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The Marketability of UKM Chemistry Students from Industrial Training Perspective

Abd Karim, N. H.[1]*, Nor, F. M.[1], Arsad, N.[2], Hassan, N. H.[1], Baharum, A.[1], Khalid, R.[1], Anuar, F. H.[1], Abu Bakar, M.[1] and Othaman, R.[1]

[1]School of Chemical Sciences and Food Technology, Faculty of Science and Technology, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia
[2]Department of Electrical Electronic and Systems Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia

ABSTRACT

Industrial training is a compulsory subject that has to be taken by all chemistry students in the School of Chemical Sciences and Food Technology, Faculty of Science & Technology, Universiti Kebangsaan Malaysia. The objective of the study is to identify the marketability of UKM Chemistry students from three different programmes based on the perception of industrial training supervisors. One hundred and eighty industrial supervisors evaluated the students at the end of the training by means of a set of questions that covered attitude, managerial skills and technical skills. SPSS and the Rasch model were used to analyse the data from two consecutive years. Overall, all the students from three different programmes did well and met the evaluation criteria in both years. However, innovation and problem-solving skills need to be improved. Therefore, subjects to improve soft skills should be introduced into the curriculum.

Keywords: Chemistry students, industrial training, marketability, UKM

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E-mail addresses:
nurulhuda@ukm.edu.my (Abd Karim, N. H.),
farhanmnor@gmail.com (Nor, F. M.),
norhana@eng.ukm.my (Arsad, N.),
syareeda@ukm.edu.my (Hassan, N. H.),
azeiss@ukm.edu.my (Baharum, A.),
rozida@ukm.edu.my (Khalid, R.),
farahhannan@ukm.edu.my (Anuar, F. H.),
muntaz@ukm.edu.my (Abu Bakar, M.),
rizafizah@ukm.edu.my (Othaman, R.)
* Corresponding author

INTRODUCTION

Graduating from a university with good academic results is not a guarantee of a job in the open market in Malaysia. Every year, tens of thousands of students graduate from universities all over the country. Add to this number the graduates from overseas and the numerous university colleges in Malaysia. The increasing number of graduates every year has now led to the rise

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of unemployment among graduates from public and private institutions in Malaysia (Ahmad et al., 2012).

Unemployment is a problem related to the marketability of graduates. Marketability or employability has been defined as a set of skills, knowledge and personal attributes that enhance individual likelihood of gaining employment and being successful in one's chosen occupation(s) to the benefit of oneself, the workforce, the community and the economy (Samuel & Ramayah, 2016). Graduates must possess certain skills in order to be able to compete with others in the open market. The service sector in particular, requires graduates who possess the right soft skills such as communication and interpersonal skills. Thus, it is important for undergraduates to acquire these soft skills during their time in higher learning (Krish et al., 2012; Hanafi et al., 2014). The Prime Minister has emphasised the need to create new generations of Malaysians endowed with creative and innovative minds, as well as the ability to think out of the box and resolve problems. The Prime Minister's concern is also shared by many stakeholders, particularly employers who have to deal with the thousands of graduates pouring out of the numerous higher education institutions every year, who do not seem to fit the criteria listed by the Prime Minister (Singh et al., 2014). These concerns are not new (Pianin, 2014; Lau, et al., 2015).

The objective of this study is to determine the marketability of chemistry students from Universiti Kebangsaan Malaysia based on the perception of potential employers. Survey forms were given to supervisors of undergraduates during their internship. This survey consisted of questions about crucial sets of skills required in the working environment. The scale was from 1 to 4, with 4 being the highest score. The results of the survey were analysed and compared between the three courses taught in Chemistry.

METHODOLOGY

The survey forms were distributed to the 180 respondents (industrial training supervisors) throughout Malaysia. The samples came mostly from the private and government sectors.

The subjects of the survey were students from the Chemistry Programme, the Chemical Technology Programme and the Oleochemistry Programme, all of which are taught in the School of Chemical Sciences and Food Technology, Faculty of Science and Technology of UKM. The survey was conducted in the period from 2013 to 2014.

In 2013, the students who underwent industrial training were from the Chemistry, Chemical Technology and Oleochemistry Programmes. There were 47 students from the Chemistry Programme, 36 from the Chemical Technology Programme and 34 from the Oleochemistry Programme. The total number of students involved was 117.

In 2014, there were no students from the Chemical Technology Programme. Hence, the total number of students who underwent industrial training in 2014 was 63, with 36 coming from the Chemistry Programme

and 27 from the Oleochemistry Programme. The percentage of students involved in the industrial training by programme in 2013 and 2014 is represented in Figure 1 and Figure 2.

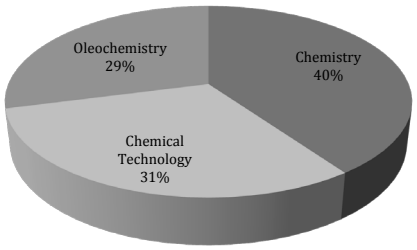

Figure 1. Percentage of students involved in industrial training in 2013

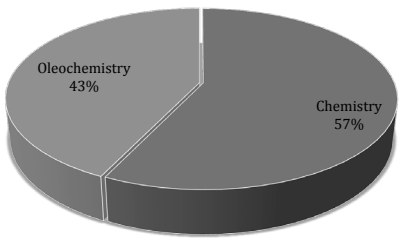

Figure 2. Percentage of students involved in industrial training in 2014

The survey was assessed using a 4-point Likert scale. The questions were on their perception of several aspects; these were intended to assess their mastery of generic and technical skills. Generic or soft skills are complementary to technical skills and include attitude, management and communication skills (Table 1). Under attitude, several aspects were evaluated, namely, punctuality (A1), independence/ self-reliance (A2), interest and responsibility towards the work (A3), attire (A4) and ability to work in a group (A5).

Meanwhile, two aspects were evaluated under management, namely, ability of students to perform assigned tasks accordingly and systematically (M1) and their innovation and ability to solve problems (M2). Under technical skills, the aspects evaluated included knowledge of the activity undertaken (T1) and ability to understand instructions from supervisors (T2). Verbal and writing skills were evaluated under communication skills (C1). These factors were chosen because job opportunities and marketability are influenced by the traits possessed by job seekers (Hussin et al., 2000).

The collected surveys were analysed using the Rasch model and SPSS. Comparisons were made between the students from different programmes and different years. Data were tabulated and represented in a graph for clear viewing statistically. The outcome of this survey was also analysed to establish the ranking of the factors according to potential employers in order to align outcome-based education (OBE) with real-world needs.

RESULTS AND DISCUSSION

Perception of Attitude of Students

The analysis showed that a high percentage of students had scored 'good' and 'very good' for attitude. The first aspect rated by industrial supervisors was punctuality (A1). Punctuality is a very important indicator of an employee's commitment

Table 1
Survey item coded based on required skills

Criteria	Code	Aspects
Attitude	A1	Punctuality
	A2	Independence/Self-reliance
	A3	Interest and responsibility towards the work
	A4	Attire
	A5	Ability to work in a group
Management Skills	M1	Ability to perform task systematically
	M2	Innovation and solving-problem ability
Technical skills	T1	Knowledge of activity
	T2	Ability to understand instructions
Communication skills	C1	Communication skills

to his or her work. As shown in Figure 3, Chemistry students showed the highest score in punctuality compared to students in the other two programmes, with 63.8% of them scoring 'very good' in 2013. The second highest percentage was achieved by Chemical Technology students (58.3%), followed by Oleochemistry students (55.9%). About 20.6% of the Oleochemistry students scored 'bad' for punctuality, making them the biggest group for this negative scoring, followed by Chemical Technology students (11.1%) and Chemistry students (6.4%). None of the Chemical Technology students was rated normal for this aspect and only 4.3% and 2.9% of the students from Chemistry and Oleochemistry programmes, respectively, were rated 'normal'. In 2014, the percentage of students who scored 'very good' for punctuality increased. Oleochemistry students had the highest percentage (81.5%), followed by Chemistry students (97.8%). No Chemistry student was rated 'bad' or 'normal' for punctuality in the year 2014.

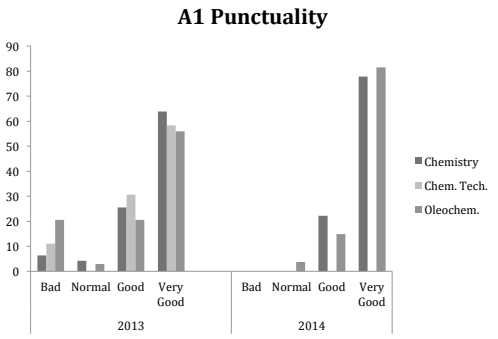

Figure 3. Student's scores on punctuality

For the aspect independence and self-reliance (A2), most of the students were rated 'good' by their supervisors (Figure 4). In 2013, 58.3% of the Chemical Technology students were rated 'good', which was the highest percentage, followed by Chemistry students (46.8%) and Oleochemistry students (41.2%). Although most of the students were rated 'good', Chemistry students recorded the highest percentage of 'very good' in 2013 and 2014. Students who were rated 'very good' in the aspect of independence in 2013 made up 42.6% of

students from the Chemistry Programme, 32.4% from the Oleochemistry Programme and 25% from the Chemical Technology Programme. One student from each programme was rated 'bad' for this aspect. In percentage, this amounted to 2.1% for the Chemistry Programme, 2.8% for the Chemical Technology Programme and 2.9% for the Oleochemistry Programme.

Meanwhile in 2014, 50% of the Chemistry students were rated as 'very good' for the aspect of independence, followed by Oleochemistry students (37%). However, the majority of the Oleochemistry students were rated 'good' (51.9%), followed by Chemistry students (47.2%). No student was rated 'bad' in 2014 while the rest were rated 'normal'.

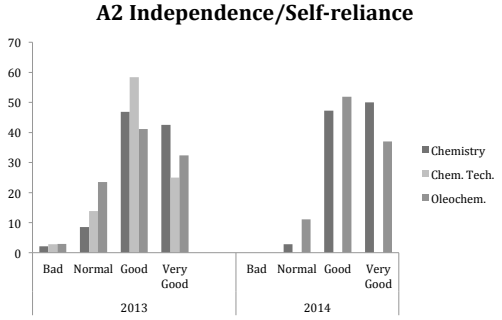

Figure 4. Student's scores on independence and self-reliance

Another aspect evaluated under attitude was the student's interest in and responsibility towards their work (A3). As shown in Figure 5, in 2013, more students from the Chemistry and Oleochemistry Programmes were rated 'very good' under this aspect. A total of 48.9% and 44.1% of students from both programmes, respectively, were rated 'very good', followed by students from the Chemical Technology Programme (38.9%). Most of the Chemical Technology students were rated 'good' (44.4%). Some students were rated 'normal', with the highest percentage made up by the students from the Oleochemistry Programme (29.4%). Only one student from Chemical Technology was rated 'bad' for this aspect, bringing the percentage to 2.8%, the lowest.

In 2014, most of the students were rated 'very good' for the aspects of interest and responsibility. Chemistry students once again scored the highest percentage with 69.4% of them rated 'very good' while 55.6% of Oleochemistry students rated 'very good'. This is a clear increase in the perception of the industrial training supervisors as no student was rated 'normal' or 'bad' as was done the year before.

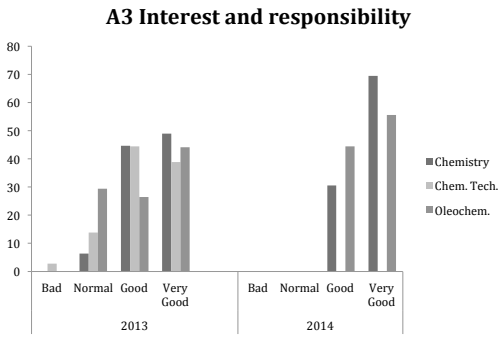

Figure 5. Student's scores on interest and responsibility

Students' attire during their industrial training was also an important aspect included in the survey. Attire (A4) is important as it captures the first impression of an employer of an employee. Figure 6 represents the score of students for this

aspect. In 2013, no student was rated 'bad' for the aspect of attire. Most of the students were rated 'very good', with students from the Chemistry Programme scoring the highest (61.7%), followed by Chemical Technology students (50.0%) and Oleochemistry students (44.1%). A total of 33.3% of students from the Chemical Technology Programme were rated 'good' for this aspect, followed by 31.9% of students from the Chemistry Programme and 29.4% from the Oleochemistry Programme. Some students were rated 'normal' in this aspect. However, the percentage was below 30%. In 2014, an improvement was seen as no student was rated 'bad' or 'normal' in the aspect of attire. More than 60% of the students were rated 'very good' in this aspect, with 69.4% of the students from the Chemistry Programme and 70.4% students from Oleochemistry Programme. The rest were rated 'good'.

The last aspect evaluated under attitude was the ability of students to work in a group (A5). Working in a group is very important in the working environment. Students must be able to work with others and hold group discussion to look for solutions to problems. Thus, being able to work in a group is a crucial aspect of student marketability. In 2013, no student was rated 'bad' in their ability to work in a group (Figure 7). Most of the students were rated 'very good' by their industrial supervisors, with the highest percentage obtained by the students from the Chemistry Programme (53.2%), followed by Chemical Technology students (47.2%) and Oleochemistry students (44.1%). The rest of the students were rated 'good' and 'normal' with students from the Oleochemistry Programme having the highest percentage of 'normal' (32.4%), while only 11.1% and 8.5% of the students from Chemical Technology and Chemistry Programmes, respectively, were rated 'normal'.

In 2014, only one person from the Chemistry Programme was rated 'normal' for this aspect (2.8%). The rest of the students were rated 'good' and 'very good', with the majority receiving the latter. A total of 61.1% of Chemistry students were rated 'very good', which was the highest, followed by Oleochemistry students with 59.3% while 40.7% of Oleochemistry

Figure 6. Student's scores on their attire to work

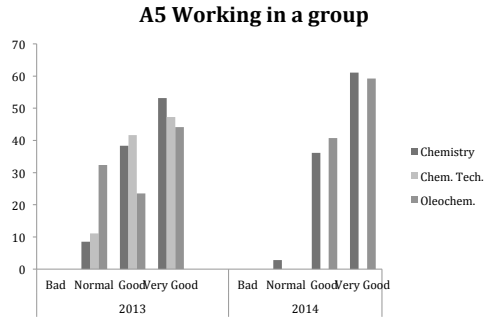

Figure 7. Student's scores on their ability to work in a group

students and 36.1% of Chemistry students were rated 'good'. These trends showed that the perception of industrial supervisors had increased from 2013 to 2014.

From the employer's point of view, almost all aspects under attitude were greater than 3 on the scale, and this implied overall satisfaction with the students' performance. Chemistry students received the highest rate for punctuality, followed by attire, interest and responsibility, working in a group and independence. Most employers are satisfied and content with students/ potential employees who display good attitude at the workplace (Muda et al., 2012).

Perception of Management Skills of Students

Under management, the first aspect evaluated was the ability of students to perform the assigned tasks accordingly and systematically (M1). This is an important aspect in the working environment as an employee must be able to perform any tasks assigned to him or her in the best way possible to achieve the desired outcome. From the graph shown in Figure 8, the highest percentage of students rated 'very good' for this aspect were the students from Chemical Technology (44.4%), followed by Chemistry students (36.2%) and Oleochemistry students (32.4%). Most of the Chemistry and Oleochemistry students were rated 'good' (53.2% and 35.3%, respectively). Some students were rated 'normal'; the biggest group was the Oleochemistry students (32.4%), followed by the Chemical Technology students (22.2%) and Chemistry students (10.6%). One student from the Chemical Technology Programme was rated 'bad' for this aspect (2.8%). A good attitude leads workers to do their very best in completing assigned tasks.

In 2014, the majority of the Chemistry students were rated 'very good' (60%), while 40.7% of Chemical Technology students were rated 'very good' and the rest of them (59.3%) were rated 'good'. One student from the Chemistry Programme was, however, rated 'normal'; thus, the percentage rated as 'good' was 33.3%.

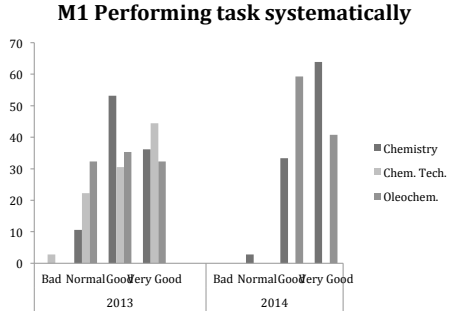

Figure 8. Student's scores on their ability to perform assigned tasks systematically

Another aspect included under management that was evaluated by the industrial supervisors was the student's innovation and ability to solve problems (M2). Innovation is the ability of a person to translate an invention or idea into something valuable. In the industrial world, it is crucial for a person to be innovative and to be able to solve problems by thinking outside the box (Singh et al., 2014). As shown in Figure 9, in 2013, most of the students from the Chemistry and Chemical Technology Programmes were rated 'good' instead

of 'very good'. A total of 74.5% of the Chemistry students and 44.4% of Chemical Technology students were rated 'good'. The majority of the Oleochemistry students scored 'normal' (44.1%). Students rated 'very good' in this aspect numbered less than 20% for all programmes; they were led by Chemical Technology students (19.4%), followed by Oleochemistry (17.6%) and Chemistry (14.9%) students. One student from Chemical Technology was rated 'bad' for innovation and problem solving (2.8%). The data suggested that the employers thought the student could complete a given task but this was not the case.

In the year of 2014, the trend was about the same as in 2013. The majority of the students from the Chemistry and Oleochemistry Programmes were rated 'good' instead of 'very good' for innovation and problem solving (66.7% and 40.7%, respectively). Oleochemistry students rated 'normal' in this aspect at a percentage (33.3%) much higher than for Chemistry students (5.6%). However, compared to the year 2013, a slight increase was observed in the percentage of students rated 'very good'.

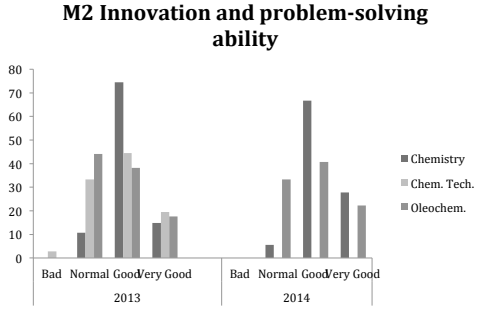

Figure 9. Student's scores on their innovation and problem-solving ability

As shown in the graph, 27.8% of Chemistry students were rated 'very good' followed by 22.2% of Oleochemistry students.

Perception of Technical Skills of Students

Technical skills comprise the knowledge and capability of a person to perform specialised tasks related to a specific field. From the point of view of this study, technical skill is the measure of a student's capability to complete tasks related to Chemistry and how the student communicates to understand the tasks given. The first aspect evaluated under this aspect was knowledge of students regarding the activity undertaken during their internship (T1). It is important for an employee to understand what he/she is doing while working. This is because when an employee does not understand his/her work based on the standard operating procedure (SOP), he/she will be apt to make mistakes.

According to Figure 10, in 2013, the majority of the students from all programmes were rated 'good'. The highest number of 'good' students were from the Chemistry programme (63.8%), followed by Oleochemistry (55.9%) and Chemical Technology (52.8%). No student was rated 'bad' for this aspect. Students rated 'normal' came from the Oleochemistry programme as being the group with the highest number of 'normal' (26.5%), followed by Chemical Technology and Chemistry (22.2% and 14.9%, respectively). The rest were rated 'very good' (25.0% from Chemical Technology, 21.3% from Chemistry and 17.6% from Oleochemistry).

Compared with 2014, the percentage of students rated 'very good' had increased compared to 2013 (30.6% from Chemistry and 29.6% from Oleochemistry). However, the majority of the students were still rated 'good'. The percentage of students rated 'good' was led by the students from the Chemistry Programme (63.9%), followed by those from the Oleochemistry Programme (59.3%). A small percentage of students were rated 'normal', with more students from the Oleochemistry Programme at 11.1% compared with those from the Chemistry Programme at 5.6%.

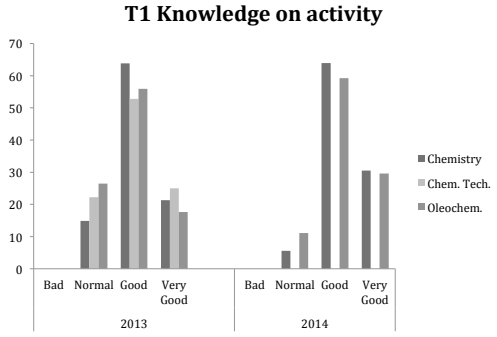

Figure 10. Student's scores on their knowledge of the activity undertaken

The ability of students to understand instructions from the supervisor (T2) is considered important as employees must be able to understand orders given in order to complete work on time and with the expected results. The evaluation of supervisors for this aspect is represented in Figure 11. From the figure, most of the students from all the programmes were rated 'very good' for both years. In 2013, students rated 'very good' were mostly from the Chemistry Programme (57.4%), followed by the Oleochemistry Programme (52.9%) and the Chemical Technology Programme (52.8%). Chemistry students received the highest number of 'good' rating (31.9%), followed By Chemical Technology students (27.8%) and Oleochemistry students (23.5%). Four students were rated 'bad' for the aspect of understanding instructions from supervisors. Two of them were from the Chemical Technology Programme (5.6%), while the other two were from Chemistry (2.1%) and Oleochemistry (2.9%). The rest of the students were rated 'normal'.

As mentioned earlier, similar to the year 2013, the majority of the students in 2014 were rated 'very good' with the highest number of the rating collected by Chemistry students (69.4%), followed by Oleochemistry students (59.3%). Some of the students were rated 'normal'. Of them, 29.6% were Oleochemistry students, while 27.8% were chemistry students. No student was rated 'bad' in 2014, while the rest were rated 'normal'. Looking at the trend, the percentage of students rated 'very good' had increased by the year.

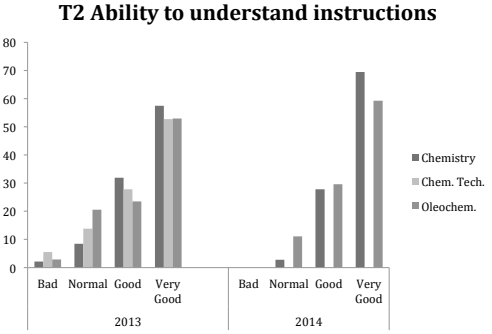

Figure 11. Student's scores on their ability to understand instructions from the supervisor

The data suggested that the potential students were marketable based on their technical skills. Several studies, however, indicated that Science students did not lack in technical competency but lacked rather in soft skills that would enable them to use their technical skills most effectively (Idrus et al., 2014). This emphasises the fact that higher learning institutions must produce graduates who are prepared for the working world.

Perception of Communication Skills of Students

The last aspect evaluated was communication skills (C1). Communication skills are soft skills that include verbal and writing skills. Being able to communicate with others in the working environment and elsewhere is vital for any employee. Employers are likely to evaluate communication skills during job interviews as they are considered primary workplace skills. Thus, if students possessed good communication skills, it is possible that their marketability would increase and it would be easier for them to get hired.

Figure 12 illustrates the rating for the students' communication skills by the industrial supervisors. For 2013, the majority of students were rated 'good' and 'very good'. The majority of Chemistry and Chemical Technology students were rated 'good' at 48.9% and 44.4%, respectively. A percentage of 35.3% of Oleochemistry students were rated 'good', while the majority of them (38.2%) were rated 'very good'. Although the majority of the Chemistry students did not achieve 'very good', they still gained the highest percentage at 40.4%, followed by Chemical Technology students at 36.1%. Fourteen students were rated 'bad' in communication skills, with half of them being from the Oleochemistry Programme (20.6%), followed by the Chemical Technology Programme, with four students being rated 'bad' (11.1%) and three students from the Chemistry Programme being rated 'bad' (6.4%). The rest were rated 'normal' for communication skills.

In 2014, an improvement was seen as no student was rated 'bad' in communication skills. The Chemistry Programme showed the best improvement as it had no student who had been rated 'normal'. The majority of the students were rated 'very good' for both the Chemistry and Oleochemistry Programmes at 55.6% and 48.1%, respectively. Both programmes gained the same percentage of 44.4% for 'good', while two students from the Oleochemistry Programme were rated 'normal' (7.4%).

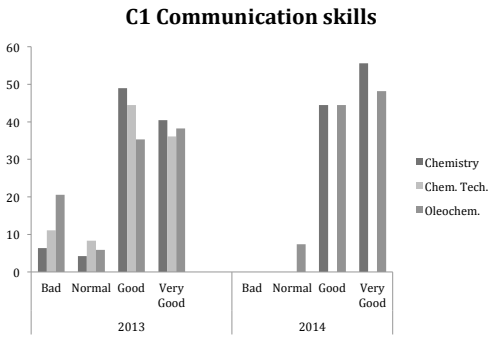

Figure 12. Student's scores on their communication skills

Table 2
Independent t-test between criteria studied in industrial training in 2013 and 2014

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means					95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed	Mean Difference	Std. Error Difference	Lower	Upper
SMean (A1)	Equal variances assumed	32.176	.000	-3.387	183	.001	-44790	-.13225	-.70884	-.18697
	Equal variances not assumed			-4.145	177.895	.000	-.44790	-.10806	-.66114.	-.23467
SMean (A2)	Equal variances assumed	14.361	.000	-2.258	183	.025	-.24904	-.11039	-.48885	-.03123
	Equal variances not assumed			-2.432	161.191	.016	-.24904	-.10241	-.45128	-.14680
SMean (A3)	Equal variances assumed	14.361	.000	-3.472	183	.001	-.36580	-.10537	-.57369	-.15791
	Equal variances not assumed			-3/966	179.538	.000	-.36580	-.09223	-.54780	-.18381
SMean (A4)	Equal variances assumed	30.782	.000	-3.171	183	.002	-.32110	-.10125	-.52088	-.12133
	Equal variances not assumed			-3.632	180.037	.000	-.32110	-.08840	-.49555	-.14666
SMean (A5)	Equal variances assumed	14.287	.000	-2.521	183	.013	-.26181	-.10384	-.46670	-.05692
	Equal variances not assumed			-2.794	171.271	.006	-.26181	-.09369	-.44676	-.07686
SMean (M1)	Equal variances assumed	4.894	.028	-3.477	183	.001	-.37219	-.1-7-5	-.58340	-.16097
	Equal variances not assumed			-3.874	172.986	.000	-.37219	-.09607	-.56182	-.18256
SMean (M1)	Equal variances assumed	.681	.410	-1.950	183	.053	-.20069	-.10294	-.40378	-.00240
	Equal variances not assumed			-1.981	137.530	.050	-.20069	-.10131	-.40101	-.00037
SMean (T1)	Equal variances assumed	.151	.698	-2.164	183	.032	-.20890	-.09655	-.39939	-.01841
	Equal variances not assumed			-2.252	147.220	.026	-.20890	-.09275	-.39218	-.02562
SMean (T2)	Equal variances assumed	10.567	.001	-2.109	183	.036	-.25360	-.12024	-.49084	-.01636
	Equal variances not assumed			-2.336	171.051	.021	-.25360	-.10856	-.46789	-.03931
SMean (T3)	Equal variances assumed	4.417	.037	-3.181	183	.002	-.41506	-.13049	-.67252	-.15761
	Equal variances not assumed			-3.699	182.271	.000	-.41506	-.11220	-.63645	-.19368

Difference between Industrial Training in 2013 and 2014 (Independent T-Test)

An independent t-test was employed when the samples were collected independently of one another to compare two small sets of quantitative data. Using 0.05 as the α-value, the null hypothesis, H_0, is more likely to be rejected when the p-value is less than 0.05 ($p<0.05$) and the alternative hypothesis, H_α, is accepted. On the contrary, the null hypothesis is accepted if the p-value is greater than 0.05 ($p>0.05$).

To identify the differences between the industrial training data in 2013 and 2014, an independent t-test analysis was used. The most likely hypotheses inferred in this research were:

H_0= There is no difference between the industrial training in 2013 and the industrial training in 2014.

H_α= There is a difference between industrial training in 2013 and the industrial training in 2014.

Based on Table 2, the value of equal variances assumed was considered in this research. The p value is shown in the significance (two-tailed) column. For all criteria except for M2, the p values were less than 0.05 ($p<0.05$). Thus, the null hypothesis, H_0, was rejected for all ten aspects. It can be concluded that there was a significant difference between the industrial training in 2013 and the industrial training in 2014. However, for section M2, as the p value was 0.053, which was higher than 0.05, the null hypothesis, H_0, was accepted. Thus, there was no significant difference between the industrial training in 2013 and the industrial training in 2014.

CONCLUSION

A survey was conducted to investigate the marketability of Chemistry students from the School of Chemical Sciences and Food Technology, Faculty of Science & Technology, Universiti Kebangsaan Malaysia based on their performance during industrial training. The Chemistry Programmes surveyed were the Chemical Sciences, Chemical Technology and Oleochemistry. A 4-point Likert scale was used and the results were evaluated using the Statistical Package for the Social Sciences (SPSS) and Rasch analyses. The results of the three programmes were also compared. Overall, the Chemistry students were found to be marketable as they obtained mostly 'good' (Likert scale level 3) and 'very good' (Likert scale level 4) scores for attitude, management, technical skills and communication skills. The performance of the students from all three programmes was almost the same within the two-year investigation period. However, there were aspects that they needed to improve; these were innovation and problem-solving ability. Thus, the syllabus should be improvised 1) to introduce more generic skill subjects, 2) to apply problem-based and query-based learning that focusses on student-centred learning and 3) to boost the students' skills

through the introduction of extra-curricular activities that require engagement with the community and the industry.

REFERENCES

Ahmad, S., Khaidzir, I., Azizan, A., Kadir, A., Zainul Ariffin, A. A., Anwar, K., & Wan Mazlina, W. M. (2014). The social and academic skills and the marketability of UKM's graduates. *Procedia – Social and Behavioral Sciences 131*, 118–123.

Hanapi, Z., & Nordin, M.S. (2014). Unemployment among Malaysia graduates: Graduates' attributes, lecturers' competency and quality of education. *Procedia – Social and Behavioral Sciences, 112*, 1056–1063.

Hussin, S. R., Soon, T. H., & Sidin, S. M. (2000). Marketing analysis of the higher education service sector in Malaysia: Consumer perspective. *Pertanika J. Soc. Sci and Hum., 8*(1), 1–6.

Idrus, H., Daham, H. M., & Abdullah, N. (2014). Integrating soft skills in the teaching of hard sciences at a private university: A preliminary study, *Pertanika J. Soc. Sci and Hum., 22*(S), 17–32.

Krish, P., Tamby Subahan, M. M., Osman, K., & Ikhsan, Z. (2012). *Procedia – Social and Behavioral Sciences, 59*, 584–590.

Lau, Y. W., & Lim, S. Y. (2015). Accounting undergraduates' learning approaches: Case of a Malaysian public university. *Pertanika J. Soc. Sci and Hum., 25*(S), 143–154.

Muda, M., Din, U. K. S., Majid, N., Ahmad, R. R., Shahabudin, F. A. A., Rambely, A. S., & Suradi, N. R. M. (2012). Industrial training as a benchmark of the employability for the mathematical sciences students of UKM, *Procedia – Social and Behavioral Sciences, 131*(59), 598–603.

Pianin, E. (2014). The surprising reason college grads can't get a job. *The fiscal times* (January). Retrieved 2016, October 25 from http://www.thefiscaltimes.com.

Samuel, R., & Ramayah, T. (2016). Employability, mobility and work-life balance: How do they relate for MBA holders in Malaysia? Pertanika *J.Soc. Sci. and Hum., 24*(1), 359–374

Singh, P., Thambusamy, R. X., & Ramly, A. (2014), Assessing graduates' generic skills: An indicator of employability. *Pertanika J. Soc. Sci. and Hum., 22*(3), 845–860.