Graduate Employability For Manufacturing Industry

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Abstract

Previous researches on employability skills conducted nationally and internationally, found that many technical graduates lacked employability skills. This article reports on the study of employability skills that graduate of manufacturing students should acquire to be employed and sustain in manufacturing industries. The study investigates the importance of employability skills as perceived by employers from manufacturing industries. The findings of the study showed that employers place great importance to communication skills, problem solving skills, team work skills and personal qualities. Graduates also need to emphasis on leadership skill, entrepreneur skill, technology skill and informational skills.

1. Employability Skills Concept and Construct

Employability skill is often defined as the preparation for graduates to successfully get jobs and to develop in their careers [1], and enable individuals to prove their value to an organization as the key to job survival [2]. The background theory that always related to employability skills development is the human capital theory, which states ‘employability’ is not only about shaping talent, techniques, and experience for an individual to get a job, but more toward the ability to do the work [3].

Industry analysts reported that for success in the workplace, employees need to possess a specific employability skills entry level requirement. These essential (employability) skills were often viewed as a

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company’s most important raw material [4] and graduates with employability skills will have an advantage in getting jobs in the industry [5].

The Secretary’s Commission on Achieving Necessary Skills [6] identified five competencies important of employability skills which are 1) identifying, organizing, planning, and allocating resources, 2) working with others, 3) acquiring and using information, 4) understanding complex interrelationships, and 5) working with a variety of technologies. SCANS also categorizes foundational skills into three groups that is basic skills, thinking skills and interpersonal qualities. Mayers model of employability skills [7], listed seven elements of the employability skills which are to collect and analyze information, communication of ideas and information, planning and organizing activities, working with others in groups, using mathematical ideas and techniques, solve problems and use technology.

Early 1990s, The Conference Board of Canada [8] developed the Employability Skills Profile (ESP) which composed of three parts, academic skills, personal management skills and teamwork skills. Then in 1994, Human Resources Skills Development of Canada created a nine essential elements; text reading skills, using a document, writing, numbers, communicate with thinking skills, working with others, using computers and continuous learning. Efforts to develop these skills continued with the improvements of Employability Skills 2000+ which combines elements of employability skills and Essential Skills. The skills which were found in this model are: core skills: communication, manage information, use numbers & think and solve problems; personal management skills; attitude and positive behavior, responsible, adaptation, continuous learning & work safely; teamwork skills; working with others & participate in projects and assignments. Employability Skills 2000+ has three elements of employability skills and key skills, which are: basic skills: communication, information management, mathematics, critical thinking and problem solving, self-management skills; have a positive attitude and behavior, responsible, adaptive, lifelong learning, work safely; teamwork skills; working with others, participate in projects and assignments.

Research done by the Australian Council of Educational Research (ACER) [9], suggested skills which appear to contribute to employability are: communication skills, thinking skills, learning skills, skills in managing projects and priorities, skills in working with and understanding systems, skills in applying & using information technology, leadership skills, personal and interpersonal skills and attributes. Kearns Model of Employability Skills [10], divided individuals into four generic skills that group work and the nature of work readiness of individuals: 1) knowledge of the entrepreneurial, 2) creative and innovative, 3) have the skills of interpersonal and thinking, and 4) willingness to learn.

Malaysian Qualification Agency (MQA) [11] in the Malaysian Qualifications Framework (MQF), outlined eight domains to be mastered by students, including non-technical skills and techniques as follows: knowledge in the areas studied, practical skills, social skills and responsibility, the value, attitude and professionalism, communication skills, leadership and teamwork, scientific problem-solving skills, entrepreneurial and management skills, lifelong learning skills and information management. Meanwhile Ministry of Higher Education (MOHE) [12] identifies generic skills across multiple domains of learning and skills group of personal aspects. University graduates should possess these skills to meet labor market needs and challenges of everyday life. Mastery of soft skills among the graduates will be able to compete in the job market. In principle, all public universities in Malaysia should adopt all seven elements of the soft skills. Elements of soft skills by MOHE include: communication skills, critical thinking skills, teamwork skills, continuous Learning, Entrepreneurship, ethical and moral professional skills, and leadership skills.

2. Do employability skills really matter in the industries?

Employability issues are at the very core of contemporary in higher education. The study by Cranmer [13] showed that the finding could well reflect a degree of ‘mismatch’ for some United Kingdom graduates between the skills acquired at university and the skills they are required to use in employment. Ramlee & Greenan [14],

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Cotton [15], through their research on developing employability skills of technical graduates in Malaysia and United States, found technical graduates had mastered their technical skills but employers however felt dissatisfied with their employees motivational skills, communication skills, interpersonal skills, critical thinking, problem solving and entrepreneurship skills.

Fitrisehara [16] summarized that the employability skill level of students in the Technical and vocational Training centre in Malaysia is moderate. The aspect that has the lowest score is the aspect of information skill while the aspect that has the highest score is the aspect of personal quality. Meanwhile investigation on the undergraduates’ core competencies ability in private university in Malaysia, shows that the undergraduates were all highly competent in personal qualities and skills, however, such skills as critical analysis, planning, problem solving, oral communication, decision making, and negotiating report a slightly higher level of mismatch between employers’ and undergraduates’ perception [5].

Nonetheless, so far, there is no specific empirical data regarding indicator of employability skill for manufacturing industries. The purpose of this study is to determine the important aspects of employability skills as perceived by manufacturing employers to act as a guide for graduate to emphasis on, and considered important to be acquired before working in the manufacturing industry.

3. Methodology

This study used a quantitative and qualitative approached. The quantitative data analyses for this study were obtained through questionnaires and the qualitative part of analysis is done through interviews. 107 employers were given a set of questionnaires on employability skills. Interview is done with 15 employers to triangulate the findings from the descriptive analysis.

Employers participating in this research was, Operational Manager (49.3 percent and a majority) Supervisor (39.3 percent) and Chief Executive (11.2 percent). The employers’ experience distributions were: 33.7 percent 6-10 years, 22.4 percent 3-5 years, 21.5 percent more than 20 years, 19.6 percent around 11-15 years, and 2.8 percent less than two years.

The employers were grouped into five type of manufacturing industry, which was: electrical and electronic product (E & E), metal based products (MB), machinery and equipment (ME), transport equipment (TE), and other kinds of product industry (OT). The type of company was based on the MIDA’s categorization of manufacturing industry in Malaysia [17].

4. Results and Discussion

Table 1 are the cumulative result of the skills set of employability skills as perceived by the employers in the Malaysian manufacturing industry. The results from the descriptive analysis are then triangulated using interviews with employers. Discussions of the findings are discussed below.

<table>
<thead>
<tr>
<th>Skills</th>
<th>Employability Skills Aspects</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Communication Skills</td>
<td>Read and interpret written information in documents (etc. manuals, graphs, and schedules)</td>
<td>4.21</td>
<td>0.56</td>
</tr>
<tr>
<td></td>
<td>Write to communicate thoughts, ideas, information, and messages.</td>
<td>4.20</td>
<td>0.53</td>
</tr>
<tr>
<td></td>
<td>Listen and respond to verbal messages and other cues such as body language</td>
<td>4.35</td>
<td>0.69</td>
</tr>
<tr>
<td></td>
<td>Speak and participate in conversation, discussion, and group meeting.</td>
<td>4.13</td>
<td>0.65</td>
</tr>
<tr>
<td>Problem Solving Skills</td>
<td>Creative/Innovative thinking to generates new ideas</td>
<td>4.63</td>
<td>0.66</td>
</tr>
<tr>
<td></td>
<td>Decision Making in choosing best alternatives</td>
<td>4.26</td>
<td>0.55</td>
</tr>
<tr>
<td></td>
<td>Problem solving in able to identify and analyse problems</td>
<td>4.79</td>
<td>0.73</td>
</tr>
</tbody>
</table>
Seeing things in the mind’s eye which being able to visualize and interpret various type of information.  

<table>
<thead>
<tr>
<th>Informational Skills</th>
<th>Score</th>
<th>Standard Deviation</th>
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</thead>
<tbody>
<tr>
<td>Acquire relevant information from various sources.</td>
<td>4.60</td>
<td>0.66</td>
</tr>
<tr>
<td>Manage acquired information.</td>
<td>3.73</td>
<td>0.55</td>
</tr>
<tr>
<td>Share ideas and willing to share new ideas.</td>
<td>3.85</td>
<td>0.73</td>
</tr>
<tr>
<td>Learn independently.</td>
<td>4.01</td>
<td>0.61</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Team Work Skills</th>
<th>Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participates as a member of a team: works cooperatively with others and contributes to group with ideas, suggestion and effort.</td>
<td>4.42</td>
<td>0.57</td>
</tr>
<tr>
<td>Guiding/Coaching team members: help others in learning necessary knowledge and skills</td>
<td>4.62</td>
<td>0.60</td>
</tr>
<tr>
<td>Discussion that involves exchanging specific resources or resolving divergent interest</td>
<td>4.98</td>
<td>0.66</td>
</tr>
<tr>
<td>Work with cultural diversity: works well with multi-ethnic, different social or educational backgrounds.</td>
<td>4.64</td>
<td>0.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Technology Skills</th>
<th>Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Select and applies technology related to task</td>
<td>4.31</td>
<td>0.69</td>
</tr>
<tr>
<td>Have basic computer skills</td>
<td>4.00</td>
<td>0.62</td>
</tr>
<tr>
<td>Maintain technology</td>
<td>4.47</td>
<td>0.69</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Entrepreneur Skills</th>
<th>Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Business opportunity which able to identify business opportunity</td>
<td>4.59</td>
<td>0.55</td>
</tr>
<tr>
<td>Ability to work with minimal or without supervision:</td>
<td>4.38</td>
<td>0.66</td>
</tr>
<tr>
<td>Managing resources</td>
<td>4.08</td>
<td>0.55</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Leadership Skills</th>
<th>Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead team members.</td>
<td>4.40</td>
<td>0.73</td>
</tr>
<tr>
<td>Motivate team members.</td>
<td>4.80</td>
<td>0.61</td>
</tr>
<tr>
<td>Able to resolve conflict.</td>
<td>4.61</td>
<td>0.66</td>
</tr>
<tr>
<td>Taking responsibility for themselves and others.</td>
<td>4.35</td>
<td>0.55</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Personal Qualities</th>
<th>Score</th>
<th>Standard Deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Responsibility to job</td>
<td>4.38</td>
<td>0.66</td>
</tr>
<tr>
<td>Self-esteem and maintain positive</td>
<td>4.08</td>
<td>0.55</td>
</tr>
<tr>
<td>Sociability</td>
<td>4.40</td>
<td>0.73</td>
</tr>
<tr>
<td>Honesty and high integrity</td>
<td>4.80</td>
<td>0.61</td>
</tr>
<tr>
<td>Commitment and work hard towards goal</td>
<td>4.61</td>
<td>0.66</td>
</tr>
<tr>
<td>Adaptability to working environment</td>
<td>4.35</td>
<td>0.55</td>
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4.1 Communication Skills

From the descriptive analysis, communication skills obtained a high score on its importance. Comments from the employer’s interviews supported this result commenting that graduates:

‘…should be able to interpret manuals and written information such as manuals, graphs, and schedules to perform tasks and relaying information via writing are very crucial.
‘…ability to interpret information from supervisors is very important and necessary.’

‘…communication in project team and everyday operations team is what we want.’

‘…one needs to listen in order to find out the best way to fulfill the assignment required.’

In many manufacturing industry contexts an important aspect of communication skill revealed that employees need to be skillful in communicating with people from a variety of ethnic backgrounds [18] and placed different emphasis on the different forms of communication McLeish [19]. Sometimes verbal communication was
emphasized, others written communication. Employers need employees who could not only read and write but also be able to explain in a manner easily understood for complex concepts.

Communication is aimed to support everyday operations and the capacity to establish rapport, gain commitment and be persuasive is all highly valued in such settings. From the interviews employers sees communication skills as being able to clearly and concisely articulate thoughts and suggestions. Employers also stressed employees need to have listening skills to accompany their verbal skills. Listening is particularly valued in manufacturing industry, in receiving feedback, and in seeking to understand the requirements.

4.2 Problem Solving Skills

The next most important employability skills and has the highest mean score (4.26-4.79) is the problem solving skills. From the interviews, employers indicated problem solving skills were essential. An employee with sound problem solving skills could demonstrate good creative/innovative, decision making, problem solving and reasoning skills. Comments made from a few of the manufacturing industry employers were:

‘…we need someone that really creative but a lot of employees have difficulty in identifying new ideas, and making connections between related ideas or reshape goals.’

‘…we always looking for employees that can demonstrate ability to organize and interpret process symbols, pictures, graphs, objects and other information accurately. Having difficulty in demonstrating ability to these will cause a lot of trouble.’

‘…employees who can evaluate alternative ideas thoroughly and recommend solutions are the one that we want. Have difficulty in evaluating alternative ideas is problem.’

‘…employee must show initiative in problem solving rather than rely on others. As an international company we need employees that can resolve problems and create good outcomes.’

Problem solving skills are knowledge gained from useful information in daily activities. According to Emery (1999), employers suggested the mix of problem solving skills required would vary according to the level of complexity of the job and the types of problem employees would encounter.

4.3 Informational Skills

For the informational skills aspect of managed and acquired information and share ideas showed a moderate mean score (mean = 3.73). Employers also stated that planning and organizing skills is important, employees need to be independent and good at time management and manage priorities in order to survive because they know when to work alone and when to ask for support. Through the interviews the comments gathered are, graduates or employees should be able to:

- Retrieve relevant information from various sources.
- Always analyze and integrate acquired information with own ideas.
- Organizes, processes, and maintains written or computerized records and other forms of information in a systematic fashion.
- Frequently share ideas and resources. Selects and analyzes information and communicates the results to others using oral, written, graphic, pictorial, or multi-media methods.
- Demonstrate the ability to learn independently with minimum supervision.
4.4 Team Work Skills

Team work skills set mean score is high ranging from 4.42 for participate as a team member and to 4.98 for the aspects of discussion that involves specific resources. Meanwhile from the interviews several employers emphasized that graduates should perform the following team work skills:

‘…employees must always participate actively and able to cooperate with others. Consistently provide information, contribute suggestions and ideas to the team.’

‘…one must share knowledge and skills with team members. Always respect and encourage each other.’

‘…our country is multi-racial so we need employers that can work together effectively and harmoniously with multi-ethnic, different social or educational backgrounds.

‘…new employee starting work would normally get involved in a project, working with seniors. So it is important for them to be able to collaborate in a team. We conduct group discussion almost every day and focused on project development.’

Graduates who would like to be employed in manufacturing industry are expected to be collaborative and participative. These statement is supported by McLeish [19] and Alston [20] where employer stress that every position in any size of industry requires some kind of teamwork hence it is essential for employees to understand cultural, gender and age factors in ensuring effective teamwork. The skill to be able to transfer between individual work and team work is an advantage and concern interpersonal skills.

4.5 Technology Skills

Survey from the employers showed that technology skills is also essential in new and modern technology as mentioned by Taylor [21], technology in manufacturing industry is going through rapid changes and using a range of new technologies cut across all aspects of their production. Thus, employers insist on new and existing employee to be able to use technology to do their work and would need to consider how technology could apply and used to benefit the business. From the interviews, employers advised it would be necessary for employees to select and apply technology related to task; have basic computer skills; and maintain technology. Comments made by employers from these studies gave the same impression on technological skills:

‘…we seek for employees with at least an understanding to procedures for operating machines, including computers and their programming.’

‘…employee must know how to select and choose which set of procedures, tools or machines, including computers to use.’

‘…reliance on technology is increasing. It’s crucial to understand and maintain the system. Every process of manufacturing uses technology. It is always changing and employees have to seek for skills very fast.’

The application of technology to perform tasks among employees who serve in the production field is very significant as contemporary industries used various latest technologies to simplify work. Bunn and Stewart [22]
stated that technical board members agreed with the fact that the skills to use technologies are crucial in the industry, and De Leon and Borchers [23] noted that the application of technologies to carry out duties is highly required.

4.6 Entrepreneur Skills

Entrepreneur skill is one of the elements which employer always looks for in graduates. Both descriptive analysis and interviews place an importance on the ability to work with minimal supervision and managing resources as well as taking business opportunity. The employers interviewed suggested that industries no longer just relied on managers and specialists to take the initiative in developing the business but it is a collective effort from everyone in the industry.

The following comments gathered from employers on this matter are as follows:

‘…we need someone that can contribute more than one potential business ideas.’

‘…managers and employees must manage time effectively and reducing process times and how to save money.’

‘…completing projects on time and within budget, using appropriate resources in order to achieve agreed quality standards, and reordering competing priorities to achieve project outcomes.’

The identification of initiatives and enterprise skills as critical employability skills reflects new perspective from employers. Graduates in manufacturing field need to be exposed to business and industrial world in order to understand more.

4.7 Leadership Skills

The ability to lead is very important in any occupations. Result from the descriptive analysis showed that the mean score is 4.35 to 4.80. All of the companies emphasized the importance of leadership throughout the organisation unlike more traditional organisations, where leadership is typically associated with people at senior levels. Leadership is also about full and ongoing accountability, the capacity to work autonomously. As industries reflected on leadership in the organisation they talked of employees acting in particular ways in the workplace:

• Able to lead team members.
• Able to motivate team members.
• Able to resolve conflict.
• Taking responsibility for themselves and others.

4.8 Personal Qualities

From the descriptive analysis aspect of personal quality overall has high mean score (4.08-4.80). Employers feel that personal values are important no matter what is their academic qualification. The main personal qualities that were mentioned by employers are:
‘...honesty is very important; in fact it’s the most important thing above everything else. We need employees that can be trusted, display high standards of ethical.’

‘...we also looking for student with high responsibility-work hard toward goals attainment and displaying a high level of concentrations.’

‘...student with high self-esteem is very important. We don’t see graduates with this, and we believe in own self and maintains a positive view, is crucial.’

‘...employees must demonstrate understanding, friendliness, empathy and politeness in new and on-going group settings.’

‘New employees must be open to change and must be fast to adapt behavior or work in.’

‘Industry needs people that are loyal to the industry, have desire to work, genuineness and honesty, reliability, punctuality and physical fitness.’

These values are seen to contribute to harmony and productivity within workplace and to developing good relations with customers. Employers clarified that industry need flexible workers who are able to face any challenges in workplace and working with various races, cultures and languages as employees must be willing to cooperate.

5. Conclusion

In this study, the result showed that employers place great importance to most of the employability skills. Therefore, instructors should inculcate the employability skills to students. The results of these findings can be useful as a guide for technical instructors or lecturer to plan which employability skill should be emphasis, and considered important to be acquired by graduates before working in the industry. The findings can also be useful to graduates or job seekers in the manufacturing industry to be prepare on the expectation of these employers.

Given the high value of communication skills and problem solving skills perhaps employers would like to see these skills incorporated more into the curricula and will give more impact to the working world. Employers felt that these skills are very important and give a very high impact to the industry. Related to resource skills, employers indicated that the ‘financial management’ is important. Technical students are encouraged to get involved in in financial management.

Employers indicated that all aspects of system and technology are important. The application of technology to perform tasks among employees who serve in the production field is very significant as industries used various latest technologies to simplify work. It is crucial to develop these skills for technical student. As for the aspect of personal quality, the item ‘adaptability and flexibility” is moderately important to employers but it is an advantage for student to have because with these skills students are able to face any challenges in the workplace.
References


