Descriptive Analysis of Extra-Curricular Program Outcome Attainment: A Case Study of Universiti Malaysia Pahang

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This study presents the descriptive analysis of students' performance in extra-curricular activities at Universiti Malaysia Pahang (UMP) for all bachelor degree students from year 2015 to 2018. A new reporting mechanism and formula, known as Extra-Curricular Cumulative Grade Point Average (XCGPA), is proposed for assessing the students' involvement in extra-curricular program organised by UMP. The data analysed is merit scores obtained by students from joining the extra-curricular activities during their study period in UMP. The merit scores are categorized into involvement, role and achievement with different weightages based on students' level of involvement. The total merit scores from each category will be mapped between the intended core values and the targeted attributes. There is a threshold merit score for each attribute to be obtained by the student per semester and for the study duration. Then, the percentage score for each attribute is calculated and classified according to six Student Personality Trait Classifications. The students' profile is developed and the attainment for each attribute is presented by a spider web.

Keywords: extra-curricular; descriptive analysis; merit score; spider web; student's profile

I. INTRODUCTION

Any activities conducted outside of the classroom are known as extra-curricular activities. In Malaysia, university students participate in a wide variety of extra-curricular activities. These activities are varied in nature and normally led by certain clubs at the university. Normally, students are involved in such activities to collect merit points and secure a place at any on-campus accommodation for the next semester. It is proven that legibility, social relation, hostel quality, facilities, extra-curricular activities, accessibility, safety, comfort, academic services and transportation affect student inclusion at university campuses in Malaysia, (Sedaghatnia et al., 2018). However, the involvement in an impactful extra-curricular activity may also help the students develop talents and instill good soft skills.

A high Cumulative Grade Point Average (CGPA) is previously known as one of the important criteria for employability. However, using grades as an indicator in employment received a lot of criticisms and there is a low relationship between grades

and job performance (The Chronicle of Higher Education, 2012; Amstrong, 2012). These findings are also supported by World Economic Forum (2016) where the top 10 skills required for employability by the year 2020 are related to personal development and attitude such as the ability to solve complex problems, critical thinking, creativity, people management, emotional intelligence and cognitive flexibility.

As the Fourth Industrial Revolution unfolds, companies are seeking to harness new and emerging technologies to reach high levels of efficiency in production and services sectors, (World Economic Forum, 2018). Thus employers are now considering other qualities of graduates that can cope well with global challenges. For year 2022, the top 10 skills required for graduates are analytical thinking and innovation, active learning and learning strategies, creativity, originality and initiative, technology design and programming, critical thinking and analysis, complex problem-solving, leadership and social influence, emotional intelligence, reasoning, problem-solving and

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ideation, and systems analysis and evaluation [5]. However, not all the listed skills can be achieved through classroom setting, hence it is important to encourage students to involve in extra-curricular activities to nurture their value added skills.

In Universiti Malaysia Pahang (UMP), it is believed that the students involvement in extra-curriculum activities is important and able to develop them as holistic and balanced individuals. Hence, this study aims to propose a new reporting mechanism for extra-curricular program at UMP using an Extra-Curricular Cumulative Grade Point Average (XCGPA) formula calculated based on the student's merit scores that have been acquired continuously throughout their study period. The merit scores data is analysed and a statistical descriptive analysis is presented to show the capability of the new reporting mechanism in displaying the students' personality traits.

II. EXTRA-CURRICULAR ACTIVITIES IN UMP

In UMP, all the merit score accumulated by the students in extra-curricular programs are recorded by Student Affairs & Alumni Department (*SAffAD*). UMP has carefully designed different ranges of extra-curriculum programs in order to develop a well-balanced student in academic and soft skills aspects. The activities in such program may develop students' sense of identity, innovative, resilient, and good soft skills. The extra-curricular programs are grouped based on the levels of activity involvement, role and achievement categories with different weightages. Figure 1 presents the details of weightage for each level. The weightage distribution of each category is

design based on the characteristics that are important for each category. As example for Activity-based category, the weightages are given based on four characteristics. The characteristics are the student's participation capacity in a program, the level of the program, the performance of the student in the program and the student learning time used for the program. The higher the level of each characteristic, the higher the weightage is given.

In particular, each program is mapped between the intended core values called as Student Affair's Cores and the targeted attributes with different weightages. More than 83 officially recognized societies listed in SAffAD that reflects UMP diverse student population, sporting facilities and breadth of subjects. The societies are divided into eight Student Affair's Cores such as Leadership, Creativity & Innovation, Public Speaking, Volunteerism, Community Service, Culture, Sports & Recreation, and Entrepreneurial. UMP chooses to highlight ten attributes for the students' extra-curricular profiling system and reporting mechanism.

The attributes are social skills; values; attitudes and professionalism; leadership and teamwork skills; problem solving skills; information management & lifelong learning skills; entrepreneurial skills; creativity; unity & patriotism; and volunteerism. These attributes are in line with the Malaysia Education Blueprint 2015–2025 (Higher Education) agenda and Future of Job Report (the top ten skills set) from the 2018 World Economic Forum. Each core value is mapped to four targeted attributes in the ratio of 60:20:10:10 according to the programs's dominant criteria or program outcome attribute as given in table 1.

Weightage Activity Based

CAPACITY	SCORE	LEVEL	SCORE	PERFORMANCE	SCORE	SLT	SCORE
Participant	1	Residential College/Faculty/Club	1	Poor	0.1	1 day	1
Committee	2	University	2	Good	1	2-3 day	2
Supreme	3	District/State/Zone	3	Excellent	1.5	4-7 day	3
		National	4			> 7 day	4
		International	5				

Weightage Role Based

COMMITMENTS	SCORE	RATINGS	SCORE	PERFORMANCE	SCORE
Exco	1	Student Club/PEKA	1	Poor	0.1
Supreme	2	Student Presentative Council	2	Good	1
President/YDP MPP	3			Excellent	1.5

Weightage Achievement Based

ACHIEVEMENT	SCORE	LEVEL	SCORE	PERFORMANCE	SCORE
Participation	1	Residential College/Faculty/Club	1	Poor	0.1
Consolation	2	University	2	Good	1
Top 3	3	District/State/Zone	3	Excellent	1.5
Outstanding	4	National	4		
		International	5		

Figure 1. Weightage for activity involvement, role and achievement level

Table 1. Weightage for program's core values and program outcome attribute

8 STUDENT AFFAIR'S CORE	SOCIAL SKILLS			VALUES, ATTITUDES & PROFESSIONALISM		COMMUNICATION		LEADERSHIP & TEAMWORK SKILLS		PROBLEM SOLVING	INFORMATION MANAGEMENT & LIFELONG LEARNING		ENTREPRENEURIAL SKILLS		CREATIVITY	UNITY & PATRIOTISM		VOLUNTEERISM	TOTAL
	SELF CONFIDENCE	RESPECT & SELF AWARENESS	SOCIAL RESPONSIBILITY	VALUES & ATTITUDE	ETHICS & PROFESSIONALISM	VERBAL COMMUNICATION	WRITTEN COMMUNICATION	LEADERSHIP	TEAMWORK	CRITICAL THINKING	INFORMATION RETRIEVAL & MGMT	INQUISITIVE MIND	ENTR MIND	ENTR SKILLS	INNOVATION	UNITY	PATRIOTISM	VOLUNTEERISM	TOTAL
Leadership				20		10		60		10									100
Creativity & Innovation	10									20	10				60				100
Public Speaking	10					60				10	20								100
Volunteerism	10							10								20		60	100
Community Services		60		10				10								20			100
Culture	10			10											60	20			100
Sport & Recreation				60				10		10						20			100
Entrepreneurial						10					10		60	20					100
	100			100		80		90		50	40		60		140	80		60	800

As an example, suppose a student attend a Public Speaking program as a participant (weightage = 1) at national level (weightage = 4) for three days (weightage = 2) with a good performance scale (weightage = 1). Hence, the total involvement weightage can be calculated as 8. The student will obtain the following accumulated merit score for four different attributes (refer to table 2). The total accumulated scores for each student is calculated when the accumulated scores from all levels of involvement, achievement and role are added.

Table 2. Example of accumulated merit score for a student who involve in Public Speaking activity as a participant (weightage = 1) at national level (weightage = 4) for three days (weightage = 2) with a good performance scale (weightage = 1)

ATTRIBUTES	PUBLIC SPEAKING CORE PROGRAM	ACCUMULATED SCORE (if total involvement weightage is (1*4*2*1=8))
Social Skills	10	80
Communication	60	480
Problem Solving	10	80
Information Management & Lifelong Learning	20	160

III. EXTRA-CURRICULAR CUMULATIVE GRADE POINT AVERAGE (XCGPA) FORMULA

In this study, the Extra-Curricular Cumulative Grade Point Average (XCGPA) formula is calculated based on the percentage of student's merit scores that has been achieved continuously throughout their study period. Based on the preliminary descriptive analysis, it is found that UMP students are actively participated in extra-curricular program for a maximum of 4 to 5 semesters only. Due to this reason, for each attribute, a fixed maximum merit score needed per semester and for the whole year of study is set (refer to table 3). Then, the percentage score for each attribute is calculated.

The percentage score for each particular semester is defined as Extra-Curricular Grade Point Average (XGPA), while the cumulative percentage score for the whole study duration is known as Extra-Curricular Cumulative Grade Point Average (XCGPA). The XGPA and XCGPA formula for each attribute are as follows.

$$XGPA_{attribute} = \frac{Merit\ score\ per\ semester}{Max\ score\ per\ semester} \times 100\% \quad (1)$$

$$XCGPA_{attribute} = \frac{Total\ Merit\ score\ per\ semester}{Total\ Max\ score\ per\ semester} \times 100\% \quad (2)$$

In this study, the percentage score for each attribute is classified according to six Student Personality Trait Classifications given in table 4. Then, the students' profile will be developed and the attainment for each attribute will be presented by a spider web that contain all the ten attributes. However, the final report will only highlight the top five attributes that best represent each student acquired competencies.

Table 4. Student Personality Trait Classifications

PERCENTAGE SCORE	PERSONALITY TRAIT
80 − 100	Conqueror
70 − 79	Achiever
60 − 69	Survivor
40 − 59	Novice
1 − 39	Seeker
0	Introvert

An illustrative example of the percentage score calculated for a Social Skills attribute of a degree student and the related personality trait classification is displayed in table 5. It is shown that at the end of six semesters, the student who has a very high score in Social Skills is classified as "Conqueror". The same calculation procedure is repeated for all ten attributes.

Meanwhile, an example of the comparative spider web for a student after six semesters of study is shown in figure 2. It can be seen that the student does not obtain excellent XCGPA results for certain attributes like Information management & Lifelong learning skills, Entrepreneurial skills, Creativity, Unity & Patriotism, and Volunteerism. However, the student shows a better performance with excellent XCGPA result if only five attributes are chosen.

Table 5. Example of XGPA and XCGPA for a Social Skills attribute of a degree student

|				Attribute: Social Skills	
Semester	Merit Score Per Semester	Maximum Total Score Per Semester	Maximum Total Score	XGPA	XCGPA
SEM 1, 2015/2016	200	500	500	$\frac{200}{500} \times 100\% = 40\%$ Novice	$\frac{200}{500} \times 100\% = 40\%$ Novice
SEM 2, 2015/2016	1500	500	1000	$\frac{1500}{500} \times 100\% = 300\%$ $\rightarrow 100\%$ Conqueror	$\frac{1700}{1000} \times 100\% = 170\%$ $\rightarrow 100\%$ Conqueror
SEM 1, 2016/2017	520	500	1500	$\frac{520}{500} \times 100\% = 104\%$ $\rightarrow 100\%$ Conqueror	$\frac{2220}{1500} \times 100\% = 148\%$ $\rightarrow 100\%$ Conqueror
SEM 2, 2016/2017	200	500	2000	$\frac{200}{500} \times 100\% = 40\%$ Novice	$\frac{2420}{2000} \times 100\% = 121\%$ $\rightarrow 100\%$ Conqueror
SEM 1, 2017/2018	290	500	2500	$\frac{290}{500} \times 100\% = 58\%$ Novice	$\frac{2710}{2500} \times 100\% = 108.4\%$ Conqueror
SEM 2, 2017/2018	0	500	2500	$\frac{0}{500} \times 100\% = 0\%$ Introvert	$\frac{2710}{2500} \times 100\% = 108.4\%$ Conqueror
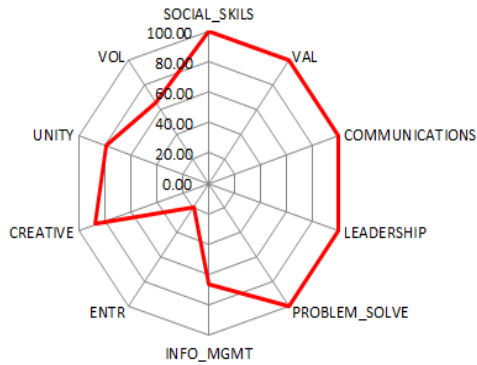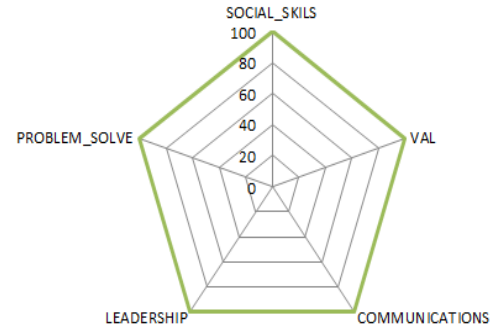
Figure 2. Spider web for a student using 10 attributes and 5 attributes

IV. DESCRIPTIVE ANALYSIS OF UMP EXTRA-CURRICULAR PROGRAM OUTCOME ATTAINMENT

In this study, the extra-curricular data from all bachelor degree programme's students at UMP of year 2015 to 2018 are analysed. A total of 411290 merit score data are used in this study. These data are then grouped by ten attributes and six available semesters. The descriptive summary of the data is displayed in table 6. The summary contains the details on the extra-curricular program outcome attainment based on specific attributes and the classification of personality traits of students. First, it can be seen from the "Introvert"

percentage that almost all bachelor degree students were involved in extra-curricular activities. However, since the activities are not compulsory for all students, the participation is not good given that the percentage of "Seeker" are high for all attributes.

In particular, every semester there is a group of students that are very active in extra-curricular activities and obtain a "Conqueror" score. Furthermore, there is no specific trend of score shown from the table. However, it is worth to note that for the first four semesters, there is a high percentage of "Conqueror" from the Leadership & Teamwork Skills and Creativity attributes. Meanwhile, for the current semesters, there is a decreasing trend for all attributes except for Volunteerism.

Table 6. Descriptive Summary

ATTRIBUTES	SEMESTER	INTROVERT	SEEKER	NOVICE	SURVIVOR	ACHIEVER	CONQUEROR
SOCIAL SKILLS	SEM I 2015/2016	0.00%	59.13%	8.68%	4.34%	3.15%	24.69%
	SEM II 2015/2016	0.00%	53.91%	12.64%	3.69%	2.22%	27.54%
	SEM I 2016/2017	0.01%	48.97%	10.13%	3.46%	3.61%	33.82%
	SEM II 2016/2017	0.00%	54.24%	11.29%	3.81%	3.44%	27.22%
	SEM I 2017/2018	0.00%	61.84%	14.97%	4.01%	3.51%	15.67%
	SEM II 2017/2018	0.00%	72.80%	12.09%	3.61%	2.88%	8.61%
VALUES, ATTITUDES & PROFESSIONALISM	SEM I 2015/2016	0.01%	55.64%	14.36%	4.69%	3.46%	21.84%
	SEM II 2015/2016	0.10%	58.14%	17.56%	5.49%	5.11%	13.60%
	SEM I 2016/2017	0.04%	37.74%	16.74%	6.00%	6.14%	33.34%
	SEM II 2016/2017	0.02%	43.26%	13.38%	4.72%	5.16%	33.45%
	SEM I 2017/2018	0.11%	68.12%	10.57%	3.28%	2.62%	15.29%
	SEM II 2017/2018	0.00%	75.21%	14.57%	3.73%	2.48%	4.02%
COMMUNICATION	SEM I 2015/2016	0.00%	63.53%	16.79%	5.34%	3.97%	10.38%
	SEM II 2015/2016	0.00%	55.99%	13.10%	3.83%	3.15%	23.94%
	SEM I 2016/2017	0.01%	50.47%	9.28%	1.43%	7.03%	31.78%
	SEM II 2016/2017	0.00%	42.37%	14.76%	1.26%	7.27%	34.35%
	SEM I 2017/2018	0.00%	51.97%	17.27%	5.12%	4.61%	21.03%
	SEM II 2017/2018	0.00%	65.78%	11.80%	3.07%	3.44%	15.91%

LEADERSHIP & TEAMWORK SKILLS	SEM I 2015/2016	2.14%	44.24%	5.09%	1.22%	0.74%	46.57%
	SEM II 2015/2016	2.48%	35.27%	9.23%	10.21%	5.70%	37.10%
	SEM I 2016/2017	0.72%	20.00%	0.65%	0.08%	0.10%	78.44%
	SEM II 2016/2017	0.14%	38.72%	1.68%	0.41%	0.35%	58.70%
	SEM I 2017/2018	0.00%	60.45%	21.09%	5.21%	3.82%	9.44%
	SEM II 2017/2018	0.00%	63.99%	17.35%	3.71%	3.29%	11.65%
PROBLEM SOLVING	SEM I 2015/2016	0.00%	47.55%	16.25%	5.17%	3.59%	27.44%
	SEM II 2015/2016	0.00%	44.69%	13.03%	6.87%	3.36%	32.05%
	SEM I 2016/2017	0.00%	19.75%	19.20%	8.08%	7.47%	45.49%
	SEM II 2016/2017	0.00%	38.75%	10.78%	4.24%	4.66%	41.57%
	SEM I 2017/2018	0.00%	56.69%	16.93%	5.72%	3.97%	16.68%
	SEM II 2017/2018	0.00%	62.90%	15.91%	5.86%	4.84%	10.50%
INFORMATION MANAGEMENT & LIFELONG LEARNING	SEM I 2015/2016	0.01%	77.95%	12.52%	2.92%	1.88%	4.72%
	SEM II 2015/2016	0.02%	58.66%	13.34%	3.90%	3.20%	20.88%
	SEM I 2016/2017	0.01%	49.77%	19.97%	7.71%	1.94%	20.59%
	SEM II 2016/2017	0.00%	55.80%	11.60%	4.89%	2.47%	25.25%
	SEM I 2017/2018	0.00%	60.86%	15.82%	2.92%	1.23%	19.17%
	SEM II 2017/2018	0.01%	69.60%	14.25%	4.92%	2.97%	8.24%
ENTREPRENEURIAL SKILLS	SEM I 2015/2016	0.01%	34.17%	39.75%	0.13%	4.18%	21.75%
	SEM II 2015/2016	0.47%	10.89%	58.68%	0.45%	6.14%	23.36%
	SEM I 2016/2017	0.19%	3.17%	29.78%	0.00%	3.19%	63.66%
	SEM II 2016/2017	0.30%	6.98%	66.20%	0.00%	2.06%	24.46%
	SEM I 2017/2018	0.43%	39.39%	33.38%	1.12%	3.65%	22.02%
	SEM II 2017/2018	0.01%	38.05%	39.91%	0.20%	6.00%	15.82%
CREATIVITY	SEM I 2015/2016	0.01%	43.20%	10.81%	3.99%	5.47%	36.51%
	SEM II 2015/2016	0.00%	41.06%	13.66%	3.22%	4.81%	37.26%
	SEM I 2016/2017	0.01%	35.39%	13.53%	3.86%	7.89%	39.31%
	SEM II 2016/2017	0.18%	38.50%	15.41%	1.39%	8.66%	35.86%
	SEM I 2017/2018	0.06%	61.24%	9.55%	5.36%	3.78%	20.00%
	SEM II 2017/2018	0.01%	69.60%	10.56%	4.97%	3.22%	11.64%
UNITY AND PATRIOTISM	SEM I 2015/2016	0.00%	66.15%	11.35%	4.04%	2.45%	16.02%
	SEM II 2015/2016	0.00%	71.38%	13.99%	4.58%	2.73%	7.33%
	SEM I 2016/2017	0.00%	54.81%	13.60%	4.38%	3.42%	23.79%
	SEM II 2016/2017	0.02%	61.53%	16.18%	5.78%	3.63%	12.85%
	SEM I 2017/2018	0.03%	71.21%	10.41%	3.65%	2.67%	12.03%
	SEM II 2017/2018	0.00%	87.01%	9.35%	2.02%	0.63%	0.99%
VOLUNTEERISM	SEM I 2015/2016	0.04%	60.07%	6.16%	3.02%	3.40%	27.29%
	SEM II 2015/2016	0.04%	60.07%	6.16%	3.02%	3.40%	27.29%
	SEM I 2016/2017	0.03%	53.67%	18.09%	2.49%	3.46%	22.27%
	SEM II 2016/2017	0.30%	47.76%	16.41%	0.17%	9.82%	25.54%
	SEM I 2017/2018	0.04%	59.62%	7.18%	3.40%	2.98%	26.79%
	SEM II 2017/2018	0.01%	37.48%	5.17%	2.39%	1.05%	53.90%

V. CONCLUSION

This study demonstrated the capability of the new reporting mechanism of extra-curricular activities at UMP in displaying the students' personality traits. A quantitative approach is used in which the extra-curricular data are analysed statistically and mathematical formula called XCGPA is proposed. UMP is believed to be the first university to introduce XCGPA in evaluating extra-curricular activities based on the merit score accumulated throughout the student's study period. The descriptive analysis show that the students' profile report based on XCGPA formula is relevant and could be applied by other academic institutions. The spider web report may assist students in understanding their unique behaviours, interest and abilities, through the

students' personality traits as well as giving chances to recruiters and employers in hiring a more suitable candidate for their company.

VII.   REFEREENCES

Amstrong, JS 2012, 'Natural Learning in Higher Education' Encyclopedia of the Sciences of Learning.

Sedaghatnia, S et al. 2018, 'Determinants of Student Social Inclusion in Malaysian Universities', Asian Journal of Behavioural Studies (AjBeS), vol. 3, no. 12, pp 53-62.

The Chronicle of Higher Education 2012, The Role of Higher Education in Career Development: Employer Perceptions, Retrieved from www.chronicle.com.

World Economic Forum 2016, Future of Job Report.

World Economic Forum 2018, Future of Job Report.