Second Chance Science Education for School Leavers

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Abstract

A special programme, Pre-Science programme was developed by Universiti Teknologi MARA to provide a second chance for school leavers who failed to fulfil the minimum university requirement entries upon completion of upper secondary schools. Students who were from the sciences medium of schooling but just lacked credit in sciences or mathematics or English subjects but have satisfied the overall minimum requirement can be enrolled for this programme. Students who are from poor family and rural secondary schools are given priority as they may have not excelled due to the poor learning and teaching facilities they may have had. The students were given one semester to improve their basic knowledge in sciences, mathematics and English subjects before they can enrol for diploma courses. The programme also stress on enhancing the students’ soft skills through structured activities carried out in and outside the classrooms. Students are also closely guided and monitored in their study so as they can do well within this short period of intensive programme. Students who do well in one semester will be offered science based diploma courses while those who failed to achieve the necessary grades will be given another semester to work hard and improve themselves before they enrol into the diploma courses. This programme has trained and increased the academic ability of school leavers to the level required to attend science based diploma courses successfully. Hence, the programme should be continued as it will directly support Nation Vision 2020.

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Keywords: second chance; science education; school leavers
1. Introduction

Malaysia has shifted from production-based economy to a knowledge-based economy. It is a pathway towards Nation’s Vision 2020 (Ramli Mustapa & Abu Abdullah, 2006). As a road map towards the knowledge-based economy, the Malaysia Government has put in effort towards achieving this target under the Tenth Malaysia Plan 2011-2015 (Hidayah Mohd Fadzil & Rohaida Mohd Saat, 2014). In gearing into this, there is a critical need for Malaysia and Sarawak in particular to develop its competitive edge to remain resilient on the world stage, especially on the economic front. Human capital trained in the science and technology will be of a great demand for Malaysia to achieve its vision of 2020 (Raslan Ahmad & Ahmad Razif Mohamad, 2013).

In 2013, Sarawak’s economy grew 4.2 percent (Department of Statistics Malaysia, 2013). The development of Sarawak has been underpinned by stronger domestic demand resulted from the economic activities of on-going projects in the Sarawak Corridor of Renewable Energy (SCORE) and projects under the Tenth Malaysia Plan. Under SCORE, the Sarawak government is projecting 1.6 millions job opportunities upon completion in the year 2030. To better prepare the young generation to the demand of SCORE’s workforce, the Sarawak state government has set up a consortium of public and private institutions of higher learning in the state (U-SCORE) to monitor the said plan (Grapragasem et al., 2014).

To be in line with the government policy, the ministry of higher education of Malaysia has formulated two education plans, National Higher Education Action Plan NHEAP) 2007-2010 and NHEAP beyond 2020 to closely support the government policy in achieving the ratio 60:40 (Science: Arts). The ratio policy was failed after 42 years (Ministry of Education, 2012). This was also reported by Tuan Mastura Tuan Soh and Tamby Subahan Mohd Meerah (2013) in their analysis of students pursuing science stream in the past 10 years.

This challenge of achieving the Ratio Policy is even tougher for the state of Sarawak due to its vast area with limited infrastructure, lack of good schools and small population. The state government and relevant agencies in Sarawak tried to reduce this disparity by introducing some programmes and incentives to reduce the students drop outs from the science and technology courses and at the same time motivate them to take up science subjects.

As one of the earliest university that provides tertiary education in the Sarawak state, Universiti Teknologi MARA (UiTM) is sensitive to this pressing demand. In addition, UiTM is a largest public university with campuses in all the states in Malaysia. It visions and missions are tailored to support the government development needs which include the nation aspiration of Vision 2020. Furthermore, the university provides programmes for skill training, focusing in the field of science and technology for Bumiputra of Malaysia that includes natives of Sarawak. One step under taken by UiTM is the introduction of a programme called Mengubah Destini Anak Bangsa (MDAB).

The programmes aim to give second chance education to school leavers for both science and commerce. The MDAB science programmes is called Pre-Science Programmes where the MDAB commerce programmes is name Pre-Commerce programmes.

This paper aims to share the experience and provide some analysis gathered when carrying out Pre-Science Programmes at Universiti Teknologi MARA Sarawak. The programme has proven to increase the number of students in the science and technology courses by giving the students the second chance to improve themselves so as they meet a level that allow them to enroll to the diploma course.

2. The Pre-Science programme

MDAB meant as reshaping the native child’s destiny. The MDAB was suggested by our Prime Minister Datuk Seri Mohammad Najib Bin Tun Abdul Razak in 2010. The suggestion of Prime Minister Malaysia is aligned with our university philosophy which believe that “every individual has the ability to attain excellence through the transfer of knowledge and assimilation of moral values so as to become professional graduates capable of developing knowledge, self, society and nation” if they are to be given a chance. Therefore, the preparatory programme known as MDAB was first offered in June 2010. Through this programme, Bumiputras students from poor family and did not have enough grade achievement to entered the diploma courses are given a second chance to improve themselves before they can be enrolled to a diploma courses upon completing the MDAB programme.
successfully. The main focus of this MDAB is to provide better understanding for Mathematics and English a requirement which they lacked if they were to enrol to diploma courses. A similar programme with the same aim of reshaping the native child’s destiny is offered to science stream students and it is called MDAB Pre-Science or simply Pre-Science. The programme is to support the rapid development of Sarawak that has been experiencing a shortage of skilled science and technically manpower support.

The Pre-Science programme enrolled *Bumiputra* school leavers who were not able to meet the diploma course requirement but just short due to not having enough credits to meet the requirement of the university. It is not possible to level the enrolment requirement for all students within a short period of 6 months to one year, a time frame for the Pre-Science. Hence the focus is on students who are close to meeting the diploma course requirement. With the understanding that the poor infrastructure and unconducive teaching and learning environment available at the schools, the students performance may have been hampered. Therefore these students should be given a second chance. A study by Othman Talib et al., (2009) indicated that one of the attributes for lack of motivation in studying science is the environment factor.

Through this programme, school leavers are given a second chance to reshape their destiny by providing better facilities, trained lecturers and financing aids so that these students study with minimized living pressure. For some needy students, the aid provided by the university includes the travelling expenses from their home to the university. Students’ tuition fees are waived, their accommodation is free and the students are given full or partial living allowance based on their family financial status. In providing this financial aid, university is supported by university trust fund and donations from individuals other agencies in Malaysia.

The Pre-Science programme focuses on basic sciences and mathematics. The minimum duration of this programme is one (1) semester (Part i) which can be extended to two (2) semesters (Part II) depending on the student’s performance. Each semester takes 14 weeks to complete. The courses offered are Biology, Chemistry, Physics, Mathematics, English and Human Development. More contact hours is given on English course so as to provide students with stronger foundation in the language which is needed to continue their diploma courses successfully.

After one semester, those with grade point average (GPA) greater or equal to 3.0 will be enrolled to one of our diploma courses. Students with GPA less than 2.0 will be dropped from the programme. The rest will be given another semester to improve on their basic skills in science, mathematics and English. In their second semester, five subjects will be offered with three science courses namely Biology, Chemistry, Physics, advance mathematics and English II. Only those who can achieve Cumulative Grade Point Average (CGPA) 3.0 or more will be offered one of the diploma courses in UiTM.

The certificate obtained in Pre-Science Programme is equivalent to the qualification of the Malaysian Certificate of Education (SPM) which is a national examination taken by all fifth-year secondary school students. The SPM qualification is the qualification used by the local universities for diploma level intake.

Upon completion of the programme, candidates may further their studies in any science and technology based diploma programmes in UiTM. Examples of the programmes that these candidates can enroll are:

i) Diploma in Science  
ii) Diploma in Environmental Science  
iii) Diploma in Nursing  
iv) Diploma in Engineering  
v) Diploma in Building Management  
vi) Diploma in Quantity Surveying  
vii) Diploma in Sport Science  
viii) Diploma in Plantation  
ix) Diploma in Computer Science

The modes of teaching to these students are varied. Beside the formal chalk and talk lessons, students were involved with activities to boost their motivation and interest in their science and mathematics subjects. Examples of the activities carried out for the students are Motivation Talk, Mathematics Clinic, Yes to Science and Mathematics, Mathematic Motivation Camp and Science Clinic. Other activities to enhance the student’s soft skills are Readers
Theatre; English is Fun and Public Speaking.

3. Outcome of the programme

The result of Part 1, MDAB Pre-Science Students for the last four semesters is shown in Table 1. The third column in Table 1 shows the number of students who had completed the programme. These students scored the average of 70 marks and above. This group of students were offered a diploma course. The fourth column shows the number of students who had passed all papers and for each cohort, at least 40.66% was able to score an average marks of 50 to 70. These students continued to Part II MDAB programme to improve their basic skills in science. The last column shows the number of students who failed to performed in the MDAB Pre-Science Programmes. The students were dropped out from the programme.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number of students</th>
<th>Number of students completed (%)</th>
<th>Number of students passed (%)</th>
<th>Number of students failed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June -October 2012</td>
<td>63</td>
<td>23(36.51)</td>
<td>26(41.27)</td>
<td>14(22.22)</td>
</tr>
<tr>
<td>December 2012-Mac 2013</td>
<td>18</td>
<td>6(33.33)</td>
<td>9(50.00)</td>
<td>3(16.67)</td>
</tr>
<tr>
<td>June -October 2013</td>
<td>91</td>
<td>34(37.36)</td>
<td>37(40.66)</td>
<td>20(21.98)</td>
</tr>
<tr>
<td>December 2013-Mac 2014</td>
<td>20</td>
<td>7(35.00)</td>
<td>12(60.00)</td>
<td>1(5.00)</td>
</tr>
</tbody>
</table>

The result of the Part II, MDAB Pre-Science Students of the above batches of students is displayed in Table 2. Only three cohort of students’ result are shown in Table 2. Not all students who were given another semester completed their Pre-Science Programme. A few decided to quit and from the records kept, three students quitted the programme for the December 2012-Mac2013 cohort and four students quit the December 2013-Mac 2014 cohort. The rate of success after following the programme on an extended semester is very high. Based on the last three semesters results, at least 77.8% were able to proceed to the diploma courses and percentage of dropped was as low as 6.1%.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number of students</th>
<th>Number of students completed (%)</th>
<th>Number of students failed (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>December 2012-Mac 2013</td>
<td>23</td>
<td>21(91.30)</td>
<td>2(8.7)</td>
</tr>
<tr>
<td>June -October 2013</td>
<td>9</td>
<td>7(77.78)</td>
<td>2(22.22)</td>
</tr>
<tr>
<td>December 2013-Mac 2014</td>
<td>33</td>
<td>31(93.90)</td>
<td>2(6.1)</td>
</tr>
</tbody>
</table>

The result of the overall students who were enrolled to the diploma courses through this programme is shown in Table 3. Note that some students from the intake of December 2013-Mac 2014 were still in semester II of the Pre-Science programme then and therefore, only three cohorts were recorded to have completed the said programme.

<table>
<thead>
<tr>
<th>Semester</th>
<th>Number of students</th>
<th>Completed (%)</th>
<th>Fail (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>June -October 2012</td>
<td>60</td>
<td>44(73.33)</td>
<td>16(26.67)</td>
</tr>
<tr>
<td>December 2012-Mac 2013</td>
<td>18</td>
<td>13(72.22)</td>
<td>5(27.78)</td>
</tr>
<tr>
<td>June -October 2013</td>
<td>87</td>
<td>65(74.71)</td>
<td>22(25.29)</td>
</tr>
</tbody>
</table>

Overall, the rate of completing the programme successfully was at least 72.22%. The highest failure rate was on semester December 2012-Mac2013 with 27.78%. In other words, the programme managed to salvage the Science students by giving them a second chance to pursue their study in tertiary science educations.
4. Conclusion

The main purpose of offering the MDAB Pre-Science Programme is to give a second chance to school leavers who did not meet the minimum requirement of entries for tertiary education programmes. UiTM have taken the initiative to give the second chance especially to rural and poor native students to continue their science education. The programme was in line with Sarawak government SCORE project and Nation Vision 2020. From the output of the programmes, the MDAB Pre-Science Programme has trained and increased the academic ability of school leavers to the level required to attend their science based diploma courses successfully. Hence, the programme should be continued by UiTM to contribute to the effort in Ratio Policy and to support the demand of workforce under SCORE and Nation Vision 2020.

References