MANAGEMENT & ACCOUNTING REVIEW

C O N T E N T S

Transition from University to Industry: Challenges Faced by New Engineers in the Automotive Industry

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ABSTRACT

The Malaysian automotive manufacturing industry is growing exponentially, but it faces a shortage of the right skilled automotive manufacturing professionals to propel the industry to an unprecedented height. This research hypothesised that there are several challenges faced by new engineers in executing their daily tasks due to knowledge gap. New engineers are not guided and trained sufficiently to undertake their daily tasks to be more productive. Therefore, this research aims to identify the knowledge gap and challenges faced by new engineers in the automotive industry in Malaysia. The scope of this research is confined to the theory of Human Capital, which relate to the capabilities and skills of an employee to improve job performance. A qualitative case study method was employed for the analysis and comparison of data from public and private universities and the automotive manufacturing industry in Malaysia. The identified target groups were human resource managers, manufacturing managers, new engineers and lecturers. This study concludes that training in the industry has failed at certain aspects to produce new employees that meet current competency requirements, leading to the deterioration of employee work performance. In conclusion, this research validates the existence of a knowledge gap and acknowledges the need to overcome challenges faced by new engineers during their trasition from the academia to industry.

Keywords*: Industrial Experience, Knowledge Gap, Challenges, New Engineers, Skills, Training.*

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INTRODUCTION

According to Keizrul (2008), Malaysia is now experiencing a shortage of experienced engineers in certain areas. One of the root causes of the dwindling interest in engineering is the structure of the Malaysian education system. In our education system, students are being "taught" to follow the lessons rather than being taught to learn on their own. To be an engineer, one should be able to understand the materials and resources, their physical attributes, and their strengths and weaknesses, to be able to make improvements to existing products or to create new products. Apart from that, one should be analytical and logical, able to solve problems, and have good communication skills. As per Strand Aerospace Malaysia (2013), high technology and high-end specialized services in design engineering is a key enabler to becoming a high technology nation. As such it is important to develop technically competent engineers who will have the correct attitude and behaviour expected of an engineer. This is done to "bridge the gap" between an engineer fresh out of university and one that is ready to serve the industry. The automotive manufacturing industry is recognizing the need to grow and attract new automotive manufacturing professionals. One of the most critical issues for these challenges is the expected knowledge that is peculiar to the nature of the automotive manufacturing industry. Based on iTalent (2013), to meet the expected increase in demand for graduates, more positions must be filled by individuals without the right knowledge. They will have to learn all industry specific knowledge on-the-job, or through the training programs organized by the industry. While these industry-funded and operated programs offer excellent training, it also takes an extensive period until graduates become effective contributors to the company. The potential challenges faced by new engineers and the high costs and resources needed to train engineering graduates provide two reasons to investigate if the current approach for developing entry-level engineers is the most cost-effective option.

LITERATURE REVIEW

Salas, Tannenbaum, Kraiger & Smith (2012) advocated that training is viewed as a system that is essential to promote learning and enhance on-the-job performance. Training is not just an activity that happens in a

classroom. Hoping for the training research to progressively inform and guide the design of effective training, a well-designed training shall be effective in educating employees, but the most important aspect is how well the organization manages the training coordination. However, pointed out by Aarti chahal (2013) that there is a lack of needs assessment before training. Training needs assessment is the foundation of the entire instructional design process. If not done correctly, or at all, the job-relatedness, effectiveness and validity of any training program will be jeopardized.

In this globally competitive market and constant technology growth, carrying out good training and obtaining results from learning investment is vital, and not a choice. Organizations must consistently aid employees to master new skills and abilities. In fact, it was found that effective practices by organizations related to staffing and training were positively related to perceived organizational performance (Salas et al., 2012). Despite this reality, almost every training evaluation guidelines are made up conceptually as if training were the main aspect of evaluation. Training itself operates only to maximise capability. But whether employees give their best or more is driven by a complex web of reasons, typically and popularly categorized under the rubric of the 'performance management system'. When training is simply carried out as a different intervention, like a stand-alone programme or talk, it does almost nothing to affect job performance.

Based on Salas et al. (2012), some training fails to produce any learning, and a great deal of learning occurs outside of training. Some of the organizations plan and implement the training program for their employees without identifying the purpose and objectives and without knowing what the knowledge, skills and abilities employees would acquire at the end of the training program, and whether they will be able to attain performance targets on job (Amir & Amen, 2013). Hence, organizations that are serious about getting better results from training need to work to bring up their quality, convenience of training and the whole training-to-performance process, especially on those non-training reasons of the performance management ethic that bear on if training-produced skills are used in upgraded individual and business performance. Undeniably, all people in the organization should take part in the process to make training happen, because no one man can ascertain success, nor take all the credit.

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METHOD

This study utilised a case study method to collect data from two private universities, two public universities and an automative manufacturing company. This automotive manufacturing company selected is in the state of Selangor. This Malaysian and Japanese joint venture company which was established in 1970 has been producing non-national cars for the local and foreign markets. The interview data was collected from six new engineers (NE1 to NE6), one human resource manager (HRm) and two supervisors (SV1 to SV2), four lecturers (LEC1 to LEC4) who are working or have worked in the relevant automotive industry. These informants were expected to appropriately respond from their varying perspectives to questions pertaining to identify the challenges that the automotive industry faced in preparing new engineers at the workplace. Semi structured open-ended interview questions were selected to document face to face interview findings from these participants.

Open coding was used to identify concepts and properties through comparative analysis to discover and categorise the variables according to their similarities and differences based on the themes emerged from the analysis. The coding of the category has allowed the coding to emerge inductively by breaking down data into bits of information and then using axial coding to put the pieces of information together again in a new way to describe what is happening with each interviewee. When central ideas begin to emerge from the data these ideas have represented as categories to describe the variables used by each respondent. The categories are bits of information from each interview that grouped to explain the specific characteristics. Categories or themes that captured recurring patterns in the data have been constructed through the constant comparative methods of data analysis.

FINDINGS

One of the important themes identified in this research was, 'Challenges faced by new engineers in industry'. This question serves to evaluate the challenges faced by new engineers at the beginning of their careers in the industry. The transition from academia to industry is usually an exciting and challenging experience. Informant NE4 stated that:

> *"It was a culture shock for me to know that the social and working culture is absolutely different. The emphasis and enforcement of strict rules and regulations are unacceptable for me initially but eventually have to adopt as that is the basic requirement in any organization"*
>
> (NE4, 6.4).

Informant LEC3 is aware of the different challenges in various industries based on feedback from his students, said:

> *"The reason for them to go for industrial training is part of getting to feel the difficulties at industry and be prepared to adapt to new working place. I always highlight the challenges they have to face at industrial training and employment"*
>
> (LEC3, 4.1).

Informant NE1 admitted that when he started his career, he faced a huge uphill task of learning the various skills needed for his job in a short period of time.

> *"It was too much for me to learn within a short span of time. The most difficult part was seeking my peers support to complete my assignment was a real struggle"*
>
> (NE1, 4.2).

According to HRm:

> *"HRd's role on OJT is making the policy that is compulsory for every new employee to undergo 6 months OJT at their respective work area. The department's role is to plan and ensure every employee is trained well at their respective work area"*
>
> (HRm, 4.3).

However, NE3 complained that he was not given any guidance and was forced to learn much of his job's specifics on his own using the Standard Operating Procedures (SOP) as reference.

"There was no Standard Operating Procedure (SOP) for the entire job that I have to learn and some of the SOP was outdated. That has created problems for me to learn systematically and have to learn from peers and seniors to execute my job"

(NE3, 4.5).

According to SV1:

"We expect the new engineers to ask and learn on their own initiative if they encounter any problem at work. The new engineers can always refer to their mentor or superiors to learn. But mentor and new engineer has to find a suitable time to interact"

(SV1, 4.2).

Informant NE2 agrees that:

"Not all of them are willing to help. We have to ask and learn from whoever we deal with in the process of work"

(NE2, 4.4).

Informant NE1 stressed that he could not take advantage of his organization's training plans because of the time constraint of his job and the limited budget of his organization.

"I wanted to learn quickly and requested for more formal training but was turned down due to limited training budget allocated per head and have to learn mostly on the job. Learning at work is not well structured unlike the formal training"

(NE1, 4.4).

Informant HRm agrees, saying:

"The on-job training is done at the work station and we cannot expect the condition to be same as the formal classroom training. But some new engineers are not comfortable with the OJT methodology"

(HRm, 4.4).

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Informant NE6 faced some other challenges as well:

"My problem was to network with all relevant department staff. Initially I had problem dealing with others to get the data as time goes it became easier. I have to learn the skills to deal with others to get the right data"

(NE6, 4.2).

Informant SV2 agrees that some new engineers have a problem communicating and interacting with others.

"Some of the new engineers are very sensitive and give up easily and some have even quit the job due to inability to communicate with difficult people in the production department"

(SV2, 4.1).

On the other hand, NE5 stated that:

"Sometimes when HR calls for training, we are not able to go due to job commitment. Too much of follow-up, meetings and task related issues are the hindrances restricting me from attending formal training organized by HR"

(NE5, 4.1).

HR manager, concedes that it is very difficult to get full attendance for the planned formal training sessions, citing tight work schedule as one of the major reasons given by employees.

"My training plans are well designed and presented to all department heads before announcing to all staff, at least 2 training programs per staff per year basis. However, it depends on the superiors to send their subordinates for training"

(HRm, 6.2).

From this analysis, we can conclude that new engineers face quite several job-related issues which mostly stems from their lack of understanding of the manufacturing industry culture. However, regardless of their previous experiences or educational background, new engineers

are expected to be well informed on the culture, condition, systems and development plans in the manufacturing industry. HR has devised plans to develop competent new employees, but the plans can only be executed successfully if the Heads of Department (HOD) agree to commit their staff to these plans. Supervisors believe OJT should be the right way to make the transition from academia to the industry, but the new engineers seem rather sceptical and ignorant on this training methodology in this study.

DISCUSSION

The theme of "Challenges faced by new engineers in industry" has been classified into six sub themes for further discussion:

Transition from University to Industry

The transition from the academia to industry is usually an exciting and challenging experience for new recruits. Fresh graduates start off their careers with certain expectations on starting a new life. However, fulfilling these expectations depends significantly on the graduates' preparation, commitment and perseverance to face unexpected challenges in the industry. New engineer (NE4) mentioned that it was a culture shock for him to know the working culture in the industry was unexpected. Everything was about adhering to strict rules, more than 8 hours of full time work; attend meetings, solving production issues, presentations and inter-department interactions. The past findings also stress on the importance of human relation skills by Rahmah Ismail (2011), "Employers want graduates to have a blend of technical and human relations skills and some employers require graduates to acquire more intrinsically humanistic skills rather than academic or technical skills. Communication, team work, problem solving, initiative and enterprise skills, planning and organizing, self-management, learning skills and technology are the core work skills that can create a productive employee".

Garner Support from Peers

New engineer (NE1) admitted that when he started his career, he faced a huge uphill task of learning various skills needed for his job within a short period of time. He found it difficult to learn from his superiors and garner

the support of his peers to complete his tasks. Some of the new engineers said that the challenge was getting to do their job independently within 2 - 4 weeks after joining their department was really very difficult to cope. Generally, they were guided by their superiors or peers through verbal explanation regarding job methods and Standard Operating Procedures (SOP) at the department level. New engineer (NE6) from the QC department stated that his challenges were in creating a reliable network with all relevant departments. His work involves dealing with many departments to collect data pertaining to the quality of vehicle inspection daily. Initially he had problems dealing with others to get the data eventually through building good relationship with counterparts, it became much easier. He must learn the art of dealing with people to make things happen. His greatest challenge was getting cooperation from the production department to get accurate data on time. Seeking support from the non-engineering staff was another challenge that the new engineers must go through. Engineers must be able to work with the non-engineering staff as mentioned by Tang (2014), "In the 21st century, an ever-increasing need will emerge for a holistic breed of engineers—one who can work across borders, cultural boundaries, and social contexts and who can work effectively with non-engineers". When New Engineer (NE1) wanted to complete his task, he must have a sound knowledge of the painting process for which he was virtually begging his seniors from the shop-floor to help him. From this discussion we can conclude that the engineers are having some issues in coping with their job when they are new. According to the lecturers, students have been prepared to face industry challenges through their internship. Furthermore, internship is part of getting to feel the difficulties at the industry and to be prepared to adapt to a new working place.

Training Plan

Most of the new engineers raised concerns on the constraints of staff training and development plans at the industry. In most cases, the staff training plan does not match the job requirement. The job demands, and training timings would not be in tandem most of the time to assist the new engineers in assigned tasks. In such cases they must rely solely on their peers and superiors to guide them. According to new engineer (NE1), he wanted to learn quickly and requested for more formal training but was turned down due to a limited training budget allocated per head and had to learn

mostly on the job. Concurring with past findings by Chaudhry (2010), "It has been observed that most of the enterprises were merely raising slogans regarding the importance of training and development of human capital, but most of them were not properly investing on the development of their human resources". Overall, learning of OJT was not well structured, generally done based of the availability of the coach. The HR manager was aware of the constraints and mentioned that the OJT is done at the work station and cannot expect the condition to be same as the formal classroom training.

Communication Skills

According to supervisors, most of the new engineers are lacking skills in interacting with others. Communication skills cannot be learned directly from books, it must be developed naturally over time dealing with various types of people at work. Some of the new engineers were very naïve and quit the job due to inability to communicate with difficult people at workplace. New engineer (NE5) said his main weakness is soft skills, especially communication skills when dealing with difficult people and foster teamwork, but the existing personal development skills training was not sufficient to help him to face the challenges ahead. Communication skills and English language skills are two of the most important traits that graduate engineers need to develop. According to the Minister of Higher Education, Datuk Seri Idris Jusoh, it would make Malaysian graduates more marketable through English proficiency and communication skills, among others (Lim, Nor Idayu, Basri, Norhanim & Hamimi, 2016). The Engineering curriculum must make sure that their programs are preparing students to understand professional practice issues rather than having the capability in technical subjects only. In fact, the students must have communication skills, pursue life-long learning, and apply creative and critical thinking skills.

Commitment for Attending Training

Sometimes when HR calls for training we are not able to go due to job commitments. Too much of follow-up, meetings and task related issues have restricted him from attending formal trainings organized by the human resource department. HRm concedes that it is very difficult to get full attendance for the planned formal training sessions, citing tight work schedules as one of the major reasons given by the employees and

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superiors. Human resource department's training plans are well designed and presented to all department heads and staff on the requirement of two training programs per staff per year basis. However, in reality, human resource development does not have the authority to force the staff to attend training and all depends on the willingness of the superiors to allow their subordinates to attend formal training.

Learning through On the Job (OJT)

Supervisors believe OJT should be the right way to make the transition from the academia to the industry, but the new engineers seem rather sceptical and ignorant on this training approach. According to one of the new engineers (NE3), he was not given any guidance and was forced to learn much of his specific job requirement skills and knowledge on his own using the Standard Operating Procedures (SOP) as reference. Not all the SOP is updated to the current practice and there is no SOP for some tasks. Suggestions were made to improve OJT in the past research by Kobes (2013), employers need support to develop high-quality training programs that are suitably structured, and to enable supervisors and trainers to balance their OJT responsibilities with their usual responsibilities, including meeting production goals and targets. It is important for a trainer or a coach at OJT to conduct training in a simple and systematic way to enhance the new employees' knowledge and skills needed in the manufacturing environment today. There has been an ongoing debate about the role of work-based learning in higher education. Obviously, work-based learning has offered an exceptional opportunity for students to meet many of the learning objectives sought by the programme and the institution, often not easy to attain in other modules in the programme (O'Neill, 2015).

CONCLUSION

Informants highlighted that engineering courses are unavoidable in the engineering faculty but the lack of relevant manufacturing courses in the university curriculum hasmade it difficult for new engineers to fit into the job right away. However, it is not possible to cater absolutely to any specific industry's needs as the need of industry varies according to the nature of business. What lecturers are doing at the university level is

preparing students on generic skills so that the students can be employed at any industry and be able to use their thinking capability to execute tasks appropriately. The university is focusing on developing students' generic engineering knowledge and skills, build confidence and become an all-rounder. With that, the new engineers are required to use their basic technical knowledge gained at university and must have the ability to convert it into practice at the industry appropriately. From the findings, it is concluded that the transition period from university to industry is a challenging period for new engineers. At the workplace, these new engineers lack confidence to apply what they have learned in university at their workplaces. Hence, they must know how to relate university knowledge to industry application; in simple terms, they need to translate theory learned at the university into practice at the work place. However, most of the new engineers seem to be lost and not sure of the linking point between theory and practice when they first enter the job market. These new engineers are not familiar with the real industrial work environment, and it was a shocking experience for them to adapt to the industry work culture. The findings of this study show that transition from student to employee is rather slow. They must quickly change their mind-set and attitude to explore and learn new knowledge. Their wrong attitude such as lack of interest in work, tardiness, lack of interest in learning and an inability to manage work pressure has resulted in unnecessary stress. Once they can overcome their challenges of lack of skills and competency, they will become skilful workers at the workplace.

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REFERENCES

Aarti chahal (2013). *A study of Training Need Analysis based training and development: effect of training on performance by adopting development-based strategy*. International Journal of Business and Management Invention. Volume 2 Issue 4.

Amir Elnaga & Amen Imran (2013). *The effect of training on employee performance.* Vol.5, No.4. European Journal of Business and Management.

Chaudhry, N. I. & Roomi, M. A. (2010). *Accounting for the development of human capital in manufacturing organizations: A study of the Pakistani textile sector.* Journal of Human Resource Costing & Accounting. Vol. 14 No. 3. 178-195.

Fuchs, W. (2011). *Global automotive industry*. Retrieved on May 2013 from globalautomotiveindustrynews .com/Global-Automotive/tag/shortage.

iTalent (2013). *Shortage of automotive engineer*. Retrieved on Oct, 2013 from www.malaysia-motoring-news.com.

Keizrul bin Abdullah (2008). Retrieved in January 2013 from www.myiem. org.my/content/iem_excomm.

Kobes D. (2013). *Making on-the-job training work. Lessons from the Boeing manufacturing on-the-job training project.* National Fund for workforce solution 2.0.

Lim Khong Chiu & Nor Idayu Mahat & Basri Rashid & Norhanim A. Razak & Hamimi Omar (2016). *Assessing students' knowledge and soft skills competency in the industrial training programme: The employers' perspective.* Review of European Studies; Vol. 8, No. 1.

MOHE (2013). *Article on education in Malaysia*. Retrieved Nov 21, 2013 from www.mohe.gov.my/educationmsia /index.php? article=mohe.

Mukherjee, A. (2013, May 11). My star job.com. The Star Newspaper. 3.

O'Neill, G. (2015). *Curriculum design in higher education: Theory to practice,* Dublin: UCD Teaching & Learning. *1st Edition.*

Rahmah Ismail & Ishak Yussof & Lai Wei Sieng (2011). *Employers' perceptions on graduates in Malaysian services sector.* Volume: 5. Issue: 3. 184-193.

Salas E. & Tannenbaum S. I. & Kraiger K. & Smith-Jentsch K. A. (2012). *The science of training and development in organizations: What matters in practice.* Psychological Science in the Public Interest. 13(2) 74 –101.

SAM (2013). *Developing Malaysian engineering human capital*. Retrieved from www.mida.gov.my/env3/uploads/events/ LIMA2013/Strand.pdf.

Tang, X. F. (2014). *Engineering Knowledge and Student Development: An Institutional and Pedagogical Critique of Engineering Education.* UMI. ProQuest.

Teo Lee Kuan (2013). *Recruitment strategy.* Retrieved from Human Resources Malaysia Magazine.