477.

Bradley, G. (1997). Safe people safe places: Psychological contributions to industrial accident prevention. *Journal of Applied Social Behaviour*, 2, 1-14.

Brislin, R. W. (1970). Back-translation for cross-cultural research. *Journal of Cross-Cultural Psychology*, 1(3) 185-216.

Buehler, M., Werna, E., & Brown, M. (2017). *World Economic Forum*. More than 2 million people die at work each year. Here's how to prevent it.

Chau, N., Bourgkard, E., Bhattacherjee, A., Ravaud, J. F., Choquet, M., and Mur, J. M. (2008). Associations of job, living conditions and lifestyle with occupational injury in working population-based study. *International Arch Occup Environ Health*, 81, 379-389.

Chi, S., Han, S., Asche, & Kim, D.Y. (2013). Relationship between unsafe working conditions and employees' behaviour and impact of working conditions on injury severity in U.S. construction industry. *Journal Construction Engineering Management,* 139, 826-838.

Chomeya, R. (2010). Quality of psychology test between likert scale 5 and 6 points. *Journal of Socila Sciences*, 6(3), 399-403.

Choudhry, R. M., & Fang, D. (2008). Why operatives engage in unsafe work behaviour: Investigating factors on construction sites. *Safety Science*, 46(4), 566-584.

Christoffel, & Gallagher, S. S. 2006), *Injury Prevention and Public Health: Practical Knowledge, Skills, and Strategies*. Jones & Bartlett Learning.

CIDB Malaysia: Main statistics on construction projects awarded as of March 2017. Retrieved March 15, 2018 from http://www.cidb.gov.my/images/content/pdf/statistik/Web-Mac.-2017.pdf.

Cigularov, K. P., Chen, P. Y. & Rosecrance, J. (2010). The effects of error management climate and safety communication on safety: a multi-level study. *Accident Analysis Preview*, 42(5), 1498-1506.

Clarke, S. (2006). Ther relationship between safety climate and safety performance: A meta-analytical review. *Journal of Occupational Health Psychology,* 11(4), 315-327.

Clarke, S. G., & Cooper, C. L. (2004). *Managing the Risk of Workplace Stress: Health and Safety Hazards.* New York City, NY: Routledge.

Cooper, D. R., & Schindler, P. S. (2006). *Business research methods* (9th ed.). New York: McGraw Hill, Salkind, N. J.

Cooper, M. D., & Philip, R. A. (2004). Exploratory analysis of the safety climate and safety behaviour relationship. *Journal of Safety Research*, 35(5), 497-512.

Dedobbeleer, N. & Beland, F. (1991). A safety climate measure for construction sites. *Journal of Safety Research*, 22(2), 97-103.

Dekker, S. W. A (2002). Reconstructing human contributions to accidents: the new view on error and performance. *Journal of Safety Research*, 33, 371-385

EU-OSHA: Improving construction site safety through safety communication of foremen. Retrieved March, 15, 2018, from https://osha.europa.eu/en/tools-and-publications/publications/improving-construction-site-safety-through-safety-communication-of-foremen.

Fang, D., Chen, Y., & Wong. (2006). Safety climate in construction industry: A case study in Hong Kong. *Journal of Construction Engineering and Management*, 132(6), 573-584.

Flynn, B. A., Schroeder, R. G. & Sakakibara, S. (1994). A framework for quality management research and an associated measurement instrument. *Journal of Operations Management*, 28(4), 339-366.

Ganesh, C. S. & Krishnan, R. (2016). A review of occupation injury research in Malaysia. *Medical Journal Malaysia*, 71, 100-104.

Ganguly, S. (2011). Human error vs. workplace management in modern organizations. *International Journal of Research in Management and Technology*, 1, 13-17.

Garcia, A. M., Boix, P., & Canosa, C. (2004). Why do employees behave unsafely at work? Determinants of safe work practices in industrial employees. *Journal of Occupational Environ Med*, 61, 239-246.

Garcia-Herrero, S., Mariscal, M. A., Garcia-Rodriguez, J. and Ritzel, D. O. (2012). Working conditions, psychological/physical symptoms and occupational accidents. Bayesian network models. *Safety Science*, 50, 1760-1774.

Geller, E. S. (2005). *People-Based Safety: The Source*. Virginia Beach. VA: Coastal Training Technologies Corporation.

Glendon, A. I. & Litherland, D. K. (2001). Safety climate factors, group differences and safety behaviour in road construction. *Safety Science*, 39(3), 157-188.

Goldenhar, L., Williams, L. & Swanson, N. (2003). Modelling the relationship between job stressors and injury and near-miss outcomes for construction labourers. *Work & Stress*, 17(3), 218-240.

Griffin, M. & Neal, A. (2000). Perceptions of safety at work: a framework for linking safety climate to safety performance, knowledge, and motivation. *Journal Occupational Health Psychology*, 5, 347-358.

Guldenmund, F. W. (2000). The nature of safety culture: a review of theory and research. *Safety Science*, 34(1-3), 215-257.

Hair, J., Black, W. C., Babin, B., Anderson, R. E. (2010). *Multivariate data analysis (7th ed.).* Uppers Saddle River, New Jersey: Pearson Education International.

Hamid, A. R. A., Majid, M. Z. A., and Singh. B. (2008). Causes of accidents at construction sites. *Malaysia Journal of Civil Engineering*, 20(2), 242-259.

Havold, J. I. & Nesset, E. (2008). From safety culture to safety orientation: Validation and simplification of a safety orientation scale using a sample of seafarers working for Norwegian ship owners. *Safety Science*, 24(7), 1-22.

Heinrich, H.W. (1980). *Industrial Accident Prevention*. Mc. Graw-Hill Book Company. New York.

Hermann, J. A., Ibarra, G. V. & Hopkins, B. I. (2010). A safety program that integrated behaviour-based safety and traditional safety methods and its effects on injury rates of manufacturing employees. *Journal of Organisational Behaviour Management*, 30(1), 6-25.

Hertzog, M. A. (2008). Considerations in determining sample size for pilot studies. *Research in Nursing and Health*, 31(2), 180-191.

Hinze, J., Huang, X., & Terry L., (2005). The nature of struck-by accidents. *Journal of Construction Engineering and Management*, 13(2), 262.

Hofmann, D. A. & Stetzer, A. (1996). A cross-level investigation of factors influencing unsafe behaviours and accidents. *Personnel Psychology*, 49(2), 307-339.

Hofmann, D. A., & Morgeson, F. P. (1999). Safety-related behavior as a social exchange: The role of perceived organizational support and leader–member exchange. *Journal of Applied Psychology*, 84, 286–296.

Huang, Y. H., Chen, P. Y., Grosch, J. W. (2010). Safety climate: New developments in conceptualization, theory, and research. *Accident Analysis and Prevention*, 42, 1421-1422.

Hussey, J., & Hussey, R. (1997). *Business research: ractical guide for undergraduate and postgraduate students.* New York: Palgrave.

Idris, M. A., Dollard, M. E., & Yulita (2014). Psychosocial safety climate, emotional demands, burnout, and depression: a longitudinal multilevel study in the Malaysian private sector. *Journal Occupational and Health Psychology*, 19(3), 291-302.

ILO (2017). *World Economic Forum*. More than 2 million people die at work each year. Here's how to prevent it.

Jannadi, O. A., Bu-Khamsin, M. S., (2002). Safety factors considered by industrial contractors in Saudi Arabia. *Building and Environment Journal,* 37(5), 539-547.

Johari, J., Tan, F. Y. & Adnan, Z. (2017). Demystifying the empirical link between safety climate, safety communication, work environment, and unsafe behaviour at work. *Jurnal Pengurusan*, 50, 35-43.

Kanten, S. (2013). The relationship among working conditions, safety climate, safe behaviors and occupational accidents: An empirical research on the marble employees. The Macrotheme Review, *A multidisciplinary journal of global macrotrends.*

Khosravi, Y., Asilian-Mahabi, H., Hajizadeh, E., Hassanzadeh-Rangi, N., Bastani, H., and Behzan, A, H. (2014). Factors influencing unsafe behaviors and accidents on construction sites: A review. *International Journal of Occupational Safety and Ergonomics,* 20(1), 111-125.

Kim, C. W., McInerney, M. L., & Alexander, R. P. (2002). Job satisfaction as related to safe performance: A case for a manufacturing firm. *The Coastal Business Journal,* 1(1).

Krejcie, R. V., and Morgan, D. W. (1970). Setermining sample size for research activities. *Educational and Psychological Measurement*, 30(1), 607-610.

Krivonos, P. D. (2007). *Communication in Aviation in Safety: Lessons Learned and Lessons Required.* Paper presented at the Regional Seminar of the Australia and New Zealand Societies of Air Safety Investigations.

Lingard, H. C., Cooke, T., & Blismas. N (2009). Group-level safety climate in the Australian construction industry: within-group homogeneity and between-group differences in road construction and maintenance. *Construction Management and Economics,* 27, 419-432.

Lingard, H., & Rowlinson, S. M. (2005). Development of a safety performance index for construction projects in Egypt. *American Journal of Civil Engineering and Architecture*, 3(5), 182-192.

Lund, J. & Hovden, J. (2003). The influence of safety at work on safety at home and during leisure time. *Safety Science*, 41, 739-757.

McGonagle, A. K., Beatty, J. E. & Joffe, R. (2014). Coaching for employees with chronic illness: evaluating an intervention. *Journal of Occupational Health Psychology*, 19(3), 385-398.

McKenna, F. P. (1983). Accidents proneness: a conceptual analysis. *Accident Analysis and Prevention*, 15, 65-71.

Mearnes, K., Flin, R., Fleming, M. & Gordon, R. (1997). *Human and Organisational Factors in Offshore Safety (HSE Report OTH 543).* HM Stationary Office, Norwich, UK.

Mohamed, S. (2002). Safety climate in construction site environments. *Journal Constr. Eng. Manage*, 128, 375-384.

Moore, G. C., & Benbasat, I. (1991). Development of an instrument to measure the perceptions of adopting an information technology innovation. *Information System Research*, 2(2), 192-222.

Moos, R. H. & Insel, P. N. (1974). *Work Environment Scale Form*. Inc., Mountain View, CA: Consulting Psychologists Press.

Mullen, J. (2004). Investigating factors that influence individual safety behaviour at work. *Journal of Safety Research*, 35, 275-285.

Neal, A., & Griffin, M. A. (2006). A study of the lagged relationships among safety climate, safety motivation, safety behavior, and accidents at the individual and group levels. *Journal of Applied Psychology*, *91*(4), 946-953.

Neuman, W. L. (1997). Social research methods. Qualitative and quantitative approaches (3rd ed.). MA: Allyn & Bacon.

Newaz, M. T., Jefferies, M., Davis, P., & Pillay, M. (2016). *Using the psychological contract to measure safety outcomes on construction sites.* Proceedings of the 32nd Annual ARCOM Conference, 5-7 September 2016, Manchester, UK, Association of Reseachers in Construction Management, 1, 487-496.

Noor, S, M. (2010). *The moderating effect of organizational structure and quality practices on absorptive capacity, technology compatibility and technology transfer relationship.* Unpublished doctoral dissertation, Universiti Utara Malaysia.

Nunally, J. C. (1978). *Psychometric Theory.* New York, NY: McGraw Hill.

Okoro, C, S., Musondo, I., & Agumba, J. (2017). Identifying determinants of construction employee performance on construction sites: A Literature Review. *International Journal of Innovation, Management and Technology*, 8(1), 60-63.

Olanrewaju, K. O., & Farinde, A. J. (2014). The potentials of traditional communication methods in information dissemination: A case study of farmers in Osun State, Nigeria. *South African Journal for Communication Theory and Research*, 40(4), 361-375.

Omar, Y., & Sindi, M. (2015). Impact of work pressure on the performance of Saudi Airlines staff: Case study on booking staff of Saudi Airlines in Jeddah. *International Journal of Academic Research*, 7(1), 229-235.

Orlikoff, J. E. & Totten, M. K. (2009). Eavluating the board chair creating a process for assessing leaders reinforces a commitment to governance accountability and continuous improvement. *Healthcare Executive*, 24(1), 60-72.

Osman, W. N., Amminudin, N. S., & Nawi, M. N. M. (2017). Kajian kes pengurusan keselamatan dan kesihatan pekerja di tapak bina: Persepektif kontraktor. *Journal of Advanced Research in Business and Management Studies*, 7(1), 51-59.

Park, C. S., Kim, H. T., Goh, J. H., Pedro, A. (2016). BIM-based idea bank managing value engineering ideas. *International Journal Project Management*, 35(4), 686-698.

Patel, D. A., & Jha, K. N. (2015). Neural network model for the prediction of safe work behaviour in construction projects. *Journal Constr. Eng. Management*, 141(1), 1-13.

Peter Warr (2001). Age and work behaviour: Physical attributes, cognitive abilities, knowledge, personality traits and motives. *International Review of Industrial and Organisational Psychology*, 16, 1-36.

Rahman, M. A. (2012). *Tahap Kesedaran Guru-Guru Tadika Terhadap Keselamatan dan Kesihatan Pekerjaan di Tempat Kerja: Kajian Kes di Negeri Melaka*. PhD diss., Universiti Utara Malaysia.

Reason, J. (2005). Safety in the Operating Theatre - Part 2: Human Error and Organisational Failure. *Quality Safety Health Care*, 14, 56-61.

Rundmo, T. (1990). *Risk and Perception of Safety*. Research Report Norwegian Petroleaum Directorate, Trondheim/Stavanger.

Sadullah, O. & Kanten, S. (2009). A research on the effect of organizational safety climate upon the safe behaviors. *Eng Academic Review*, 9(3), 923-932.

Salim, F. N. A. (2012). *Kajian keselamatan dan kesihatan di tapak bina sekitar kawasan bahagian pantai barat Sabah.* Thesis Sarjana Muda. Universiti Teknologi Malaysia.

Salkind, N. J. (2006). Exploring Research (6thed.). Pearson Education, Inc., Upper Saddle River, NJ

Samewoi, Z. (2010). *Tahap kesedaran kontraktor terhadap latihan keselamatan di tapak bina*. Fakulti Alam Bina: Universiti Teknologi Malaysia.

Sekaran, U. (2005). Research methods for business: A skill building approach (4thed.). Singapore: John Wiley & Sons, Inc.

Sekaran, U., & Bougie, R. (2010). *Research methods for business. A skill building approach* (5thed.). West Sussex, United Kingdom: John Wiley and Sons, Ltd, Publication.

Shen, Y., Koh, T. Y., Rowlinson, S., & Bridge, A. J. (2015). Empirical investigation of factors contributing to the psychological safety climate on construction sites. *Journal of Construction Engineering and Management*, 141(11), 15-38.

Shen, Y., Zhang, P., Koh, Y., Rowlinson, S., & Leicht, R. (2017). The effecta of group safety climate on construction personnel's safety behaviour: A cross-level investigation. *Proceedings of the 15th Engineering Project Organization Conference with 5th Megaprojects Workshop (EPOC-MW 2017).* Lake Tahoe California, U. S, 1-11.

Sinclair, R. R., Martin, J. E. & Sears, L. E. (2010). Labor unions and safety climate: Perceived union safety values and retail employee safety outcomes. *Accident Analysis and Prevention*, 42, 1477-1487.

Siu, O. L., Philips, D. R., & Leung. T. W. (2004). Safety climate and safety performance among construction employees in Hong Kong. *Accident Analysis and Prevention,* 36, 359-366.

Spencer, L. M. & Spencer, S. M. (1993). Competence at work. *Human Resouirce Development Quarterly,* 5, 391-395.

Stave, C., Pousette, A. & Torner, M. (2008). Risk and safety communication in small enterprises-how to support a lasting change towards work safety priority. *Journal of Risk Research,* 11 (1-2), 195-206.

Stephen, S. S. Cole, H. J., Jenkins-Gibbs, K., Richle, C. F. & Weare, W. H. (2009). Developing core leadership competencies for library profession. *Library Leadership and Managament,* 23(2), 118-126.

Straub, D., Boudreau, M., & Gefen, D. (2004). Validation guidelines for it positivist research. *Communication of the Association for Information System*, 13(24), 380-427.

Ticehurst, G. W., & Veal, A. J. (2000). *Business research methods: A managerial approach.* Pearson Educatrion Australia, NSW.

Varonen, U. & Mattila, M. (2000). The safety climate and its relationship to safety practices, safety of the work environment and occupational accidents in eight wood processing companies. *Accident Analysis and Prevention*, 32, 761-769.

Vinodkumar, M. & Bhasi, M. (2009). Safety management practices and safety behaviour: Assessing the mediating role of safety knowledge and motivation. *Accident Analysis & Prevention,* 42(6), 2082-2093.

Wang, Y. F., Faghih Roohi, S., Hu, X. M., & Xie, M. (2011). Investigations of Human and Organizational Factors in hazardous vapor accidents. *Journal of Hazardous Materials,* 191(1-3), 69-82.

Warr, P. (2002). *Psychology at Work*. London: Penguin Books.

Wiersma, W. (1993). *Research methods in education: An introduction* (5thed.). Boston: Allyn & Bacon.

Wills, A. R., Biggs, H. C. & Watson, B. (2005). An analysis of a safety climate measure for occupational drivers and implications for safer workplaces. *Australian Journal of Rehabilitation Counselling,* 11, 8-21.

Wills, A., Watson, B. & Biggs, H. (2009). An exploratory investigation into safety climate and work-related driving. Journal Safety Research, 32(1):81-94.

Wirth, O., and Sigurdsson, S. O. (2008). When workplace safety depends on behaviour change: topics for behavioural safety research. *Journal of Safety Research*, 39, 589-598.

Woods, T. F. (2009). *Avoid These Unsafe Behaviors to Prevent Workplace Accidents.* Thomas Ferner Woods Agency Inc, Columbus.

Wu, X., Liu, Q., Zhang, L., Skibniewski, M. J. & Wang, Y. (2015). Prospective safety performance evaluation on construction sites. *Accident Analysis and Prevention*, 78, 58-72.

Yeong, S. S. & Wahab, S. R. A. (2016). The Mediating Effect of Safety Culture on Safety Communication and Human Factor Accident at the Workplace. *Asian Social Science*, 12(12), 127-142

Zaira, M. M., and Hadikusumo, B. H. W. (2017). Structural equation model of integrated safety intervention practices affecting the safety behaviour of employees in the construction industry. *Safety Science*, 98, 124-135.

Zikmund, W. G. (1994). *Exploring marketing research* (5th ed.). TX: The Dryden Press.

Zohar, D. (2002). The effects of leadership dimensions, safety climate, and assigned priorities on minor injuries in work groups. *Journal of Organizational Behaviour*, 23(1), 75-92.

Zohar, D., & Luria, G. (2003). A multilevel model of safety climate: Cross-level relationships between organization and group level climates. *Journal of Applied Psychology*, 90, 616-628.

Zohar, D., & Polachek, T. (2014) Discourse-based intervention for modifying supervisory communication as leverage for safety climate and performance improvement: a randomized field study. Journal Appl. Psychology, 99(1), 113-124.

APPENDIX A

Dear Sir/Madam,

First and foremost, I would like to congratulate you for being selected as respondent in this study. These questionnaires are made to obtain information about your experience and knowledge to determine the influence of safety climate, safety communication, and work environment on unsafe behaviour among workers. Your opinion is important in helping me understand the unsafe behavior. This study is a partial fulfillment of the requirements for the degree of Master of Occupational Safety and Health

For your information, your involvement in this research is voluntary. In addition to that, I assure you that confidentiality of the information provided and your identity is secured. All information provided will be used for research purpose only. Many thanks for your support in helping me to complete this questionnaire.

Should you require further explanation please do not hesitate to contact me. at: ghazali.bin.abdaziz@gmail.com or 019-3168696

Thank you.

Ghazali Bin Abd Aziz
Master of Science Occupational Safety and Health Management
School of Business
Univeriti Utara Malaysia

10.02.2018

QUESTIONNAIRES
(SOAL SELIDIK)

INSTRUCTION *(ARAHAN)*
Please complete the questionnaire by marking your chosen answer with an 'X' in the space provided.
(Sila jawab kesemua soalan yang dikemukakan dengan menandakan 'X' pada ruang yang disediakan)

SECTION A: BACKGROUND INFORMATION (MAKLUMAT LATAR BELAKANG)

1. Your year of birth (*Tahun anda dilahirkan*)? ☐☐☐☐
2. Are you (*Anda ialah*) ☐ Male (*Lelaki*) ☐ Female (*Perempuan*)
3. Your position (*Jawatan Anda*)? _____
   Specify (*Nyatakan*)

SECTION B: UNSAFE BEHAVIOUR (*TINGKAHLAKU TIDAK SELAMAT*)

Items *Perkara*	Strongly disagree *Sangat tidak setuju*	Disagree *Tidak setuju*	Slightly disagree *Sedikit tidak setuju*	Slightly Agree *Sedikit setuju*	Agree *Setuju*	Strongly agree *Sangat setuju*
1. I ignore safety regulations to get the job done. *Saya abaikan peraturan keselamatan untuk menyiapkan kerja.*						
2. I carry out activities which are forbidden. *Saya melakukan aktiviti yang dilarang.*						
3. I break work procedures. *Saya melanggar peraturan kerja.*						
4. I take chances to get the job done. *Saya ambil kesempatan untuk menyiapkan kerja.*						
5. I bend the rules to achieve a target. *Saya melanggar peraturan untuk mencapai sasaran.*						

6. I get the job done better by ignoring some rules. *Saya dapat melakukan kerja lebih baik dengan mengabaikan beberapa peraturan.*						
7. Conditions at the workplace stop me working to the rules. *Keadaan di tempat kerja menghalang saya bekerja mengikut peraturan*.						
8. Incentives encourage me to break rules. *Insentif menggalakkan saya melanggar peraturan.*						
9. I take shortcuts which involve little or no risk. *Saya mengambil jalan pintas yang melibatkan sedikit atau tanpa risiko.*						

SECTION C: SAFETY CLIMATE (*IKLIM KESELAMATAN*)

Items *Perkara*	Strongly disagree *Sangat tidak setuju*	Disagree *Tidak setuju*	Slightly disagree *Sedikit tidak setuju*	Slightly Agree *Sedikit setuju*	Agree *Setuju*	Strongly agree *Sangat setuju*
1. The written safety rules and instructions are too complicated for workers to follow. *Peraturan dan arahan keselamatan bertulis sangat rumit untuk diikuti pekerja*.						
2. If I didn't take a risk now and again, the job wouldn't get done. *Jika saya tidak mengambil risiko sekarang dan seterusnya, kerja tidak dapat dilakukan.*						
3. The standard of safety is very high at my place of work. *Standard keselamatan sangat tinggi ditempat kerja saya.*						

4. I can get job done quicker by ignoring rules. *Saya boleh melaksanakan kerja lebih cepat dengan mengabaikan peraturan.*						
5. The rules do not always describe the safest way of working. *Peraturan tidak selalunya menerangkan cara kerja yang paling selamat.*						
6. There is sometimes pressure to put datelines before safety in this construction site. *Kadang-kala terdapat tekanan terhadap keutamaan menyiapkan projek daripada keselamatan di tapak pembinaan ini.*						
7. Nowadays, managers are more interested in safety than construction of project. *Pada masa kini, pengurus lebih berminat terhadap keselamatan berbanding projek pembinaan.*						
8. There is a good attitude to safety in this construction site. *Terdapat tingkahlaku yang baik terhadap keselamatan di kawasan pembinaan ini.*						
9. Rules and instructions relating to personal safety sometimes make it difficult to keep up with project dateline. *Peraturan dan arahan yang berkait dengan keselamatan peribadi selalunya menyukarkan menyiapkan projek mengikut sasaran.*						
10. Workers are reluctant to report accidents. *Pekerja agak keberatan melaporkan kemalangan.*						
11. Safety is taken seriously in this construction site. *Keselamatan diambil serius di kawasan pembinaan ini.*						

12. Management is genuinely concerned about workers' safety. *Pengurusan benar-benar prihatin tentang keselamatan pekerja.*						
13. Sometimes it is necessary to ignore safety regulations to keep construction works going. *Kadang-kala adalah perlu untuk mengabaikan peraturan keselamatan untuk memastikan kerja-kerja pembinaan berjalan lancar.*						
14. Workers on this construction site refuse to do work if they feel the task is unsafe. *Pekerja di tapak pembinaan ini enggan melakukan kerja jika mereka merasa tugasan adalah tidak selamat.*						
15. I feel that the management on this construction site is concerned about my general welfare. *Saya rasa pengurusan di kawasan tapak pembinaan ini mengambil berat terhadap kebajikan am saya.*						

SECTION D: SAFETY COMMUNICATION (*HUBUNGAN KESELAMATAN*)

Items *Perkara*	Strongly disagree *Sangat tidak setuju*	Disagree *Tidak setuju*	Slightly disagree *Sedikit tidak setuju*	Slightly Agree *Sedikit setuju*	Agree *Setuju*	Strongly agree *Sangat setuju*
1. I am satisfied with the way I am kept informed about what takes place on. *Saya berpuas hati dengan cara saya diberi maklumat tentang apa yang berlaku.*						
2. There is good communication between management and construction workers. *Terdapat komunikasi yang baik di antara pengurusan dan pekerja binaan.*						

3. I am consulted before decisions are made. *Saya dirujuk sebelum sebarang keputusan dibuat.*						
4. There is good communication between construction workers changes. *Terdapat komunikasi yang baik semasa pertukaran pekerja binaan.*						
5. My supervisor gives me clear instructions. *Penyelia saya memberi arahan yang jelas*						
6. I have a fair opportunity of influencing the decisions to be made by my superiors. *Saya mempunyai peluang mempengaruhi keputusan yang akan dibuat oleh penyelia saya*						
7. I know what I can expect from others. *Saya tahu apa yang boleh saya jangkakan daripada orang lain.*						

SECTION E: WORK ENVIRONMENT (*PERSEKITARAN KERJA*)

Items *Perkara*	Strongly disagree *Sangat tidak setuju*	Disagree *Tidak setuju*	Slightly disagree *Sedikit tidak setuju*	Slightly Agree *Sedikit setuju*	Agree *Setuju*	Strongly agree *Sangat setuju*
1. There is constant pressure to keep working. *Terdapat tekanan berterusan untuk terus bekerja.*						
2. Things are sometimes disorganized. *Keadaan kadang-kala tidak teratur.*						
3. There always seems to be urgency about everything. *Kerap kali terdapat keutamaan tentang segala-galanya.*						
4. Activities are well planned. *Aktiviti dirancang dengan baik.*						

5. Workers cannot afford to relax. *Pekerja tidak mampu untuk berehat.*						
6. Rules and regulations are somewhat vague and ambiguous. *Peraturan dan undang-undang agak kabur dan samar-samar.*						
7. Nobody works too hard. *Tiada sesiapa yang bekerja lebih kuat.*						
8. The responsibilities of supervisors are clearly defined. *Tanggungjawab penyelia ditakrifkan dengan jelas.*						
9. There is no time pressure. *Tiada tekanan tentang masa.*						
10. The details of assigned jobs are generally explained to workers. *Perincian tugas lazimnya dijelaskan kepada pekerja.*						

☺ Thank you for filling in the questionnaire. ☺

☺Terima kasih kepada anda kerana sudi menjawab borang soal selidik kajian☺