Integration Of Green Skills into The ADTEC JTM Student Curriculum

Eza Monzaid[1*], Azman Hasan[2], Azli Amin Ahmad Raus[3] , Dayangku Suraya Awang Jafar[4], Zuraidy Kadir[5]
[1]ILP Pasir Gudang, [2]University Tun Hussein Onn Malaysia
*ezamonzaid@gmail.com:
azmanh@uthm.edu.my: azliamin.ar@jtm.gov.my;
dayangku@jtm.gov.my: zuraidy@jtm.gov.my

Abstract: The objective of this study is to determine the integration of green skills among students at the Manpower Department Advanced Technology College (ADTEC JTM). The implementation of green skills into the student curriculum is an important step in integrating green skills into the current education system. In addition, it's also to identify the level of implementation in green skills by ADTEC JTM instructors. The implementation of green skills is also one of the alternatives in addressing global environmental issues such as global climate change, pollution problems, and the shortage of natural resources in the world that threaten human life and other living things. The implementation of green skills among ADTEC JTM students is one of the initiatives in helping the country realize the country's economic growth. This emphasis in the student curriculum to increase their awareness and importance of environmental sustainability. This will also able to shape their green sustainability attitudes and practices. This quantitative descriptive survey study uses a set of questionnaire instruments and is analyzed using the Rash Model approach. The implications of this study are expected to help TVET institutions, especially at ADTEC JTM, in strengthening existing student curriculum by emphasizing the implementation of green skills in the student curriculum structure.

Keywords: green skills, student curriculum, sustainability, environmental, ADTEC JTM Student

1.0 INTRODUCTION

Green skills based on the Green Skills Agreement Implementation Plan (2008), namely skills for sustainability (sustainability) are also known as technical skills, knowledge, values and attitudes needed in the workforce to develop and support social, economic and environmental sustainability in business, industry and communities. EcoCanada (2010) also states green skills as skills, training and experience related to technology or materials that can minimize environmental impact. CEDEFOP (2012) also defines green skills as the knowledge, abilities, values and attitudes needed to live, in developing and supporting the formation of a sustainable and resource-efficient society. Green skills are also known as generic skills and specific skills that include the skills, knowledge and attitudes of people involved in and mastering green jobs, APEC (2014). The definition of green skills based on CEDEFOP (2014) is the skills needed by the workforce in all sectors and at all levels to help adapt products, services and processes to changes caused by climate change and environmental requirements and regulations.

The Manpower Department Advanced Technology College (ADTEC JTM) as one of the Technical and Vocational Education and Training (TVET) institutions is responsible for ensuring that the graduates produced meet the needs of the country's industry. However, the issue of unemployed graduates still exists to this day among graduates and this issue is detrimental to human resources. Based on the Ministry of Human Resources' Employment and Labor Statistics Report 2024 stated that graduate unemployment still occurs at 3.3%. The Labor Department's statistics also record that the unemployment rate still occurs in January 2025 at 3.1%. The marketability of graduates is important and the role of the ADTEC JTM is to ensure that graduates are not unemployed and always find a place in the industry. ADTEC JTM needs to take steps to overcome the unemployment problem by emphasizing student skills. Among these skills are green skills that need to be applied to the industrial sector. Green skills have become a new requirement and are increasingly in demand in the industry. TVET institutions

play an important role in producing skilled workers who are able to use technology in green industries and these skills are an urgent need in the job market and need to be mastered by instructors and employees, Strietska-Ilina et al. (2011).

OECD (2012) also stated that green skills will be in demand in all sectors and at all levels of the workforce. This is because the demand for green skills is due to three main trends, namely the implementation of greening requires increased skills and qualification requirements across jobs and industries, the newly emerging green economic activities require jobs, qualifications and related skills and the new structural changes will create a need to realign each sector which will require training of workers for the changes. Green skills are very important especially in green industries and employers have started to look for workers with green skills which are very much needed for sustainable development in the social, economic and environmental spheres, Sern et al. (2017).

Recommendations by the (ILO (2011) also state that efforts to 'green' curricula in various occupational fields are needed to raise awareness of the green skills sector. Integrating green skills into TVET training through the application of skills in the training curriculum is one way to open up more job opportunities in the green economy, Dieter Mertineit (2013). Therefore, green skills development needs to be integrated into broader training and the development of such skills should not be in the form of additional or separate skills development, CEDEFOP (2014). The implementation of green skills is important in education and training that not only provides benefits in the economy but also supports social and environmental sustainability, Yapin et al. (2017).

ADTEC JTM is one of the TVET institutions established to produce skilled and semi-skilled workers to meet the needs of the country's industry. In the Strategic Plan, the Department of Manpower has targeted 50% of the country's skilled workforce and this target is in line with the goals of the National Transformation Plan 2050 Malaysia (2017) which aims to produce a globally competitive workforce. In this regard, curriculum development plays an important role so that it always follows current technology and graduates are born to meet the needs of the industry. Therefore, ADTEC JTM institutions need to play a role because TVET institutions are in the process of becoming centers for sustainable development competencies and to support this process, green technology and green skills need to be incorporated into the training curriculum. This is because TVET education plays a significant role in the economic and social transformation process of sustainable development, Dieter Mertineit (2013). Therefore, these skills need to be fostered at the institutional level, especially in the development of student curricula. Researchers found that there is no specific syllabus structure for students' green skills in the curriculum.

Therefore, the general objective of this study is to determine the sub-elements of green skills for students that need to be implemented by ADTEC JTM instructors in the student curriculum based on three research questions. The first research question is to determine the sub-elements of green skills based on Personal Effectiveness Competencies that need to be implemented by ADTEC JTM instructors in the student curriculum. The second research question is to determine the sub-elements of green skills based on Academic Competencies that need to be implemented by ADTEC JTM instructors in the student curriculum. The third research question is to determine the sub-elements of green skills based on Workplace Competencies that need to be implemented by ADTEC JTM instructors in the student curriculum.

2.0 METHODOLOGY

This study is a quantitative descriptive study by distributing the research instrument to 325 respondents consisting of instructors across 33 ADTEC JTM. The study population includes a total of 2101 instructors in the five southern zones, central zone, northern zone, East Coast zone and Borneo zone of ADTEC JTM. Based on the Krejcie and Morgan (1970) Table, the sample size required in this study is 325 respondents and a total of 325 instructors are involved in the actual survey study as shown in Table 1.

Table 1
Number of research respondent

Zone	ADTEC JTM Campus	Number of Instructor
South	Melaka	13
	Batu Pahat	47
	Bukit Katil	11
	Selandar	6
	Tangkak	8
	Pasir Gudang	19
	Mersing	10
Middle	Shah Alam	13
	Kuala Lumpur	1
	Kuala Langat	7
	Pedas	15
North	JMTI	10
	ADTEC Taiping	9
	ADTEC Kulim	0
	Ipoh	18
	Kepala Batas	8
	Arumugam Pilai	6
	Perai	7
	Jitra	13
	Kangar	7
East	Kemaman	10
	Jerantut	0
	Kota Bharu	21
	Kuala Terengganu	9
	Marang	6
	Kuantan	11
Borneo	Bintulu	13
	Kota Samarahan	8
	Miri	12
	Labuan	40
	Kota Kinabalu	3
	Sandakan	5
	Serian	0
	Total :	**325**

2.1 Research instrument

The research instrument used is a set of questionnaires which in total contain 108 items using a Likert scale with five answer options namely Strongly Disagree (STS), Disagree (TS), Unsure (TP), Agree (S) and Strongly Agree (SS) such as. The research instrument distributed contains elements of green skills under the construct of personal effectiveness competence which consists of five elements, academic competence which consists of six elements and eleven elements for competence in the workplace as in Table 2. All elements of green skills were obtained based on interview sessions with experts.

Table 2
Green Skills Element

Competencies	Green Skills Element	Number of item
Personal Effectiveness Competencies	1. Interpersonal skills	**5**
	2. Integrity	7
	3. Profesionalisme	3
	4. Willingness to learn	6
	5. Long life learning	5
Academic Competencies	6. Reading and writing	6
	7. Mathematics	3
	8. Science	3
	9. Computer basic	5
	10. Engineering and Technology	5
	11. Critical and analytical thinking	5
Workplace Competencies	12. Teamwork	5
	13. Following Instructions	6
	14. Planning and scheduling skills	6
	15. Planning and operations skills	6
	16 Adaptibility and flekxibility	5
	17. Equipment and technology skills	4
	18. Marketing and focus customer skills	4
	19. Problem solving and decision making skills	3
	20. Inspecting, reviewing and recording skills	6
	21. Sustainability skills	6
	22. Entrepreneurship skills	4
	JUMLAH :	**108**

2.2 Rasch Model Measurement Approach

This study uses Winsteps software version 3.69.1.11 based on the Rasch measurement model approach. Winsteps software is an alternative for analyzing study data because based on Bond & Fox (2015) measurement using the model can produce good measurements. Based on Sumintono & Widhiarso (2013) Rasch Measurement Model is an analytical tool to test and validate an instrument and has certain advantages. Rasch Measurement Model fulfills five principles of measurement models, namely (i) the ability to provide linear scales with the same

interval (ii) can make predictions for missing data (iii) can provide more accurate estimates (iv) can identify model inaccuracies (v) can produce replicable measurements.

To test the reliability of the instrument developed based on the Rasch Measurement Model, the following analyses were conducted, namely item reliability analysis (item realibility), individual reliability (person realibility), Cronbach's alpha value, individual item separation, item polarity, item dimensionality and item fit. The Cronbach's Alpha value of this study is 0.98 as shown in Table 3. The reliability value shows that this instrument has a high level of consistency in the study in line with the statement of Bond & Fox (2015) that a reliability value exceeding 0.8 is a strong value accepted in the study. The range of values between 0.7 to 0.90 is an acceptable range to allow the study instrument to be used in research based on McMillan & Schumacher (1984) which refers to Table 4 for the Cronbach's Alpha score.

Table 3
Person reliability and respondent separation index value

Alpha Cronbach (α) score	0.98
Person reliability	0.96
Separation index	4.76

Table 4
Alpha Cronbach Score (George & Mallery, 2009)

Alpha Cronbach Score	Assessment
a > 0.9	Excellent
a > 0.8	Good
a > 0.7	Acceptable
a > 0.6	Questionable
a > 0.5	Poor
a > 0.4	Unacceptable

Table 5 also displays the item reliability (item responsibility) which has a value of 0.96. Based on Bond and Fox (2015), a value greater than 0.8 (>0.8) has a high reliability value and has a strong index. The item reliability value obtained by the researcher is 0.70, which is still acceptable because it exceeds the value of 0.6. For the separation index value obtained, 1.54 is still acceptable because it is close to the value of 2.0. The value of a good separation index based on Linacre (2005) is greater than 2.

Table 5
Item reliability and separation index value

Item reliability	0.70
Separation index	1.54

3.0 Data Analysis and Findings

The quantitative approach used in this section to determine the suitability of the student green skills elements that need to be implemented into the ADTEC JTM student curriculum is significant. The mean score test and the measurement score were used to determine the level of instructor agreement based on the agreement score scale in the survey form on the sub-elements of green skills in Personal Effectiveness Competence, Academic Competence and

Workplace Competence. Instructor feedback from the scores on the Likert scale was analyzed using Winsteps software version 3.69.1.11, which is descriptive analysis. The researcher used the method of analyzing data from the questionnaire instrument based on the Levin and Rubin (2000) mean scale interval as shown in Table 6

Table 6
Levin dan Rubin Scale

Level of Agreement	Min Score
Low	1.00 – 2.33
Moderate	2.34 – 3.66
High	3.67 – 5.00

Based on the research analysis, the mean score and mean measure values are used to determine the green skill elements that need to be applied by ADTEC JTM instructors among students. The mean score value is a logit value where referring to Hasan (2012) the larger the logit value, the more respondents agree with the items. If the digit value is smaller, it indicates that the items are increasingly difficult for respondents to agree with. Table 7 shows the overall mean score and mean measure for all respondents. The mean score value is 1491.1/325 = 4.59, which is at a high level. This means that ADTEC JTM instructors give feedback that they agree at a high level with the green skill elements that need to be applied among students. Based on Bond & Fox (2015), a positive logit value for a respondent indicates that the individual is capable of answering difficult questionnaire items, while a negative logit value indicates that the respondent shows low ability in answering the item.

Table 7
Respondent's level of agreement

Respondent	Agreement		
	Mean score	Mean Size (Logit)	Level
ADTEC JTM Instructor (325 of respondent)	4.59	0.00	High

The results of the analysis found that the mean score for personal effectiveness competency was 1505.9/325 = 4.63 which is at a high level as in Table 8 below. Based on the mean score for academic competency which is 1494.0/325 = 4.58 while the mean score for workplace competency is 1482.6/325 = 4.56. Both competencies also show a high level as in the same table. This shows that ADTEC JTM instructors have given feedback as respondents to this study that the elements of green skills in the construct of personal effectiveness, academic construct and workplace construct need to be applied among students.

Table 8
Summary of Agreement Level By Construct

No.	Construct	Mean Score	Standard Deviation	Mean Size (Logit)	Level of Agreement
1.	Personal Effectiveness	4.63	14.6	-0.35	High

2.	Academic	4.58	25.5	-0.09	High
3.	Workplace	4.56	14.5	0.21	High

3.1 Personal Effectiveness Construct

Based on data analysis carried out using Winsteps software, it was found that the level of suitability of the green skills elements that need to be applied by ADTEC JTM instructors for the five elements under the Personal Effectiveness competency as in Table 9 is at a high level. The highest level of suitability is Integrity with the highest mean score reading of 4.68, followed by Readiness to Learn which is 4.66, Interpersonal skills which is 4.62, Professionalism skills which is 4.59 and Lifelong Learning which is 4.58.

Table 9
Summary of Agreement Level By Personal Effectiveness Construct

Num	Element	Mean Score	Standard Deviation	Mean Size (Logit)	Level of Agreement
1.	Integrity	4.68	6.3	-0.75	High
2.	Willingness to learn	4.66	5.1	-0.56	High
3.	Interpersonal skills	4.62	9.9	-0.21	High
4.	Profesionalisme	4.59	4.6	0.01	High
5.	Long life learning	4.58	5.2	0.15	High

Based on Table 10 shows that through the questionnaire where there are 26 items representing items under Personal Effectiveness Competence. The analysis results found that the highest mean score value for item AB07 is 1527/325 = 4.70 which is at a high level. For the lowest mean score value in the same table representing item AG06 is 1478/325 = 4.55 but still at a high level.

Table 10
Summary of Agreement Level By Personal Effectiveness Sub Element

No.	Element	Mean Score	Mean Size (Logit)	Level of Agreement
1.	AB07	4.70	-0.90	High
2.	AB04	4.70	-0.90	High
3.	AB03	4.69	-0.85	High
4.	AB02	4.69	-0.85	High
5.	AB01	4.68	-0.74	High
6.	AF01	4.68	-0.71	High
7.	AF03	4.67	-0.66	High
8.	AA05	4.67	-0.63	High
9.	AF05	4.66	-0.61	High
10.	AB06	4.66	-0.61	High
11.	AF06	4.66	-0.55	High
12.	AF04	4.66	-0.53	High
13.	AB05	4.64	-0.42	High

14.	AA03	4.64	-0.37	High
15.	AF02	4.63	-0.30	High
16.	AC05	4.60	-0.14	High
17.	AA02	4.60	-0.05	High
18.	AA01	4.60	-0.05	High
19.	AG05	4.59	-0.02	High
20.	AA04	4.59	0.03	High
21.	AG04	4.58	0.05	High
22.	AG03	4.58	0.05	High
23.	AC02	4.58	0.05	High
24.	AG01	4.58	0.07	High
25.	AC01	4.58	0.12	High
26.	AG06	4.55	0.33	High

3.2 Academic Construct

Based on data analysis using Winsteps software, it was found that the level of suitability of the green skills elements that need to be applied by ADTEC JTM instructors for the six elements under Academic Competencies as in Table 11 is at a high level. The highest mean reading score is reading and writing skills which is 4.66, followed by Mathematics Skills which is 4.65, Basic Computer Skills which is 4.63, Engineering and Technology Skills which is 4.62, Critical and analytical thinking which is 4.53 and Science Skills which is 4.45.

Table 11
Summary of Agreement Level By Academic Construct

No.	Element	Mean Score	Standard Deviation	Mean Size (Logit)	Level of Agreement
1.	Reading and writing	4.66	3.3	-0.54	High
2.	Mathematics	4.65	2.4	-0.54	High
3.	Computer basic	4.63	13.2	-0.31	High
4.	Engineering and Technology	4.62	8.3	-0.24	High
5.	Critical and analytical thinking	4.53	9.9	0.47	High
6.	Science	4.45	27.8	0.91	High

Based on Table 12 shows that through the questionnaire where there are 27 items representing items under Academic Competence. The analysis results found that the highest mean score value for item BA05 is 1518/325 = 4.67 which is at a high level. For the lowest mean score value in the same table representing item BC05 is 1416/325 = 4.36 but still at a high level.

Table 12
Summary of Agreement Level By Academic Sub Element

No.	Element	Mean Score	Mean Size (Logit)	Level of Agreement
1.	BA05	4.67	-0.90	High
2.	BF01	4.67	-0.66	High

3.	BA03	4.66	-0.63	High
4.	BB03	4.66	-0.61	High
5.	BAP2	4.66	-0.58	High
6.	BD03	4.66	-0.58	High
7.	BB02	4.65	-0.55	High
8.	BA04	4.65	-0.50	High
9.	BD02	4.65	-0.50	High
10.	BA02	4.65	-0.48	High
11.	BD04	4.64	-0.45	High
12.	BD01	4.64	-0.42	High
13.	BB01	4.64	-0.42	High
14.	BAP1	4.64	-0.42	High
15.	BF03	4.62	-0.42	High
16.	BF04	4.61	-0.27	High
17.	BF05	4.60	-0.12	High
18.	BF02	4.59	-0.0	High
19.	BG04	4.57	0.17	High
20.	BC03	4.56	0.21	High
21.	BG05	4.55	0.28	High
22.	BDP1	4.55	0.33	High
23.	BG03	4.52	0.52	High
24.	BG02	4.50	0.65	High
25.	BG01	4.49	0.73	High
26.	BC01	4.43	1.09	High
27.	BC05	4.02	1.43	High

3.3 Workplace Construct

Based on the analysis of Workplace Competence data, it was found that the level of suitability of the green skills elements that need to be applied by ADTEC JTM instructors for the 11 elements as in Table 13 is at a high level. The highest mean score reading is teamwork skills and skills in using equipment and technology which is 4.61, followed by skills in following instructions which is 4.60, planning and scheduling skills which is 4.59, problem-solving and decision-making skills which is 4.58, planning and operating skills as well as self-adaptation and flexibility which is 4.55, checking, reviewing and recording skills which is 4.53, marketing skills and customer focus as well as business fundamentals which is 4.52 and sustainability skills which is 4.51.

Table 13
Summary of Agreement Level By Workplace Construct

Num	Element	Mean Score	Standard Deviation	Mean Size (Logit)	Level of Agreement
1.	Teamwork	4.61	15.8	-0.15	High
2.	Equipment and technology skills	4.61	6.9	-0.18	High
3.	Following Instructions	4.60	4.3	-0.08	High
4.	Planning and scheduling skills	4.59	7.4	0.02	High

5.	Problem solving and decision making skills	4.58	1.4	0.07	High
6.	Planning and operations skills	4.55	5.9	0.33	High
7.	Adaptibility and flekxibility	4.55	10.1	0.29	High
8.	Inspecting, reviewing and recording skills	4.53	3.3	0.45	High
9.	Entrepreneurship skills	4.52	12.2	0.50	High
10.	Marketing and focus customer skills	4.52	3.2	0.50	High
11.	Sustainability skills	4.51	7.5	0.60	High

Based on Table 14 shows that through the questionnaire where there are 55 items representing items under Workplace Competence. The analysis results found that the highest mean score value for item CA01 is 1512/325 = 4.65 which is at a high level. For the lowest mean score value in the same table representing item CL01 is 1454/325 = 4.47 but still at a high level.

Table 14
Summary of Agreement Level By Workplace Sub Element

No.	Element	Mean Score	Mean Size (Logit)	Level of Agreement
1.	CA01	4.65	-0.50	High
2.	CA02	4.65	-0.45	High
3.	CF01	4.64	-0.37	High
4.	CF03	4.63	-0.30	High
5.	CF02	4.62	-0.27	High
6.	CC03	4.62	-0.22	High
7.	CA03	4.62	-0.22	High
8.	CB01	4.62	-0.19	High
9.	CB05	4.61	-0.17	High
10.	CB06	4.61	-0.14	High
11.	CA04	4.61	-0.14	High
12.	CC02	4.61	-0.12	High
13.	CB04	4.60	-0.10	High
14.	CC01	4.60	-0.05	High
15.	CFP2	4.59	-0.02	High
16.	CB02	4.59	0.00	High
17.	CC05	4.59	0.03	High
18.	CH02	4.58	0.05	High
19.	CH01	4.58	0.05	High
20.	CE01	4.58	0.05	High
21.	CFP1	4.58	0.07	High
22.	CB03	4.58	0.10	High
23.	CH03	4.58	0.12	High
24.	CEP1	4.58	0.12	High
25.	CC06	4.58	0.12	High
26.	CL07	4.57	0.17	High
27.	CD01	4.57	0.17	High

28.	CE02	4.56	0.26	High
29.	CD03	4.55	0.28	High
30.	CE04	4.55	0.31	High
31.	CD02	4.55	0.31	High
32.	CD04	4.55	0.33	High
33.	CC07	4.55	0.33	High
34.	CL05	4.54	0.35	High
35.	CK05	4.54	0.35	High
36.	CI02	4.54	0.37	High
37.	CI06	4.54	0.40	High
38.	CI05	4.54	0.42	High
39.	CG02	4.54	0.42	High
40.	CI01	4.53	0.46	High
41.	CG01	4.53	0.46	High
42.	CK03	4.53	0.48	High
43.	CI03	4.53	0.48	High
44.	CK04	4.52	0.52	High
45.	CG04	4.52	0.55	High
46.	CAP1	4.52	0.55	High
47.	CD05	4.51	0.57	High
48.	CI04	4.51	0.59	High
49.	CG03	4.51	0.59	High
50.	CL02	4.50	0.67	High
52.	CE03	4.50	0.69	High
52.	CK06	4.49	0.71	High
53.	CK02	4.49	0.73	High
54.	CK01	4.49	0.79	High
55.	CL01	4.47	0.82	High

4.0 DISCUSSION AND CONCLUSIONS

Based on the analysis of the green skills elements in the constructs of Personal Effectiveness Competence, Academic Competence and Workplace Competence, it was found that Personal Effectiveness Competence is very important to be implemented in the student curriculum followed by Academic Competence and Workplace Competence. For Personal Effectiveness Competence which consists of five green skill elements, it was found that Integrity skills are the most important green skills to be implemented in the student curriculum followed by willingness to learn, interpersonal skills, professionalism skills and lifelong learning. Sub-elements under the integrity element such as not being easily influenced, sincerity, trustworthiness, efficiency and cleanliness are among the very important skills to be implemented in the student curriculum.

Under Academic Competencies which consist of six elements of green skills, it was found that reading and writing skills are the most important to be implemented in the student curriculum followed by Mathematical Skills, Basic Computer Skills, Engineering and Technology skills, critical and analytical thinking and Science skills. Sub-elements such as the skills to develop ideas through supporting information, the skills to identify the latest equipment that is suitable for the job, convey information in an orderly manner, take measurements correctly, understand safety symbols in the workplace, know how to use basic computer applications and so on are among the important skills that need to be implemented in the student curriculum.

For the skills under Workplace Competencies which consist of eleven elements of green skills, it was found that the highest skills that need to be applied are teamwork skills followed by skills in using equipment & technology, following instructions, planning and scheduling skills, problem solving and decision making skills, planning and operating skills, adaptability and flexibility skills, checking, reviewing and recording skills, basic business skills, marketing skills and customer focus and sustainability practices. For the sub-elements of skills that need to be applied in the student curriculum are the skills to communicate effectively with others, work effectively with others, select equipment, technology and machinery that is suitable for the job, identify equipment operations according to established work safety procedures and so on.

The results of this study are expected to determine the elements of green skills that need to be incorporated by institutes into the current student curriculum to prepare graduates to compete in the job market. This is because Technical and Vocational Education Institutions (TVET) such as the ADTEC JTM need to play an important role in fostering green skills. This is stated by UNESCO (2012) that green TVET institutions play a role in helping skilled workers towards sustainable development in line with the technical knowledge needed by workers. Therefore, green skills are seen as a new skill that is needed by employers today through preliminary studies conducted with employers in the industry. Green skills play an important role in improving the quality of work, Strietska-Ilina et al. (2011). When green economic growth occurs, the demand for high-skilled workers will increase and the qualifications of labor in new technologies will also be upgraded.

Overall, green skills are very important among students, especially TVET institutions including ADTEC JTM students. M.Said et al., (2015) stated that TVET stream students need to master new skills based on sustainability involving the economy, society and the environment. . In addition students will able to compete in the industrial market. The ADTEC JTM which is one of the Technical and Vocational Education Institutions (TVET) needs to play an important role in implementing green technology skills in the student learning curriculum. Green skills are the skills of the future and for their implementation in the country requires comprehensive cooperation between the local government and the industry sector. ILJTM needs to ensure that the graduates produced are relevant to the needs of the industry. UNESCO (2012) stated that TVET institutions play a role in helping skilled workers towards sustainable development and this is also in line with the knowledge and technical skills needed by workers.

REFERENCES (APA Style**)**

Bond, T. G., & Fox, C. M. (2015). Applying the Rasch Model. In *Applying the Rasch Model : Fundamental Measurement In The Human Sciences* (Third Edit). https://doi.org/10.4324/9781410614575

CEDEFOP. (2012). *Green skills and environmental awareness in vocational education and training* (Issue 24).

CEDEFOP. (2014). Greener Skills and Jobs. In *OECD Green Growth Studies*. https://doi.org/10.1787/9789264208704-en

Dieter Mertineit, K. (2013). *TVET For A Green Economy*.

EcoCanada. (2010). *Defining the Green Economy*.

Employment, M. C. for T. E. and. (2011). *Green Skills Agreement Implementation Plan 2010-2011* (Issue May 2010).

Hasan, A. (2012). *Instrumen Penilaian Pembimbing Dalam Pelaksanaan Pembelajaran Berasaskan Kerja Pelajar Di Industri*. Universiti Teknologi Malaysia.

ILO. (2011). *Skills For Green Jobs A Global View Jobs A Global View*.

Krejcie, R.V. and Morgan, D.W. (1970) Determining Sample Size for Research Activities. Educational and Psychological Measurement, 30, 607-610

M.Said, S., Monzaid, E., & Hasan, A. (2015). Pembangunan model kompetensi kemahiran hijau ke arah peningkatan kompetensi pensyarah politeknik di malaysia (. *Journal of Global Business and Social Entrepreneurship (GBSE)*, *1*(2), 109–117.

Malaysia, J. P. (2017). *Pelan Transformasi Nasional 2050.pdf*.

McMillan, J. H., & Schumacher, S. (1984). *Research in Education: A Conceptual Introduction*. Little, Brown.

OECD. (2012). *Supplemental Material for Chapter 4 of the 2012 Oecd Employment Outlook (" What Green Growth Means for Workers and Labour Markets : an Initial Assessment "): Summary of Country Responses To the Oecd Questionnaire on Green Jobs*.

Sern, L. C., Zaime, A. F., & Foong, L. M. (2017). Green Skills for Green Industry : A Review of Literature Green Skills for Green Industry. *1st International Conference on Green and Sustainable Computing (ICoGeS) 2017*.

Strietska-Ilina, O., Hofmann, C., Durán Haro, M., & Jeon, S. (2011). Skills for Green Jobs: A global view. In *International Labour Organization*. http://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_159585.pdf

Sumintono, B., & Widhiarso, W. (2013). *Aplikasi Model Rasch untuk Penelitian Ilmu-ilmu Sosial*. TrimKom Publishing House.

UNESCO. (2012). *Promoting Skills For Sustainable Development*.

Yapin, H., Suhadi, H., & Esa, A. (2017). Implementation Of Green Skills Through The Co-Curriculum Activities Among Students Technical And Vocational Education Training (TVET) Towards Development Of Green Industry. *Elixir Soc. Sci. 107 (2017) 47295-47297 Available*, *107*, 47295–47297.