



Determination of Constructs and Dimensions of Employability Skills Based Work Performance Prediction: A Triangular Approach

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ABSTRACT

The level of the employability skills of the graduates as determined by job role and mapped to the employability skills, which correspond to the requirement of employers, will have significant impact on the graduates' job performance. The main objective of this study was to identify the constructs and dimensions of employability skills, which can predict the work performance of electronic polytechnic graduate in electrical and electronics industry. A triangular qualitative approach was used in the early stages in the development of research constructs and dimensions employability skills based work performance prediction (ESWPP) of document analysis and expert interview protocol from the electrical and electronics industry and the institutions perspective. Document analysis was done by using frequency matrices tables while interview data involving experts from industry and institution were analyzed using Fleiss Kappa reliability. Fleiss Kappa reliability analysis is used to determine the overall dimensions of the approval index for each construct ESWPP. The findings of the overall Kappa coefficient value at 0.91 and 0.99 for the industry and the academia, which indicates the level of agreement, is very good. The results showed that the constructs and dimensions ESWPP were communication skills, personal qualities, teamwork skills, critical thinking skills and problem solving, technology skills, organizational skills and learning skills.

Keywords: Employability Skills, Graduate Electronic Polytechnic, Job Roles, Construct, Dimensions

JEL Classifications: M001

1. INTRODUCTION

Today's market has a steady stream towards globalization, diversification changes in technologies and intense highly competition among companies and countries. Employers nowadays are concerned about finding good employees not only with technical skills but they are also looking employees with high competitiveness and ability to adjust with rapid changes in the industry (Shafie and Nayan, 2010; Johari et al., 2011; Mohd Sahandri et al., 2012; Selvadurai et al., 2012; Mohamad et al., 2012; Yahya et al., 2013; Fong et al., 2014).

There are employability skills that employers like to see in an engineering graduate and these can vary according to type of role

to coop with the job market scenario (Raybould and Sheedy, 2005). Employability skill refers to work readiness that is possession of the attributes, skills and knowledge of the engineering graduate should possess to obtain a job; also to ensure they have the capability being effective in the workplace; could also assist to adjust themselves towards various changes suit with the working environmental needs and could eventually enhance careers through the acquisition of those skills (Normala and Yahya, 2013).

Study on employability requires sustained effort so that the institution can learn the employability skills necessary changes by employers to job performance in order to strengthen efforts to provide quality engineering graduates. Many researcher have

proven, there are contradict the importance of employability' skills for employees (Archer and Davison, 2008; Mustafa et al., 2008; Lowden, 2009; Shukla, 2012). However, although ample evidence, there are limitations in previous studies. Most studies used adaption constructs and dimensions Employability Skills from Secretary's Commission on Achieving Necessary Skills (SCANS, 1991) and model employability skills 2000 + by The Conference Board of Canada's Employability Skills Forum Board of Canada, along with the changes and because of different purpose or situation where the research will conducted so the objective of this study was to identify and confirm the constructs and dimensions of employability skills that can predict the work performance (ESWPP) of Electronic Polytechnic Graduate in Electrical and Electronics Industry to fulfill research requirement.

2. PROBLEM STATEMENT

Employers nowadays stressed that graduates lack employability skills required by employers (Fairuzza et al., 2011; Ahn et al., 2012; Abdul, 2012; Ministry of Higher Education, 2012b). Employers think that graduates are not ready to enter and confront the complexities and challenges of the world of work (Freudenberg et al., 2011; Tymon, 2011; Marais and Perkins, 2012) and the resulting unwillingness of graduates are not proficient in the implementation of work task (Tetreault, 1997). Employers believe that education institutions is the most responsible to equip graduates with employability skills. However, the skills, behaviors and attitudes required by the prospective employees are different from what is taught during the study. Different perceptions result in a gap between the knowledge, skills and qualities required by employers with what was dominated by graduates (Rohaizat et al., 2012) increase a unemployment rate.

Tracer study report 2011 issued by the Ministry of Higher Education shows that the percentage of polytechnic engineering graduates who are still unemployed in 2011 was 63.8% (Ministry of Higher Education, 2012a). The issue of unemployment in Malaysia is not because of lack of employment opportunities, but is due to poor quality of graduates (Zaliza and Mohd, 2014; Normala et al., 2014). Yahya (2004) view that graduates good technical skills, without having employability skills are considered not to be quality. A review studies done by Thangiah (2008) reveal that one of the factors contributing to the unemployed graduates in Malaysia is a "skills mismatch" where graduates do not have the skills sought by potential employers.

This is happen because there is no consensus on the exact inventory of employability skills needed by graduates for the industry electric and electronics because even though various companies in the same industry sector, they have their own specific employability skills need (Pillai et al., 2012). Industrial demand will not be satisfied as long as the clear specification of properties that need to be established or the characteristics of workers who may not be completed (Ministry of Higher Education, 2012b). Shweta (2012) mention that the gap in terms of ensuring that the industry will be met by the continued development of the skills of the workforce.

Therefore, this study aims to identify and confirm the constructs and dimensions of ESWPP of Electronic Polytechnic Graduate

in Electrical and Electronics Industry to provide exact inventory of employability skills needed by graduates for the industry electric and electronics. The findings will be used to further empower collaboration, industrial services and employment center function by providing training about employability skills to polytechnic engineering graduate that actually required by the employer and most significant effect on the job performance to reduce the unemployment rate among engineering graduates of the polytechnic.

3. RESEARCH QUESTIONS

The research questions are as follows:

1. What is constructs and dimensions of employability skills required by employers electrical and electronics industry in Malaysia based on analysis document.
2. What is constructs and dimensions of employability skills which can predict the performance of an employee in the electrical and electronics industry in Malaysia from perspective employers and institutions.

4. METHODOLOGY

A triangular qualitative approach was used in the early stages in the development of research constructs and dimensions ESWPP of document analysis and expert interview protocol from Electrical and Electronic Industry and institution perspective. Document analysis was analyzed using frequency matrices tables and interview data involving experts from industry and institution were analyzed using Fleiss Kappa reliability. Fleiss Kappa reliability analysis is used to determine the overall dimensions of the approval index for each construct ESWPP. The findings of the overall Kappa coefficient value at 0.91 and 0.99 for the industry and the academia, which indicates the level of agreement, is very good. The results showed that the constructs and dimensions ESWPP is communication skills, personal qualities, teamwork skills, critical thinking skills and problem solving, technology skills, organizational skills and learning skills.

Scale Fleiss Kappa agreement are as follows (Table 1a):

5. RESULT AND DISCUSSIONS

5.1. Document Analysis and Expert Interviews Construct Formation of ESWPP

Based on the comments and literature citations are shown in Table 1b, the researcher has a list of the main constructs

Table 1a: Scale Fleiss Kappa agreement

κ	Interpretation
<0	Poor agreement
0.01-0.20	Slight agreement
0.21-0.40	Fair agreement
0.41-0.60	Moderate agreement
0.61-0.80	Substantial agreement
0.81-1.00	Almost perfect agreement

Source: Landis and Koch (1977)

that are frequently mentioned by among famous model of employability skills throughout country as a construct of ESWPP are communication skills, personal qualities, teamwork skills, critical thinking and problem solving skills, technology skills, organizational skills and continuously learning skills.

Table 1c have shown a result from interview sessions with five Electric and Electronic Human Resources Officer in Malaysia regarding their opinion about which construct of employability skills that they were concerned and really need acquisition show up by graduate especially graduate electronic polytechnic during interview session.

Table 1d have shown a result from interview sessions with five content expert come from several university regarding their opinion about which construct of employability skills that our graduate especially graduate electronic polytechnic should possess for job hunting success.

Based on the findings of the analysis of documents and expert interview protocol, it can be stated that the constructs ESWPP

include communication skills, personal qualities, teamwork skills, critical thinking and problem solving skills, technology skills, organizational skills and continuously learning skills. Therefore, the formation of these elements may be continued to establish the dimensions of the constructs ESWPP.

5.2. Findings Document Analysis Creation Construct Dimensions of ESWPP

5.2.1. Expert insights interviews formation of construct dimensions of ESWPP

From a documents analysis shown in Table 1e it shows the list of the 27 main dimensions that are frequently mentioned in famous model of employability skills throughout country and used as formation dimensions for development of the constructs for ESWPP. Suitable dimensions for Communication Skills construct are effective reading strategies, effective writing strategies, using numeracy effectively, effective listening skills, effective speaking skills and share information using a range of information and communications technology. Dimensions for Personal Qualities construct are responsibility, self-esteem and self-management. Mean while dimensions for teamwork skills are work independently and as part of a team, coaching and mentoring

Table 1b: Document analysis comparison for constructs formation of ESWPP

Employability skills construct summary	The conference board of Canada (2000) Employability Skills 2000+	SCANS (2001)	European union (EU) (DEST 2002)	Australian government department of education employment and workplace relations (2008)	STEMNET (2015)	Total score
Communication skills	√	√	√	√	√	5/5
Personal qualities	√	√	√	√	√	5/5
Teamwork skills	√	√	√	√	√	5/5
Critical thinking and problem solving skills	√	√	√	√	√	5/5
Technology skills	√	√	√	√	-	4/5
Organizational skills	√	√	√	√	√	5/5
Continuously learning skills	√	-	√	√	√	4/5

ESWPP: Employability skills based work performance prediction, SCANS: Secretary's Commission on Achieving Necessary Skills

Table 1c: Table comparison of constructs of ESWPP from the employer expert perspective

Employability skills construct summary	Company (1)	Company (2)	Company (3)	Company (4)	Company (5)	Total score
Communication skills	√	√	√	√	√	5/5
Personal qualities	√	√	√	√	√	5/5
Teamwork skills	√	√	√	√	√	5/5
Critical thinking and problem solving skills	√	√	√	√	√	5/5
Technology skills	√	√	√	√	√	5/5
Organizational skills	√	√	√	√	√	5/5
Continuously learning skills	√	√	√	√	√	5/5

ESWPP: Employability skills based work performance prediction

Table 1d: Table comparison of constructs formation of ESWPP from the institution expert perspective

Employability construct summary	Content expert (1)	Content expert (2)	Content expert (3)	Content expert (4)	Content expert (5)	Total score
Communication skills	√	√	√	√	√	5/5
Personal qualities	√	√	√	√	√	5/5
Teamwork skills	√	√	√	√	√	5/5
Critical thinking and problem solving skills	√	√	√	√	√	5/5
Technology skills	√	√	√	√	√	5/5
Organizational skills	√	√	√	√	√	5/5
Continuously learning skills	√	√	√	√	√	5/5

ESWPP: Employability skills based work performance prediction

Table 1e: Comparison of document analysis creation construct dimensions of ESWPP

Employability skills construct	Employability skills dimension	Comparative employ ability skills model by country that needed by employers of industry						
		The conference board of Canada (2000) Employability Skills 2000+	SCANS (2001)	European Union (EU) (DEST 2002)	Australian government department of education employment and workplace relations (2008)	STEM NET (2013)	Total score	
Communication skills	Effective reading strategies	√	√		√		3/5	
	Effective writing strategies	√	√	√	√	√	5/5	
	Using numeracy effectively	√	√		√		3/5	
	Effective listening skills	√	√		√	√	4/5	
	Effective speaking skills		√		√	√	3/5	
	Share information using a range of information and communications technologies	√	√		√		3/5	
Personal qualities	Responsibility		√	√	√		3/5	
	Self-esteem	√	√		√	√	4/5	
	Self-management	√	√		√	√	4/5	
Teamwork skills	Work independently or as part of a team	√	√	√	√		4/5	
	Coaching and mentoring skills	√	√		√		3/5	
	Serves clients @ customers	√	√	√		√	4/5	
	Exhibits leadership	√	√		√		3/5	
	Flexibility	√	√		√		3/5	
	Works with cultural diversity	√	√		√	√	4/5	
Critical thinking and problem solving skills	Applies creative, innovative and practical solutions	√	√		√		3/5	
	Applies decision-making strategies	√	√	√	√	√	5/5	
	Recognizes and solves problems	√	√	√	√	√	5/5	
Technology skills	Selects technology	√	√	√	√		4/5	
	Applies technology to task	√	√		√		3/5	
Organizational skills	Utilizing Resources		√		√	√	3/5	
	Manages Time							
	Manages Money							
	Manages materials/facilities							
	Manages human resources							
	Planning process	√			√	√	3/5	
	Adapt to changing requirements and information	√		√	√		3/5	
	Continuously monitor the success of a project or task and identify ways to improve	√				√	3/5	
	Continuously learning skills	Having enthusiasm for ongoing; learning	√			√	√	3/5
		Managing own learning	√		√			3/5
Assess personal strengths and areas for development		√		√			3/5	

ESWPP: Employability skills based work performance prediction, SCANS: Secretary’s Commission on Achieving Necessary Skills

skills, serves clients or customers, exhibits leadership, flexibility and works with cultural diversity.

Applies creative, innovative and practical solutions, applies decision-making strategies and recognises and solves problem are formation for critical thinking and problem solving skills. technology skills construct consists of select technology and applies technology to task. Dimensions for organisational skills construct are utilizing resources such as manages time, manages money, manages materials facilities, manage human resources. Planning process, adapt to changing requirements and information and continuously monitor the success of project or task and identify ways to improve are also dimensions included in organisational

skills construct. Lastly dimensions for continuously learning skills construct are having enthusiasm for ongoing learning, managing own learning and assess personal strengths and areas for development.

Table 1f have shown a result from interview sessions with five Electrical and Electronic Human Resources Officer in Malaysia regarding their opinion about dimensions construct of employability skills that polytechnic graduate should acquire in order to make sure they can do the work. Almost the 27 dimensions are agreed by them to perform dimensions of the construct of ESWPP. Table 1g have shown a result from interview sessions with content expert from institution. Majority of them agreed

Table 1f: Comparison of expert insight interviews for formation of construct dimensions of performance prediction based on employability skills from the industry perspective

Employability skills construct	Employability skills dimension	Comparative employability skills that needed by employers of electrical and electronic industry in Malaysia					Total score
		Company (1)	Company (2)	Company (3)	Company (4)	Company (5)	
Communication skills	Effective reading strategies		√	√	√	√	4/5
	Effective writing strategies	√	√	√	√	√	5/5
	Using numeracy effectively		√	√	√	√	4/5
	Effective listening skills	√	√	√	√	√	5/5
	Effective speaking skills	√	√	√	√	√	5/5
Personal qualities	Share information using a range of information and communications technologies	√	√	√	√	√	5/5
	Responsibility	√	√	√	√	√	5/5
	Self-esteem	√	√	√	√	√	5/5
	Self-management		√	√	√	√	4/5
	Work independently or as part of a team	√	√	√	√	√	5/5
Teamwork skills	Coaching and mentoring skills		√	√	√	√	4/5
	Serves clients @ customers		√	√	√	√	4/5
	Exhibits leadership		√	√	√	√	4/5
	Flexibility	√	√	√	√	√	5/5
	Works with cultural diversity	√	√	√	√	√	5/5
Critical thinking and problem solving skills	Applies creative, innovative and practical solutions	√	√	√	√	√	5/5
	Applies decision-making strategies	√	√	√	√	√	5/5
	Recognizes and solves problems	√	√	√	√	√	5/5
Technology skills	Selects technology		√	√	√	√	4/5
	Applies technology to task		√	√	√	√	4/5
Organizational skills	Utilizing resources	√	√	√	√	√	5/5
	Manages time						
	Manages money						
	Manages materials/facilities						
	Manages human resources						
	Planning process		√	√	√	√	4/5
	Adapt to changing requirements and information		√	√	√	√	4/5
	Continuously monitor the success of a project or task and identify ways to improve		√	√	√	√	4/5
	Continuously learning skills		√	√	√	√	4/5
	Having enthusiasm for ongoing; learning		√	√	√	√	4/5
Managing own learning		√	√	√	√	4/5	
Assess personal strengths and areas for development		√	√	√	√	4/5	

with 27 dimensions of construct for ESWPP and suggested that the dimension coaching and mentoring for construct Teamwork Skills need to be split up into two dimension because it brings a different meaning and approach and because the number of the dimensions is now 28.

Based on the analyzes and opinion from the experts that were conducted as described above, researchers have identified a finding that led to the formation of 28 dimensions contained in the seven constructs. Through the process of analyzing these data, the constructs of the ESWPP required by the electrical and electronics industry in Malaysia which can improve work performance can be recognized and confirmed as constructs for the ESWPP. The elements and dimensions have been reviewed by five experts whereby the approval has been granted. It is also based on the Fleiss qualitative research where the five people involved are

specialized in the qualitative research methods and the content of the study. In this study, the equation obtained is

$$K = (Pa - Pc) / (1 - Pc)$$

K = Kappa value

Pa = Observed agreement

Pc = Chance agreement

The findings of Fleiss Kappa coefficient values as a whole is 0.91 and 0.99 for the industry and the academia indicating a very good level of agreement.

Table 1g: Comparison of expert insight interviews for formation of construct dimensions of performance prediction based on employability skills from the institution perspective

Employability skills construct	Employability skills dimension	Comparative employability skills that needed by employers of electrical and electronic industry in Malaysia (Academician expert perspective)					
		Content expert (1)	Content expert (2)	Content expert (3)	Content expert (4)	Content expert (5)	Total score
Communication skills	Effective reading strategies	√	√	√	√	√	5/5
	Effective writing strategies	√	√	√	√	√	5/5
	Using numeracy effectively	√	√	√	√	√	5/5
	Effective listening skills	√	√	√	√	√	5/5
	Effective speaking skills	√	√	√	√	√	5/5
	Share information using a range of information and communications technologies	√	√	X	√	√	4/5
Personal qualities	Responsibility	√	√	√	√	√	5/5
	Self-esteem	√	√	√	√	√	5/5
	Self-management	√	√	√	√	√	5/5
Teamwork skills	Work independently or as part of a team	√	√	√	√	√	5/5
	Coaching and mentoring skills	√	√	√	√	√	5/5
	Serves clients @ customers	√	√	√	√	√	5/5
	Exhibits leadership	√	√	√	√	√	5/5
	Flexibility	√	√	√	√	√	5/5
	Works with cultural diversity	√	√	√	√	√	5/5
	Applies creative, innovative and practical solutions	√	√	√	√	√	5/5
Critical thinking and problem solving skills	Applies decision-making strategies	√	√	√	√	√	5/5
	Recognizes and solves problems	√	√	√	√	√	5/5
	Applies technology to task	√	√	√	√	√	5/5
Technology skills	Selects technology	√	√	√	√	√	5/5
	Applies technology to task	√	√	√	√	√	5/5
Organizational skills	Utilizing resources	√	√	√	√	√	5/5
	Manages time						
	Manages money						
	Manages materials/facilities						
	Manages human resources						
	Planning process	√	√	√	√	√	5/5
	Adapt to changing requirements and information	√	√	√	√	√	5/5
	Continuously monitor the success of a project or task and identify ways to improve	√	√	√	√	√	5/5
	Having enthusiasm for ongoing; learning	√	√	√	√	√	5/5
	Managing own learning	√	√	√	√	√	5/5
Assess personal strengths and areas for development	√	√	√	√	√	5/5	

6. CONCLUSION

It was shown in this study that the analysis and opinion from the experts led to the formation of 28 dimensions consisted in seven constructs. It was also further shown that through the process of analyzing those data, the constructs of the ESWPP required by the electrical and electronics industry in Malaysia which can potentially improve the work performance can be recognized and confirmed as constructs for the ESWPP. The equation obtained in this study also shows that the equation obtained with the Fleiss Kappa coefficient values as a whole at 0.91 and 0.99 for the industry and the academia indicating a very good level of agreement. In overall, the findings from the tringular approach which involved the analysis of documents and the expert perspective garthered

form the industry and institution interviews demonstrated that the construct protocols for the ESWPP are communication skills, personal qualities, teamwork skills, critical thinking and problem solving skills, technology skills, organizational skills, and continuously learning skills.

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