

## Students' Perception of the Programme Offered by the School of Biosciences and Biotechnology, Faculty of Science and Technology, UKM (Persepsi Pelajar terhadap Program yang Disajikan oleh Pusat Pengajian Biosains dan Bioteknologi, Fakulti Sains dan Teknologi, UKM)

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### ABSTRACT

*This study was conducted to gauge students' competency and satisfaction in employment preparation within programmes offered by the School of Biosciences and Biotechnology, at the Faculty of Science and Technology, Universiti Kebangsaan Malaysia (UKM). A survey questionnaire was distributed to all final year students of the School and 128 of them responded. The results showed that for the programme components, respondents were most satisfied with the quality of academic staff, followed by the quality of fellow students, curricular contents and overall learning environment. In terms of knowledge, general skills, and virtues they received, the respondents expressed high competency levels in various areas which include the languages, English and Bahasa Melayu, interpersonal skills, information technology and research skills, and work related skills gained through industrial training attachment. However, respondents rated the overall academic experience to be of average standing. These findings indicated that the curricular contents need to be reviewed to improve/enhance the quality of the programmes offered in order to prepare students for demanding expectations of the job market.*

*Keywords: Higher education; student satisfaction; curriculum evaluation; employability; skills*

### ABSTRAK

*Kajian ini dijalankan untuk mengetahui keupayaan dan kepuasan pelajar dalam penyediaan untuk alam pekerjaan yang dilakukan dalam program yang ditawarkan oleh Pusat Pengajian Biosains dan Bioteknologi, Fakulti Sains dan Teknologi, Universiti Kebangsaan Malaysia (UKM). Borang soal selidik dihantar kepada semua pelajar tahun akhir Pusat Pengajian dan 128 daripada mereka telah memberi jawapan. Hasil kajian menunjukkan untuk komponen program, responden sangat berpuas hati dengan kualiti tenaga akademik, diikuti dengan kualiti rakan pelajar, kandungan kurikulum dan keseluruhan persekitaran pembelajaran. Dari segi ilmu pengetahuan, kemahiran umum, dan amalan kebaikan yang mereka terima. Responden menyatakan aras keupayaan yang tinggi dalam pelbagai bidang termasuk bahasa, Inggeris dan Bahasa Melayu, kemahiran interpersonal, teknologi maklumat dan kemahiran penyelidikan, dan kemahiran bekerja yang didapati melalui sangkutan latihan industri. Walau bagaimanapun, responden menilai keseluruhan pengalaman akademik adalah sederhana. Hasil kajian ini menunjukkan kandungan kurikulum perlu dinilai semula untuk memperbaiki/menambah baik kualiti program yang ditawarkan dalam menyediakan pelajar untuk memenuhi permintaan pasaran kerja.*

*Kata kunci: Pendidikan tinggi; kepuasan pelajar; penilaian kurikulum; pekerjaan; kemahiran*

### INTRODUCTION

Rapid globalisation and advancements in information technology have reshaped the employment trend, making demands on the kind of graduates that come out of universities. Such demands which emphasise on the standards and quality of graduates have thus created an environment which is gravitating towards the high achievers. According to the Malaysian Ministry of Higher Education, a quarter of all graduates in 2012 had not secured employment at graduation and World Bank found that nearly one in five degree holders under the age of 25 were unemployed in 2012 (New Straits Times 2015). In collaboration with Talent Corp., the World Bank conducted a graduate employability survey in 2014 in Malaysia, the

perceived quality of Malaysian graduates by top employers, as well as the efficacy of career services in universities and Government-funded graduate employability programmes. The survey found out, one possible explanation for the relatively high rate of graduate unemployment could be employers' unwillingness to offer the level of compensation needed to meet the expectations of recent graduates and attract the required talent.

According to other survey respondents in 2011, a main driver of graduate unemployment is skills mismatches between recent graduates and employers' demands. One survey said 81% of all respondents identified communication skills as the major deficit, followed by creative/critical thinking, analytical and problem-solving competencies. A survey done by Jobstreet in November

2011 said they were unable to hire the graduates due to the job seekers' poor communication skills, notably their lack of command in using English which remains the business lingua franca worldwide (Md Izwan & Zurairi 2012).

According to the Federation of Malaysian Manufacturers (FMM), the lack of industrial training is also among the factors why graduates are unemployed. Meanwhile, the Higher Education Ministry Student Development and Affairs Director reported other factors that compounded the issue are low problem-solving skills, tendency to switch jobs or job-hopping and lack of self-confidence (Zulkiple 2014).

Realising these problems, the government are focussing on strengthening public and private higher learning institutions towards producing quality graduates who meet the demands of the job market. The government in 2014 budget has allocated RM330 million fund under the Skills Development initiative to improve training quality to produce highly skilled workforce under the Ministry of Human Resource. Loans are provided for school leavers to enrol in skills training courses (Raj 2014).

In an effort to tackle the lack of competencies in generic skills among local graduates, Malaysian institutes of higher learning had to integrate various soft skills training into the curriculum to better prepare students for the workplace. The skills that were incorporated into university curriculum included skills in communication, entrepreneurship, information technology, leadership, and teamwork. Critical and thinking skills were given focus too as the development and enhancement of these skills were considered essential and pivotal to any training. The ability to critically analyse situations would be achieved through the implementation of problem-based strategies to facilitate learning in various university courses.

Other educational institutions worldwide, including the United Kingdom, Canada, USA, Australia, New Zealand, Germany and Singapore are currently engaging greater emphasis on enhancing graduate employability by strengthening their soft skills and adopting a more employability-oriented approach to the curriculum (Yim-Teo 2004).

With their concern to provide programmes relevant to the demands of the job market, researchers at UKM's School of Biosciences and Biotechnology conducted a survey to evaluate the effectiveness of their programmes in preparing students for the workplace. This paper focused specifically on students' evaluations of the programmes and their readiness for the workplace environment. The aim of this study was to assess the components of the programmes to ensure that students were provided with opportunities to develop and enhance the necessary skills needed by employers. The specific objectives of this study were to:

1. Identify the satisfaction level among graduates towards the programmes attended at the school,
2. Assess the preparedness of would-be graduates to undertake employment, and

3. Evaluate the effectiveness of the teaching and learning process of programmes offered.

Results obtained from this survey will be taken into consideration and used as a guide by the School to improve the overall curriculum including contents, teaching methods, presentation and research skills and other areas that need to be strengthened.

#### METHODOLOGY

A survey questionnaire was distributed to final year students at the School of Biosciences and Biotechnology, UKM. The students were due to complete their studies in 2011. From the questionnaires distributed, 128 responses were obtained. The questionnaire was designed based on the current needs of stakeholder on our graduates skills and curriculum contents. It was divided into four sections: A) students' background, (B) programme rating on quality of academic staff, fellow students, curriculum contents, and the overall learning environment, (C) students' preparedness in knowledge, skills, and values, and (D) the overall interpretation of the School of Biosciences and Biotechnology.

The four sections contained 124 close-ended questions that respondents were asked to complete and these items were arranged to form a Likert-type scale with a 5 point spread for Sections B, C and D. The rating scales for the three sections were as follows: section B, from 1 (very dissatisfied) to 5 (very satisfied), Section C, from 1 (poorly prepared) to 5 (very prepared); Section D, from 1 (very dissatisfied) to 5 (very satisfied). The data collected were analysed using the SPSS software version 18.0 to obtain a precise assessment and expressed as average mean values. Statistical analysis of the accumulated data can be utilised by the School to improve or revise the related teaching and learning system in use.

Below is a summary of the different types of questions contained in the questionnaire:

**Section A:** General questions pertaining to students' background such as year of graduation, degree to be obtained, age and ethnicity.

**Section B:** Rating of the programme components by the students based on the quality of academic staff, quality of fellow students, content of the curriculum and their learning environment. The rating scale was from the highest 5 (very satisfied) to the lowest 1 (very dissatisfied).

**Section C:** Questions on student perception towards programme's effectiveness in preparing them in knowledge, skills, and values. The students were asked to assess the programme attended based on general skills, quantitative skills, interpersonal skills, information technology skills, research skills, contribution towards organisation and preparedness in industrial training. The rating was given on a scale from the highest 5 (very prepared) to the lowest 1 (poorly prepared).

Section D: Students' opinion on the overall evaluation of the School of Biosciences and Biotechnology based on their opinion of the strengths and weaknesses of the programmes attended, the extent to which the programme fulfilled their expectations, the cost (time, effort, money, and lost income) compared to the benefit of education

(change in salary, job, promotion), the likelihood that they would recommend the programme or the School to family and friends and whether UKM graduates had market value. The rating was given on a scale from the highest 5 to the lowest 1 as described in Table 1.

TABLE 1. Likert Scale: Question and rating for section D

Question	Rating				
	5	4	3	2	1
D3	Far Above Expectations	Moderately Above Expectations	Met My Expectations	Moderately Below Expectations	Far Below My Expectations
D4	Excellent	Good	Average	Poor	Very Poor
D5	Very satisfied	Satisfied	Average	Dissatisfied	Very Dissatisfied
D6	Very Likely	Likely	Average	unlikely	Very Unlikely

RESULTS AND DISCUSSION

SECTION A: RESPONDENTS' BACKGROUND

A total of 128 respondents due to graduate in 2011 completed and returned the survey forms that were distributed to final year students. The majority of the respondents were females (110 respondents or 85.9%) and 18 males (14.1%). The respondents' age ranged from 21

to 29 years. In terms of age group, the highest percentage of respondents, 58%/ 74 respondents, was 22 years of age; 34%/ 44 respondents were 23 5%/, 7 were 21 while 1.0%/1 was between 25 to 29 years of age. In terms of ethnicity, the majority of respondents were Malays (84 respondents or 65.6%), followed by Chinese (32 respondents or 5%) and Indians (5 respondents or 3.9%) and of other ethnicity (7 respondents or 5.5%) (Figure 1).

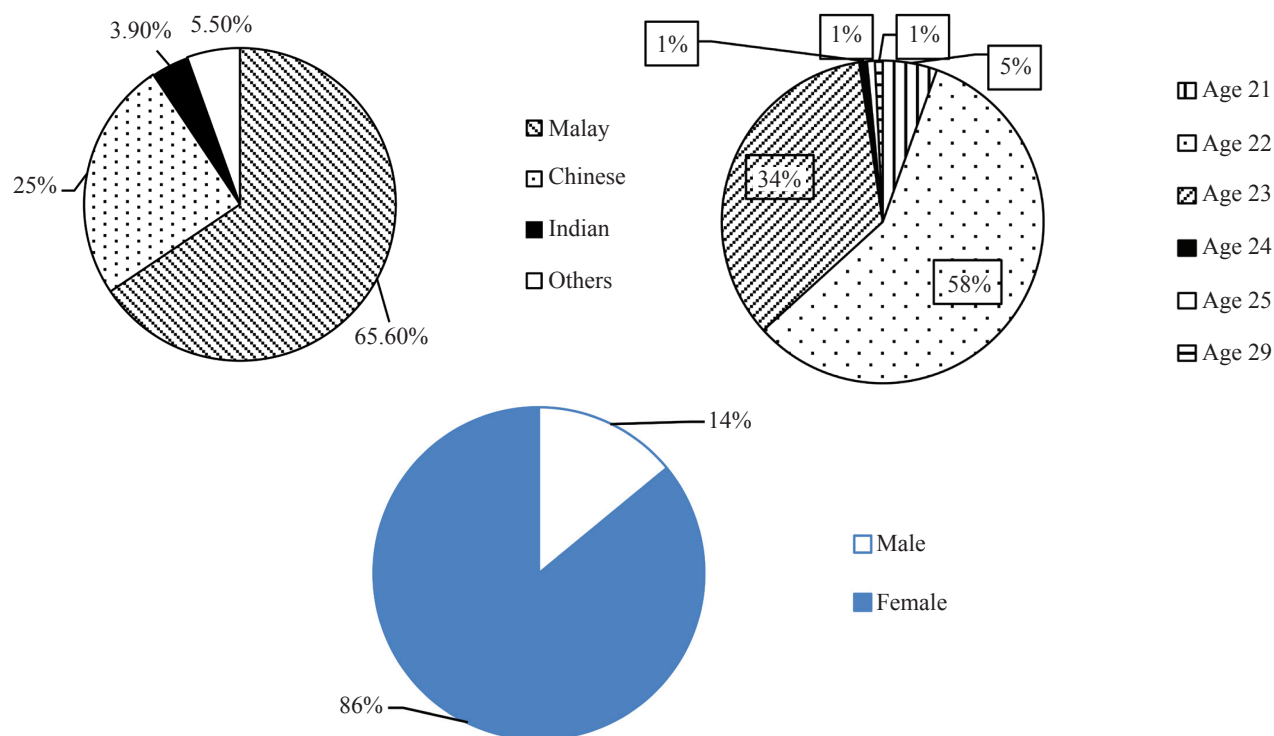


FIGURE 1. Percentages of respondents based on (a) ethnicity, (b) age and (c) sex

Table 2 shows the feedback obtained from a random distribution of the survey forms to students from the seven

programmes offered by the School of Biosciences and Biotechnology. Majority of the respondents were from the

Microbiology and Biochemistry Programme, each with 34 respondents (26.6%), followed by 21 respondents from Plant Biotechnology (16.4%) and 10 each (7.8%) from Bioinformatics and Genetics. The number of respondents was the lowest at 5 persons (3.9%) from the Biotechnology with Management Programme.

TABLE 2. Percentages of respondents according to programmes

Programme	Number of respondents	Percentage
Biochemistry	34	26.6
Biotechnology and Management	5	3.9
Bioinformatics	10	7.8
Genetics	10	7.8
Microbiology	34	26.6
Plant Biotechnology	21	16.4
Zoology	14	10.9
Total	128	100

#### SECTION B: EVALUATION OF PROGRAMME COMPONENTS

The items focusing on the quality of academic staff obtained the highest average mean value ( $4.04 \pm 0.78$ ) which indicated that students were satisfied with the quality of academics as based on their evaluation of the teaching components. Three other factors: quality of fellow students, curricular contents and overall learning environment were rated as average with mean values of 3.88, 3.80, and 3.80, respectively (Table 3). The overall average mean value for this section was 3.88.

The result showed that despite having a commendable staff, the School needed to take a relook and re-evaluate the contents of the curriculum in use and the overall learning environment. The state of affairs had highlighted the need to foster a more enabling environment for new learning and teaching experiences to take place that could help improve the overall performance of the students for the job market situations. This would indirectly reflect the quality of education offered by the School which is in line with the stakeholders' needs and demands. Based on these findings, the curricular contents were revised in year 2012 and had been implemented in year 2014/15 sessions.

TABLE 3. Average mean value for programme components

Component	Mean $\pm$ SD
Quality of academic staff	$4.04 \pm 0.78$
Quality of fellow students	$3.88 \pm 0.65$
Curriculum contents	$3.80 \pm 0.64$
Overall learning environment	$3.80 \pm 0.73$

#### SECTION C: PREPAREDNESS OF THE SCHOOL OF BIOSCIENCES AND BIOTECHNOLOGY, UKM IN ASPECTS OF GENERAL KNOWLEDGE, BASIC SKILLS, AND MORAL VALUES

Respondents were requested to evaluate the programmes based on the ones that would equip them with general knowledge, basic skills, and moral values. In the survey, respondents rated their programme based on general skills, specialized skills, and generic skills as a whole. The assessment was based on a Likert scale ranging from 1 (poorly prepared) to 5 (very prepared).

For language proficiency, the survey sought to find out what they perceived their levels in Bahasa Melayu and English were. The respondents were asked to rate their language proficiency, and the result showed that they rated their Bahasa Melayu proficiency as good (Oral = 4.26, Written = 4.36) and average for English (Oral = 3.74, Written = 3.94) as shown in Table 4. The lower self-evaluation for English may stem from the lack of opportunities to use and master it and from their poor command of the language. This may result in a lack of confidence and a feeling of discomfort in their ability to use the language effectively. Further evaluations are required in order to implement a suitable intervention programme.

The same survey which has been conducted by JobStreet.com in November 2011, 571 human resource personnel from Klang Valley and outside Klang Valley as employers, their opinion on the top reasons why fresh Malaysian graduate were not hired are; 56% due to poor command of English language and 52% of poor communication skills (Si 2011). Study conducted by Masturah et al. (2013) of unemployed graduates who took part in the 1 Malaysia Training Scheme, also indicated 67.1% out of 337 respondents were in the range of moderate to low level in their general English communication skills. The respondents indicated their inability to communicate ideas as the main factor that affect, their communication skills. Research showed that the lack of communication skills has led to graduates being less marketable in the realm of local employment (Mohd 2009). At this point, however, the best way to address this would be to increase the opportunities to use and improve their proficiency in written and spoken English starting from secondary level.

TABLE 4. The average mean values of general skills in terms of language proficiency

Component	Mean $\pm$ SD
Oral communication: English	$3.74 \pm 0.70$
Oral communication: Bahasa Melayu	$4.26 \pm 0.74$
Written communication: English	$3.94 \pm 0.72$
Written communication: Bahasa Melayu	$4.36 \pm 0.70$

For their general skills, the students scored an average mean value of 4.14, showing that the students rated themselves well in time management, work ethics, social responsibility, adaptability, able to listening skills, work commitment, self-appearance, and self-confidence (Table 5). However, the respondents answered average for presentation skills (3.96) and leadership qualities (3.92). It is interesting to notice that though the students rated themselves well on self-confidence, they rated themselves as average on presentation skills and leadership qualities which require some degree of self-confidence. We, however, acknowledge that opportunities for students to develop their presentation skills are not readily available other than in courses such as scientific communications and during the presentation of their research project proposal. The other possible avenue for articulating their ideas and thoughts would be the tutorials. Therefore, we believe that though these individuals may be comfortable with self, they have not reached the comfort zone in public speaking. This situation had existed even before their time in IHLs and we can assume that the school system did not provide adequate opportunity for students to hone their skills in this area.

Winterbotham et al. (2001), stated overall employers are less demanding of academic excellence and technical skills, and consider them trainable if candidates are able to demonstrate positive attributes and soft skills. For many employers, the weaknesses of graduates in soft skills are observable prior to screening process, interview or selection sessions that are based on candidate physical appearances, aptitudes ability, communication, and other personal talents. This includes dress code, appearances, conversation, confidence, motivation, flexibility, positive gesture, mannerisms, and resourcefulness (Devins & Hogarth 2005).

TABLE 5: The average mean values of general skill components

General Skills	Mean
Presentation skills	3.96 ± 0.66
Time management & punctuality	4.13 ± 0.64
Adaptability	4.23 ± 0.58
Work ethics	4.16 ± 0.70
Social responsibility	4.15 ± 0.74
Ability to listen	4.31 ± 0.61
Commitment to work	4.36 ± 0.62
Leadership qualities	3.92 ± 0.78
Self-confidence	4.08 ± 0.71
Self-appearance	4.06 ± 0.72

The students were asked to rate their quantitative skills, namely, data collection and analysis, statistical analysis, problem solving skills, and critical thinking. The average mean value obtained was 3.77 (Table 6). The opportunity for data collection was ample as the students collected data during their laboratory practical and for their research

project. However, the extent to which these opportunities were made available to them to develop analytical skills might have been limited as this was dependent on the choice of subject selected by the student.

TABLE 6: The average mean values of quantitative skills

Quantitative Skills	Mean
Data collection and analysis	3.86 ± 0.67
Statistical analysis	3.61 ± 0.68
Problem solving skills	3.87 ± 0.63
Critical thinking	3.73 ± 0.66

Interpersonal skills scored an average mean value of 4.32 (Table 7). This showed that the students had the opportunity to work in teams during lectures, laboratory or field work without significant conflict despite differences in background and personal opinions.

TABLE 7: The average mean value of interpersonal and information technology skills

Skills	Mean ± SE
Interpersonal	
Teamwork	4.37 ± 0.60
Respect of other opinions and views	4.44 ± 0.60
Racial tolerance	4.36 ± 0.64
Conflict resolution	4.09 ± 0.61
Information Technology	
Database analysis	3.68 ± 0.66
Internet search	4.49 ± 0.59
Computer proficiency	4.21 ± 0.62

When asked on information technology skills and research skills, the respondents scored an overall mean of 4.13 and 4.00, respectively (Table 7). This showed that the current curricular content in use was adequate to provide the students with the necessary scientific skills. However, based on the mean score of 3.68 the survey revealed that the students regarded their ability for database analysis to be mediocre. This was probably due to the insufficient focus in curricular content to train the students in experimental design, and through personal communication, the students felt that the course did not equip them adequately to enable them to plan experimental design and to conduct statistical analysis thereafter. Therefore, it is advisable to take a relook at the predominant mode of teaching used or to include aspects of experimental design and statistical analysis into courses where applicable.

In the survey, the average mean value of 3.64 in the contributions toward organizations theme indicated that respondents failed to see how they might contribute to their current organizations in terms of creativity and research execution, marketing skills, and global orientation (Table

8). It signified that the curriculum in use then was not able to provide students with non-scientific knowledge related to biotechnology and with an avenue to explore possibilities of planning and executing activities that would enable them to contribute to the organization or the community in general. We would need to include a component in the curriculum that could develop a sense of social responsibility in order to raise a generation that is not only sensitive to their social obligations but also one that is able to translate knowledge into wealth and thereafter into humanity.

TABLE 8. The average mean value of research skills and contribution towards organisation

Ability	Mean $\pm$ SE
Research Skills	
Competence in research methods	3.99 $\pm$ 0.65
Competency in handling lab equipment	4.07 $\pm$ 0.72
Ability to plan and conduct research	3.95 $\pm$ 0.69
Contribution towards organisation	
Creativity and executing research	3.8 $\pm$ 0.68
Marketing skills	3.49 $\pm$ 0.79
Global orientation	3.64 $\pm$ 0.70

From the survey, a large number of respondents agreed that they were prepared to go through Industrial Training, as indicated by an overall mean value of 4.12 (Table 9). Most of them obtained good industrial training experiences which enriched their theoretical and research exposure while at the School of Biosciences and Biotechnology.

TABLE 9. The average mean value of preparedness in industrial training

Preparedness in industrial Training	Mean $\pm$ SE
Planning and executing research	3.91 $\pm$ 0.69
Adaptability to work environment	4.30 $\pm$ 0.62
Interpersonal skills	4.15 $\pm$ 0.65

According to Azian and Mun (2011), a survey conducted by the Malaysian Employers Federation showed that 68% of employers named communication skills as being the most needed skill in a job application. This was followed by work experience (67%), interpersonal skills (56.2%), passion and commitment (55.7%), being a team player (47.8%), having the right degree (46.3%), good academic results (37.9%), a desire to learn (37.9%), ability to work well under pressure (34.0%), and ability to take the initiative (32.5%). A survey conducted by Nor'Aini Yusof et al. (2013) to 179 employers who offered 12 weeks of industrial training for 186 students from Universiti Teknologi Malaysia (UTM), agreed that industrial training is considered to be an effective tool to enhance graduates' employability. Employers

also suggested improvements could be made in the use of computer software, communication, behaviour, management skills, law and policy, and creativity. Overall, most surveys showed good academic result with combination of communication skills, and soft skills are important elements to be successful in job commitment.

#### SECTION D: THE OVERALL EVALUATION OF THE SCHOOL OF BIOSCIENCES AND BIOTECHNOLOGY, FACULTY OF SCIENCE AND TECHNOLOGY, UKM

Overall results obtained from the survey showed that respondents agreed that graduates from UKM were very likely to find employment (4.08). Furthermore, respondents rated an average mean value of 4.02 when it came to giving feedback on the School of Biosciences and Biotechnology, UKM. The lowest average mean value of 3.22 was on whether the programme fulfilled and exceeded their expectations. The overall average mean value of 3.26 for section (D) suggested that respondents were satisfied with the programme offered and that their expectations of being prepared for a future career were met. We believe that the students came with high expectations of the university based on its reputation as an IHL. They believed that the school had trained them well for the world of work.

However, through personal communication, the shortcomings associated with the school were mostly based on the lack or shortage of good facilities in the university and the lackluster customer service received from staff manning the front desks etc. For the purpose of this survey, this finding did not in any way indicate that the curriculum and training were below expectation but it is a message to the university that the available facilities need to be upgraded. We hope that the university would respond and look into these requirements to improve on customer rating of the institution. While students' opinions should not dictate change to the curriculum, tools and environment for learning, they nevertheless provide valuable insights that should be considered.

#### CONCLUSION

Based on final year students' perceptions, all the seven programmes offered by the School of Biosciences and Biotechnology met students' expectations in terms of the components, knowledge, general skills, virtues, and quality of the academic staff. Therefore, it can be concluded that the University had prepared the graduates for work and for them to embark on their future career, ready to face the challenges and demands of work life.

Good IHLs are ones that are devoted to improving the quality of its curricular contents in line with academic development and technological advances in the related field. The curriculum and teaching methods have to be up-to-date and regularly evaluated and revised so as to keep abreast with the ever increasing and regularly changing demands and requirements of the job market.

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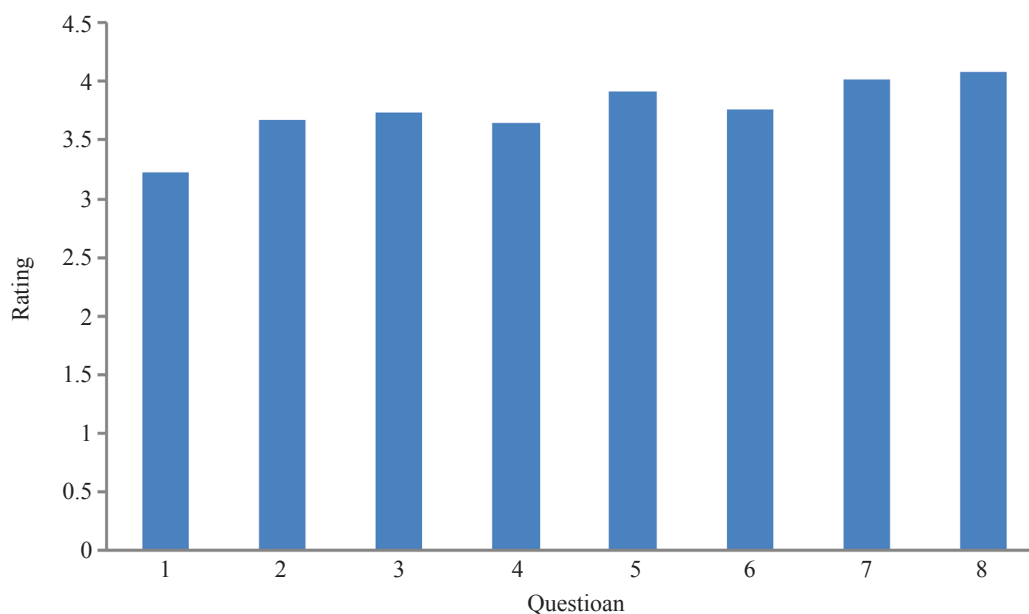


FIGURE 2. The average mean value for the overall evaluation of the School of Biosciences and Biotechnology, Faculty of Science and Technology, UKM

## Questions:

1. Undergraduate programmes fulfill expectations.
2. Rating for the overall value of the education received from the School of Biosciences and Biotechnology.
3. Satisfaction with the undergraduate programme received from the School of Biosciences and Biotechnology.
4. Recommendation of the programme to family and friends.
5. Recommendation of the School of Biosciences and Biotechnology as a place to study.
6. Joining the School of Biosciences and Biotechnology's alumni.
7. Feedback on the School of Biosciences and Biotechnology graduates.
8. Hiring UKM graduates when recruiting NB.

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