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INNOVATING EDUCATION FOR A BETTER TOMORROW

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Automated e-Rubric Calculator for Final Year Project Assessment

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Abstract

The final year project (FYP) is synonym for final year students at the university level. Lecturers will be appointed as supervisors to supervise these students, and also as examiners to evaluate other FYP students. At a later stage of the subject, lecturers are required to evaluate all students according to the given assessment rubrics. The Automated E-Rubric Calculator for Final Year Project Assessment is an innovation from traditional paper rubric marking into a systematic design of computerized assessment. The idea was sparked and designed due to the complexity and tedious marking process a lecturer must undergo every semester the FYP subject is offered. The complexity includes the weightage set for each item using decimal numbers. Because it is currently manually calculated, the marks given are also at risk of error. The existence of the system is able to assist users, that are lecturers and academicians that require focus while doing the assessment. There will be no more manual calculations required because of the automated e-rubric calculation features in the developed system. With a computerized system to compute FYP marks, lecturers have more time to spend on other impactful projects and tasks. Overall, the education sector will be benefited from the Automated E-Rubric Calculator for Final Year Project Assessment because lecturers have a better, and more systematic rubric system developed for them.

Keywords: automated, constructive alignment, final year project, rubric, supervision

Background of the Research/ Innovation/ Invention/ Design

Well-developed rubrics signal good application of constructive alignments in teaching and assessment to achieve the respective course learning outcomes (Ragupathi & Lee, 2020). However, some may find the complexity of a rubric tedious to be filled in (McKnight, Bennett & Webster, 2020). The final year project (FYP) is very synonym with final year students at a university. Lecturers will be appointed as supervisors to supervise these students, and also as examiners to evaluate other FYP students. Later, lecturers are required to evaluate according to the given assessment rubrics. Altogether, for FYP in the Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, there are seven (7) assessment rubrics for every single research project; including reflective notes I & II, video presentation, research proposal, colloquium paper, e-poster presentation, and lastly final thesis rubrics. Table 1 illustrated the general information of the FYP subject

Table 1: FYP Course Learning Outcomes (CLOs) and Assessment Marking Percentage

AXS4112 FINAL YEAR PROJECT I	AXS4113 FINAL YEAR PROJECT II
Course Learning Outcome: 1. Demonstrates integrity, ethics, focus and maintains discipline in completing research proposal (PLO2, C3) 2. Propose a research framework based on research problems and literature review (PLO10, A3) 3. Identify appropriate research methods to solve research problems and questions (PLO11, A4) **Rubrics:** 1. Reflective Notes I (20%) 2. Video Presentation (20%) 3. Research Proposal (60%)	**Course Learning Outcome:** 1. Demonstrates integrity, ethics, focus and maintains discipline in achieving research objectives (PLO2, C3) 2. Organise the objectives, methods, research framework and findings based on the research problem (PLO10, A4) 3. Complete the research report based on the final year research project guidelines (PLO11, A4) **Rubrics:** 1. Reflective Notes II (20%) 2. Colloquium Paper (10%) 3. E-poster Presentation (20%) 4. Final Thesis (50%)

Some faculties need to nominate 10 to 15 research projects for each lecturer to become a supervisor. It means, with a minimum of 10 research projects or 10 students to supervise, a lecturer is required to fill in 70 assessment rubrics. These rubrics, it consists of almost 60 items to be evaluated, or 600 items for 10 students under their supervision. In addition to becoming a supervisor, a lecturer will also be appointed as an examiner for another 10-15 research projects, which means an additional 70 assessment rubrics or additional 600 items for 10 students examined. Therefore, in total there will be 1200 items from 140 assessment rubrics that need to be calculated by one (1) lecturer on FYP assessment.

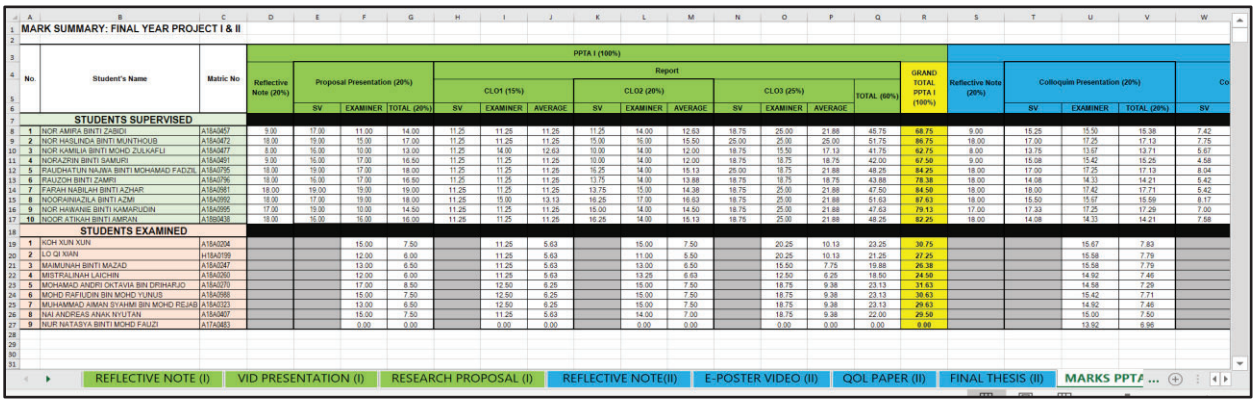
Currently, the rubrics are printed and calculated on paper manually. The weightage set for each element was made using decimals and this has complicated the process of calculating even more. The marks for each item will then need to be totaled for the student supervised, whereas for students examined, marks for items need to be totaled and averaged. As a lecturer that is loaded with other various tasks, it is important for the lecturer to be able to conduct students' evaluations efficiently. If there is a way that able to ease and reduce time spent on the evaluation process due to a well-developed evaluation platform, lecturers will find that completing an evaluation process is effortless in terms of calculating the given marks.

Description of the Research/ Innovation/ Invention/ Design

The *Automated E-Rubric Calculator for Final Year Project Assessment* is developed to minimize human error in manual calculation and ease the process of evaluating FYP projects by the students. The e-rubric calculator starts with formulating all rubrics in Microsoft Excel using the formula function and later expanded into a computerized system to perform the required assessment. The features of the system emphasized the automated e-rubric calculator. There will be no more manual calculations required because of the automated e-rubric calculation features in the developed system.

Using Microsoft Excel, the researcher has transferred all information and items in the original rubric. Each item is now calculated using the formula function provided by the excel system. The lecturer is only needed to fill in the blank with an even number for each item assessed for each student's reports. In the end, the developed system will generate the final marks for each student without lecturers having to manually calculate each item for each rubric which before this need to be totaled and averaged. The final output can be viewed instantly from the report with the

Automated E-Rubric Calculator for Final Year Project Assessment. Figure 1 illustrated the e-rubric calculator in Microsoft Excel format:



MARK SUMMARY: FINAL YEAR PROJECT I & II

No.	Student's Name	Matric No	PPTA I (100%)																				
			Reflective Note (20%)	Proposal Presentation (20%)			Report										GRAND TOTAL PPTA I (100%)	Reflective Note (20%)	Colloquim Presentation (20%)				
							CLO1 (15%)			CLO2 (20%)			CLO3 (25%)			TOTAL (60%)							
				SV	EXAMINER	TOTAL (20%)	SV	EXAMINER	AVERAGE	SV	EXAMINER	AVERAGE	SV	EXAMINER	AVERAGE				SV	EXAMINER	TOTAL (20%)	SV	
	STUDENTS SUPERVISED																						
1	NOR AMIRA BINTI ZABIDI	A18A0457	9.00	17.00	11.00	14.00	11.25	11.25	11.25	11.25	14.00	12.63	18.75	26.00	21.88	48.75	68.75	9.00	15.25	15.50	15.38	7.42	
2	NOR HASLINDA BINTI MUNTHOUB	A18A0472	18.00	19.00	15.00	17.00	11.25	11.25	11.25	15.00	16.00	15.50	25.00	25.00	25.00	51.75	86.75	18.00	17.00	17.25	17.13	7.75	
3	NOR KAMILIA BINTI MOHD ZULKAFLI	A18A0477	8.00	16.00	10.00	13.00	11.25	14.00	12.63	10.00	14.00	12.00	18.75	15.50	17.13	41.75	62.75	8.00	13.75	13.67	13.71	5.67	
4	NORAZRIN BINTI SAMURI	A18A0491	9.00	16.00	17.00	16.50	11.25	11.25	11.25	10.00	14.00	12.00	18.75	18.75	18.75	42.00	67.50	9.00	15.08	15.42	15.25	4.58	
5	RAUDHATUN NAJWA BINTI MOHAMAD FADZIL	A18A0795	18.00	19.00	17.00	18.00	11.25	11.25	11.25	16.25	14.00	15.13	25.00	18.75	21.88	48.25	84.25	18.00	17.00	17.25	17.13	8.04	
6	RAUZOH BINTI ZAMRI	A18A0796	18.00	16.00	17.00	16.50	11.25	11.25	11.25	13.75	14.00	13.88	18.75	18.75	18.75	43.88	78.38	18.00	14.08	14.33	14.21	5.42	
7	FARAH NABILAH BINTI AZHAR	A18A0581	18.00	19.00	19.00	19.00	11.25	11.25	11.25	13.75	15.00	14.38	18.75	25.00	21.88	47.50	84.50	18.00	18.00	17.42	17.71	5.42	
8	NOORAINIAZILA BINTI AZMI	A18A0992	18.00	17.00	19.00	18.00	11.25	15.00	13.13	16.25	17.00	16.63	18.75	25.00	21.88	51.63	87.63	18.00	15.50	15.67	15.59	8.17	
9	NOR HAWANIE BINTI KAMARUDIN	A18A0995	17.00	19.00	10.00	14.50	11.25	11.25	11.25	15.00	14.00	14.50	18.75	25.00	21.88	47.63	79.13	17.00	17.33	17.25	17.29	7.00	
10	NOOR ATIKAH BINTI AMRAN	A18B0438	18.00	16.00	16.00	16.00	11.25	11.25	11.25	16.25	14.00	15.13	18.75	25.00	21.88	48.25	82.25	18.00	14.08	14.33	14.21	7.58	
	STUDENTS EXAMINED																						
1	KOH XUN XUN	A18A0204			15.00	7.50		11.25	5.63		15.00	7.50		20.25	10.13	23.25	30.75			15.67	7.83		
2	LO QI XIAN	A18A0199			12.00	6.00		11.25	5.63		11.00	5.50		20.25	10.13	21.25	27.25			15.58	7.79		
3	MAIMUNAH BINTI MAZAD	A18A0247			13.00	6.50		11.25	5.63		13.00	6.50		15.50	7.75	19.88	26.38			15.58	7.79		
4	MISTRALINAH LAICHIN	A18A0260			12.00	6.00		11.25	5.63		13.25	6.63		12.50	6.25	18.50	24.50			14.92	7.46		
5	MOHAMAD ANDRI OKTAVIA BIN DRIHARJO	A18A0270			17.00	8.50		12.50	6.25		15.00	7.50		18.75	9.38	23.13	31.63			14.58	7.29		
6	MOHD RAFIUDIN BIN MOHD YUNUS	A18A0588			15.00	7.50		12.50	6.25		15.00	7.50		18.75	9.38	23.13	30.63			15.42	7.71		
7	MUHAMMAD AIMAN SYAHMI BIN MOHD REJAB	A18A0323			12.00	6.50		12.50	6.25		15.00	7.50		18.75	9.38	23.13	29.63			14.92	7.46		
8	NAI ANDREAS ANAK NYUTAN	A18A0407			15.00	7.50		11.25	5.63		14.00	7.00		18.75	9.38	22.00	29.50			15.00	7.50		
9	NUR NATASYA BINTI MOHD FAUZI	A17A0483			0.00	0.00		0.00	0.00		0.00	0.00		0.00	0.00	0.00	0.00			13.92	6.96		

REFLECTIVE NOTE (I) | VID PRESENTATION (I) | RESEARCH PROPOSAL (I) | REFLECTIVE NOTE(II) | E-POSTER VIDEO (II) | QOL PAPER (II) | FINAL THESIS (II) | MARKS PPTA ...

Figure 1: E-Rubric Calculator in Microsoft Excel Format

Significance of the Research/ Innovation/ Invention/ Design

There are risks of misplaced completed rubrics at the end of the semester. In addition to that, the complexity of each rubric must be manually calculated following the weightage of each item, which leads to the possibility of human error in calculating the total marks. As a lecturer that is loaded with other various tasks, it is important for the lecturer to be able to conduct students' evaluations efficiently. With a computerized system to compute FYP marks, lecturers have more time to spend on other impactful projects and tasks.

Impact of the Innovation/ Invention/ Design Towards Education or Community

The *Automated E-Rubric Calculator for Final Year Project Assessment* will benefit lecturers who have been appointed as supervisors and examiners of FYP. It will provide a systematic assessment process and improve time efficiency for lecturers in marking the FYPs assessment. It will also reduce the risk of calculation errors and improve the process of assessment with the help of technology and formula setup. Overall, the education sector will be benefited from the E-Rubric Calculator because lecturers have improved and a systematic rubric system developed for them.

Commercialization Potential

The *Automated E-Rubric Calculator for Final Year Project Assessment* is an innovation from traditional paper rubric marking into a systematic design of computerized assessment. It can be applied to FYP programs at other faculties or other universities. It can also be expanded to other subjects in any academic entity. In fact, any assessment can be customized from the system. For those who are interested in the Automated E-Rubric Calculator, customers can just deliver the hard copy of their rubrics and the E-Rubric Calculator can be designed and customized according to the demand. Currently, the system is only available in Microsoft Excel. In the future, with the knowledge of developing apps and generating proper coding, this system can be made simpler and more user-friendly to be utilized.

Conclusion

The *Automated E-Rubric Calculator for Final Year Project Assessment* is designed due to the complexity and tedious marking process of the FYP subject. The existence of the system will able to assist users, that are lecturers and academicians that require focus while doing the assessment. Now the system is well developed in Microsoft Excel, it needs to be transferred into a more friendly interface. It is a challenge for the innovators as we have minimum ability and knowledge to turn this idea into a marketable product, but as a team, we take this as a challenge to expand our knowledge, especially doing any potential innovation project.

Acknowledgement

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