



The Quality Measurement of Information System of Skill Competence Test Assessment at Islamic Vocational High School Pemalang by Using McCall Method

Sandi Novyan Indarta^{1✉}, Noor Hudallah², Muhammad Khumaedi²

¹Islamic Vocational High school Pemalang, Pemalang, Central Java, Indonesia

²Pascasarjana, Universitas Negeri Semarang, Indonesia

Article Info

Article History :
Received September 2020
Accepted November 2020
Published July 2021

Keywords:
Information system of
UKK assessment,
SIMUKK

Abstract

The measurement of information system of UKK assessment at Islamic Vocational High School Pemalang was done to measure the quality of the implementation of UKK assessment information system based on the user's perception by using McCall method. The process of UKK assessment information system measurement at Islamic Vocational High School Pemalang was done with some stages of measurement by using some quality factors in McCall method, they are: correctness, usability, integrity, reliability, and efficiency to know how good the quality is and the quality of utilization of UKK assessment information system user. The measurement process was using 66 users where the result of this application was 78,6% and it was considered in a good category. However, further development was needed to improve the utilization of user and also to get better quality of UKK assessment information system.

✉ Correspondence :
Jl. Letjand Di Panjaitan No.KM 3, Paduraksa, Kec. Pemalang,
Kabupaten Pemalang, Jawa Tengah, Indonesia 52319
E-mail: sandi.novyan@gmail.com

INTRODUCTION

Assessment is an evaluation that includes all methods used to know the successful of students' learning by assessing students' work individually or in group. One of the forms of assessment at vocational high school is Skill Competence test (UKK).

Suharsimi Arikunto (2016: h.3), by holding the assessment in education, students could know how far they successfully follow the lesson given by teachers through students' learning. The implementation of skill competence test assessment (UKK) at Islamic Vocational High School Pemalang is conducted manually using the examiner from DuDi and examiner from teachers would give score and wrote it in a piece of assessment instrument paper, then both of those assessment instruments would be combined and counted to make final score for the student that was printed in the skill competence certificate.

METHODS

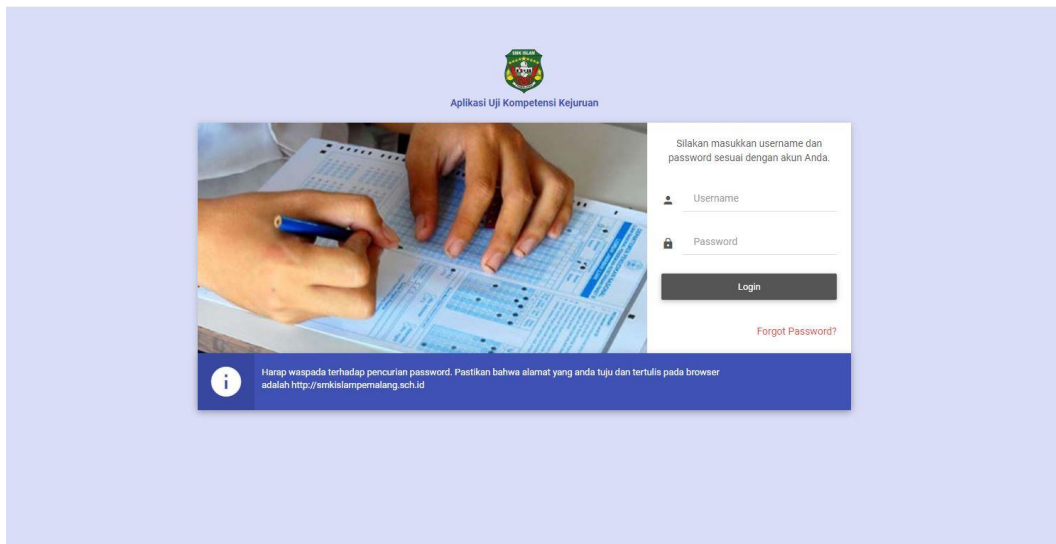
The research method used in this study was research and development. Research and development is a research method that is used to

produce certain product, and to test the effectiveness of certain product (sugiyono, 2016: h.407).

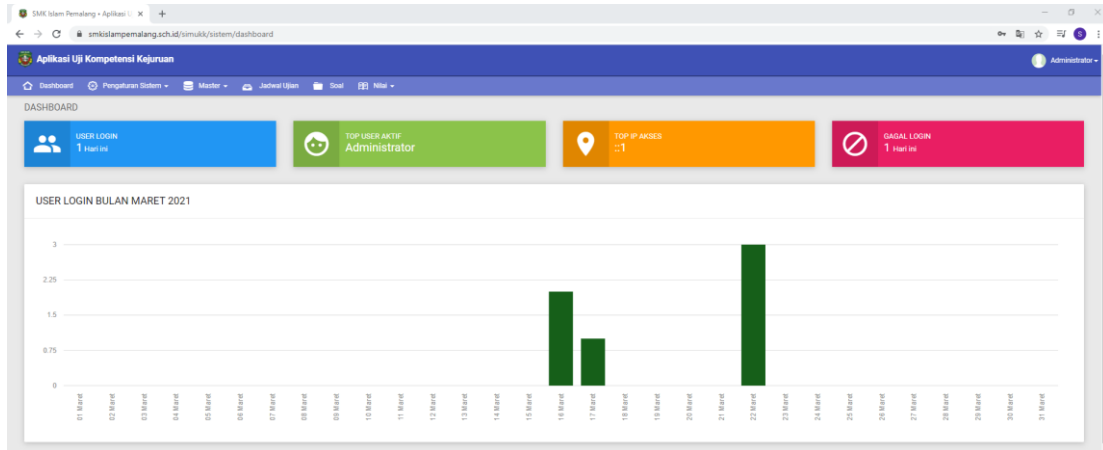
In the development research that was done by the researcher, refers to the step of development according to Borg & Gall. From the 10 steps according to Borg and Gall (1983: h.775) would be limited by the researcher to be adapted with the need of researcher and the development that would be done. The development of skill competence test information system refers to waterfall development model explained by Ian Sommerville (2011: h.30) because it was suitable for the need of the researcher. The procedure of research and development used waterfall development, which included requirements definition, system and software design, implementation and unit testing, integration and system testing, and operation and maintenance. After the product was finished, then the information system was tested by using information system quality measurement with McCall method.

RESULT AND DISCUSSION

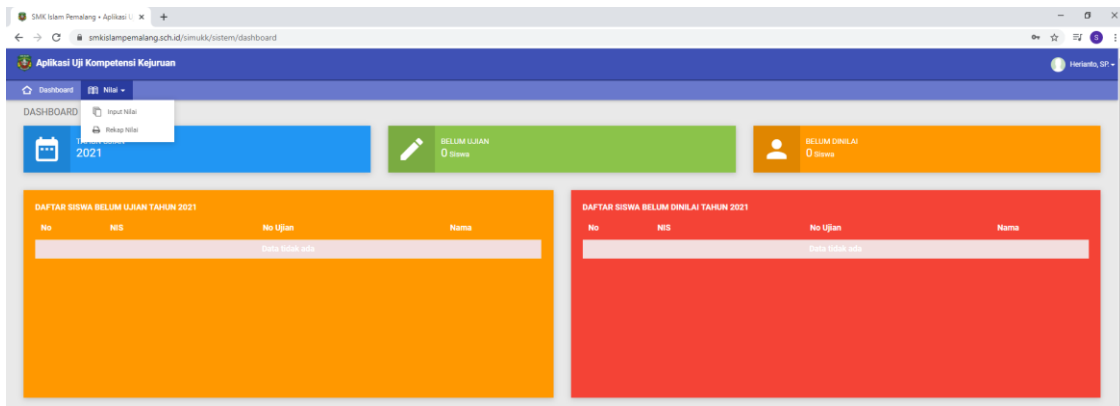
The appearance of UKK assessment information system at Islamic Vocational High School Pemalang could be seen in the picture 1 below.



Picture 1. The appearance of Skill Competence Test Information System



Picture 2. The timeline appearance for Administrator



Picture 3. The timeline appearance for examiner

No	Kompetensi Sub/Kompetensi	Nilai
1	Periapan	
1.1	Melakukan survei lokasi	<input type="radio"/> belum <input type="radio"/> cukup <input checked="" type="radio"/> baik <input type="radio"/> sangat baik
1.2	Membuat daftar kebutuhan lokasi pengguna jaringan	<input type="radio"/> belum <input type="radio"/> cukup <input checked="" type="radio"/> baik <input type="radio"/> sangat baik
1.3	Mempersiapkan peralatan dan bahan yang diperlukan	<input type="radio"/> belum <input type="radio"/> cukup <input type="radio"/> baik <input checked="" type="radio"/> sangat baik
1.4	Memasang konektor pada kabel jaringan	<input type="radio"/> belum <input type="radio"/> cukup <input checked="" type="radio"/> baik <input type="radio"/> sangat baik
1.5	Mengijl koneksi kabel	<input type="radio"/> belum <input type="radio"/> cukup <input checked="" type="radio"/> baik <input type="radio"/> sangat baik
1.6	Merencanakan pengabelan horizontal	<input type="radio"/> belum <input type="radio"/> cukup <input type="radio"/> baik <input checked="" type="radio"/> sangat baik
1.7	Menginstalasi pengabelan horizontal	<input type="radio"/> belum <input type="radio"/> cukup <input type="radio"/> baik <input checked="" type="radio"/> sangat baik
1.8	Mempersiapkan peralatan dan bahan/materi yang diperlukan	<input type="radio"/> belum <input type="radio"/> cukup <input type="radio"/> baik <input checked="" type="radio"/> sangat baik

Picture 4. The appearance of score input process in the examiner

Urut	Nomor		Nama Siswa	L/P	Hari dan Tanggal Ujian
	NIS	No Ujian			
1	6007	03-34-0202-0188	AFRI HILAL FUJI	L	Senin, 08 Maret 2021 07:30-16:00
2	6008	03-34-0202-0189	AJENG ARDANA ZALIYANTI	P	Senin, 08 Maret 2021 07:30-16:00
3	6009	03-34-0202-0190	ANANDA JUMIATUN	P	Senin, 08 Maret 2021 07:30-16:00
4	6010	03-34-0202-0191	APRIJA MUN ADINDA	P	Senin, 08 Maret 2021 07:30-16:00
5	6011	03-34-0202-0192	ARDI	L	Senin, 08 Maret 2021 07:30-16:00
6	6012	03-34-0202-0193	ARFAN NUR HIDAYATULLAH	L	Senin, 08 Maret 2021 07:30-16:00
7	6014	03-34-0202-0194	ARYATI	P	Senin, 08 Maret 2021 07:30-16:00
8	6015	03-34-0202-0195	ASTRID KUSUMA NINGRUM	P	Senin, 08 Maret 2021 07:30-16:00
9	6016	03-34-0202-0196	AZZAHRA NUR UFAMAH ARFA	P	Senin, 08 Maret 2021 07:30-16:00
10	6017	03-34-0202-0197	CINDI EKA DIAH AYU MARSELLA	P	Selasa, 09 Maret 2021 07:00-16:00
11	6018	03-34-0202-0198	DANI ADI SETIAWAN	L	Selasa, 09 Maret 2021 07:00-16:00
12	6019	03-34-0202-0199	DEDE VINDIRIA	P	Selasa, 09 Maret 2021 07:00-16:00
13	6021	03-34-0202-0200	DELYANA KUSHERAWATI	P	Selasa, 09 Maret 2021 07:00-16:00
14	6022	03-34-0202-0201	DELYANI KUSHERAWATI	P	Selasa, 09 Maret 2021 07:00-16:00
15	6023	03-34-0202-0202	DEWI SINTA	P	Selasa, 09 Maret 2021 07:00-16:00
16	6024	03-34-0202-0203	DIAH AYU LARASATI	P	Selasa, 09 Maret 2021 07:00-16:00

Picture 5. Students' timeline appearance

No	Hasil	Score
3.1	Membuat daftar teknologi yang dapat memperbaiki kinerja jaringan	
3.2	Menguji perangkat	
3.3	Mendokumentasikan pengamatan jaringan	
3.4	Menguji switch pada jaringan	
3.5	Menyediakan dukungan untuk produk-produk yang dimatikan	
3.6	Menguji routing pada perangkat jaringan	
3.7	Mendokumentasikan konfigurasi routing	
3.8	Mengembangkan Service Level Agreement (Perjanjian Tingkat Layanan) atau SLA	
3.9	Mendokumentasi konfigurasi yang sedang beroperasi	
3.10	Menganti peralatan sesuai dengan konfigurasi sebelumnya	
Nilai Keterampilan (70%)		61.71
Nilai Pengetahuan (30%)		22.5
Nilai Akhir (Nilai Keterampilan + Nilai Pengetahuan)		84.21

Nilai	Kategori
< 61	Tidak Kompeten
61 - 70	Cukup Kompeten
71 - 80	Kompeten
81 - 90	Sangat Kompeten
91 - 100	IsImewa

Picture 6. Students' score appearance

**KELOMPOK BIDANG KEAHLIAN
TEKNIK KOMPUTER DAN JARINGAN**
Alamat : Jl Urip Sumartono No. 101 Pekalongan, Pemalang, Phone (0254) 5805491
No. : 34.202.C.2863.023

**SERTIFIKAT KOMPETENSI
CERTIFICATE COMPETENCY**
Nomor : 010 103 27 SMK Ia E2/2021

Sertifikasi diselenggarakan berdasarkan Peraturan Menteri Pendidikan dan Kebudayaan Nomor 3 Tahun 2017 tentang Ujian Nasional tahun Pelajaran 2020/2021 dan Keputusan Badan Standar Nasional Pendidikan (BSNP) Nomor 044/P/BSNP/2017 tentang Prosedur Operasi Standar Penyelenggaraan Ujian Nasional Tahun Pelajaran 2020/2021.

Sertifikat ini menyatakan bahwa:
AFRI HILAL FUJI
Lahir di PEMALANG, 26 Juni 2002
Sekolah Asal : SMK Islam Pemalang

Lulus Uji Kompetensi Keahlian Kejuruan dan diakui telah memiliki kompetensi seperti tercantum di balik sertifikat ini.

Kepada SMK Islam Pemalang Pemalang, 19 Oktober 2021
Ketua Asosiasi Profesi/Industri Mitra/Pasangan

Drs. H Wiyosi Herianto, SP.

**PROGRAM KEAHLIAN TEKNIK KOMPUTER DAN JARINGAN
KOMPETENSI B KOMPETENSI YANG DIJUKAN**

No	Kompetensi yang Diukur	Nilai
1	1.1 Menganalisis kebutuhan jaringan	
1	1.2 Menganalisis kebutuhan jaringan	
1	1.3 Menganalisis kebutuhan jaringan	
1	1.4 Menganalisis kebutuhan jaringan	
1	1.5 Menganalisis kebutuhan jaringan	
1	1.6 Menganalisis kebutuhan jaringan	
1	1.7 Menganalisis kebutuhan jaringan	
1	1.8 Menganalisis kebutuhan jaringan	
1	1.9 Menganalisis kebutuhan jaringan	
1	1.10 Menganalisis kebutuhan jaringan	

Picture 7. UKK certificate print view

In this study, the instrument used was questionnaire. This technic was useful to give answer and opinion from the users of system during the use of UKK assessment information system at Islamic Vocational High School Pematang. To determine the quality of software or score from UKK assessment information system, the questionnaire instrument used was likert scale. Before the instrument was used by the users of the information system, it had been validated by the experts and had been considered as a good instrument to be used in the research.

In the questionnaire used to determine the quality of software or the properness of UKK assessment information system was given by the users based on the quality factor criteria that mentioned in the McCall method, they are: correctness, usability, integrity, reliability, and efficiency. Measurement used likert scale would be given certain score or quality in each answer of question. This research used likert scale with the score from 1 to 5. The determine questionnaire measurement scale could be seen in the table 1 below.

Table 1. Likert Scale

Category	Score
Excellent	5
Good	4
Good enough	3
Not good	2
Worse	1

After the scale was determined, the instrument was made

After the scale was determined, the question instrument was made based on the McCall theory. The data analysis was done quantitatively by using measurement technic of formula below:

$$Fa = w1c1 + w2c2 + w3 c3 +.....+ wn cn$$

... (1)

According to Richardus Eko Indrajit, where :

- Fa = quality software factor
- w1 = quality that depends on the product and concern
- c1 = metric that affect quality software factor

The measurement system used the steps as below.

1. Determine the criteria that used to measure certain factor.

2. Determine the quality (w) of each criteria (0,1<= w <=0,4), based on the importance of the leader of university towards the system where:

- 0,1 = highly unimportant
- 0,2 = unimportant
- 0,3 = important
- 0,4 = highly important

3. Determine the scale of criteria, where the assessment scale used was among 1 – 5, with certain condition which was mentioned in the table 1.

4. Put in the score in each criteria
5. Counting the total score with the formula below:

$$Fa = w1c1 + w2c2 +....+wncn$$

Fa is the total score from factor a, w1 is the quality for criteria 1, and c1 is the score for criteria 1

6. Then factor quality score was changed in the form of percentage (%). The amount of percentage was counted by using the equality below:

$$Percentage = \frac{\text{obtained score}}{\text{maximum score}} \times 100 \%$$

... (2)

The percentage result was used to give answer for the properness of inspected aspects. The classification of quality category according to Arikunto (2009: 44), there are five scales, these sales pay attention to the range of percentage number. The maximum score expected to be 100 % and the minimum to be 0 %. The classification of range of quality category could be seen in the table 2.

Table 2. properness category

Category	Score(%)
Excellent	81 - 100
Good	61 - 80
Good enough	41 - 60
Not good	21 - 40
Worse	< 20

Source : Suharsimi Arikunto (2009: h.15)

Table 3. The result of information system quality test

No	Indicator	Description	Quality	Criteria score
		a. Completeness		
		1. This application could already done the data cultivation process (input, edit, save, delete)	0,4	4,1
		2. All the features which exist in the information system were already functioned well.	0,4	4,2
		b. Consistency		
1	Correctness 0,3	3. Same features and design in each page	0,2	4,2
		4. Same button and form design feature in each page	0,2	4,2
		5. Same data management in each form	0,2	4,3
		6. Consistent language used in each page	0,3	4,2
		c. Treaceability		
		7. Users could track the time (date and hour) in data management	0,2	4,2
		d. Communicative		
		8. Understandable language	0,4	4,1
		9. Readable writing in each page	0,4	3,9
		10. Clear function of each button in each page	0,3	4,1
2	Usability 0,2	e. Operability		
		11. Easy use of menu and button in the information system	0,4	3,8
		12. Users easily understand about the coding system	0,4	3,8
		f. Training		
		13. New users could easily use the UKK information system	0,4	4,1
		g. Security		
3	Integrity 0,3	14. The log in process could run well exactly like the user expected	0,3	4,2
		15. This application could control users' access by limiting the access rights	0,4	4,2
		h. Accuracy		
4	Reliability 0,2	16. The application easily put in data needed by the system	0,4	4,1
		17. This application properly give data and information based on users need	0,4	4,2
		18. Information from this application was accurate and free from mistakes	0,4	4,2

	19. Users could get information needed quickly	0,3	4,3
	20. Output from the system was presented in the correct form to make it easier to understand by the users	0,3	4,1
	i. Error Tolerancy		
	21. What if the access to the information application system and data could not be used by those who do not have the rights to use it	0,4	4,2
	j. Simplicity		
	Understandable information in the information system	0,4	4,2
	Understandable menu in the information system without any difficulties	0,4	4,1
5	k. Execution Efficiency		
	Do the function service menu and the data already fulfil the need?	0,3	4,1
Efficiency 0,2	The adequate rule was used to operate the ukk assessment information system	0,3	4,2
	The function of contents inside the ukk assessment information system had already accommodate the delivery from school	0,4	4,0

The last step after determine the quality and criteria score determining the total score of Fa based on quality factor in the McCall.

The following formula was used in the McCall technic:

$$Fa = w1c1 + w2c2 + \dots + wncn \dots\dots\dots(2)$$

where :

- Fa : the total score of factor a
- w : the quality based on the product and interest
- c : metric that affect quality software factor (average score)

The calculation of each factor was done based on certain criteria as below::

a. Correctness

$$\begin{aligned} \text{Completeness} &= (w1c1+w2c2) \\ &= (0,4 \times 4,1) + (0,4 \times 4,2) \\ &= 1,64 + 1,68 \\ &= 3,32 \end{aligned}$$

$$\begin{aligned} \text{Consistency} &= (w3c3+w4c4+w5c5+w6c6) \\ &= (0,2 \times 4,2) + (0,2 \times 4,2) + (0,2 \times 4,3) \\ &+ (0,3 \times 4,2) \\ &= 0,84 + 0,84 + 0,86 + 1,26 \\ &= 3,8 \end{aligned}$$

$$\begin{aligned} \text{Treacebility} &= (w7c7) \\ &= (0,2 \times 4,2) = 0,84 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form with the equality formula as below:

So the score of Fa1 was calculated as below:

$$\begin{aligned} Fa1 &= \frac{\text{Completeness} + \text{Consistency} + \text{Treacebility}}{3} \\ &= \frac{3,32+3,8+0,84}{3} \\ &= 2.65 \end{aligned}$$

From the result obtained, then factor quality score was changed into percentage form by using the equality as below:

$$\begin{aligned} \text{Percentage} &= \frac{\text{obtained score}}{\text{Maksimum score}} \times 100\% \\ &= \frac{2,65}{5} \times 100\% \\ &= 53 \% \end{aligned}$$

b. Usability

$$\begin{aligned} \text{Communicativeness} &= (w1c1 + w2c2 + w3c3) \\ &= (0,4 \times 4,1) + (0,4 \times 3,9) \\ &+ (0,3 \times 4,1) \\ &= 1,64 + 1,56 + 1,23 \\ &= 4,43 \end{aligned}$$

$$\begin{aligned} \text{Operability} &= (w4c4+w5c5) \\ &= (0,4 \times 3,8) + (0,4 \times 3,8) \\ &= 1,52 + 1,52 \\ &= 3,04 \end{aligned}$$

$$\begin{aligned} \text{Training} &= (w6c6) \\ &= (0,4 \times 4,1) = 1,64 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality formula as below:

So the score of Fa2 was calculated as below:

$$\begin{aligned} \text{Fa2} &= \frac{\text{Communicativeness} + \text{Operability} + \text{Training}}{3} \\ &= \frac{4,43 + 3,04 + 1,64}{3} \\ &= 3,04 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality as below:

$$\begin{aligned} \text{Percentage} &= \frac{\text{obtained score}}{\text{Maksimum score}} \times 100\% \\ &= \frac{3,04}{5} \times 100\% \\ &= 61\% \end{aligned}$$

c. Integrity

$$\begin{aligned} \text{Security Fa3} &= (w1c1 + w2c2) \\ &= (0,3 \times 4,2) + (0,4 \times 4,2) \\ &= 1,26 + 1,68 \\ &= 2,94 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality as below:

$$\begin{aligned} \text{Percentage} &= \frac{\text{obtained score}}{\text{Maksimum score}} \times 100\% \\ &= \frac{2,94}{5} \times 100\% \\ &= 59\% \end{aligned}$$

d. Reliability

$$\begin{aligned} \text{Accuracy} &= \\ &= (w1c1 + w2c2 + w3c3 + w4c4 + w5c5) \\ &= (0,4 \times 4,1) + (0,4 \times 4,2) + (0,4 \times 4,2) \\ &+ (0,3 \times 4,3) + (0,3 \times 4,1) \\ &= 1,64 + 1,68 + 1,68 + 1,29 + 1,23 \\ &= 7,52 \end{aligned}$$

$$\begin{aligned} \text{Error Tolerancy} &= (w6c6) \\ &= (0,4 \times 4,2) = 1,68 \end{aligned}$$

$$\begin{aligned} \text{Simplicity} &= (w7c7 + w8c8) \\ &= (0,4 \times 4,2) + (0,4 \times 4,1) \\ &= 1,68 + 1,64 \\ &= 3,32 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality as below:

So the score of Fa4 was calculated as below:

$$\begin{aligned} \text{Fa4} &= \frac{\text{Accuracy} + \text{Error Tolerancy} + \text{Simplicity}}{3} \\ &= \frac{7,52 + 1,68 + 3,32}{3} = \frac{12,52}{3} \\ &= 4,17 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality as below:

$$\begin{aligned} \text{Percentage} &= \frac{\text{obtained score}}{\text{Maksimum score}} \times 100\% \\ &= \frac{4,17}{5} \times 100\% = 83,4\% \end{aligned}$$

e. Efficiency

Execution Efficiency

$$\begin{aligned} \text{Fa5} &= (w1c1 + w2c2 + w3c3) \\ &= (0,3 \times 4,1) + (0,3 \times 4,2) + (0,4 \times 4,0) \\ &= 1,23 + 1,26 + 1,6 \\ &= 4,09 \end{aligned}$$

Based on the result obtained, then the factor quality score was changed into percentage form by using the equality as below:

$$\begin{aligned} \text{Presentase} &= \frac{\text{obtained score}}{\text{Maksimum score}} \times 100\% \\ &= \frac{4,09}{5} \times 100\% \\ &= 81,8\% \end{aligned}$$

Functionality aspect checklist result obtained from some respondents was calculated as percentage with the equality formula as below:

$$\begin{aligned} \text{Percentage of Functionality} &= \\ &= \frac{\text{result obtained}}{\text{Maksimum score}} \times 100\% \\ &\dots\dots\dots(3) \end{aligned}$$

So that the total of the quality (Σ) obtained was as below:

$$\begin{aligned} \Sigma &= \\ &= \frac{(0,3 \times \text{Fa1}) + (0,2 \times \text{Fa2}) + (0,3 \times \text{Fa3}) + (0,2 \times \text{Fa4}) + (0,2 \times \text{Fa5})}{5} \times 100\% \\ &= \frac{(0,3 \times 2,65) + (0,2 \times 3,04) + (0,3 \times 2,94) + (0,2 \times 4,17) + (0,2 \times 4,09)}{5} \times 100\% \\ &= \frac{(0,79) + (0,61) + (0,88) + (0,83) + (0,82)}{5} \times 100\% \\ &= \frac{3,93}{5} \times 100\% = 78,6\% \end{aligned}$$

The percentage result above then compared with the likert scale, the classification of the level of percentage based on likert scale could be seen in table 3.11. it can be concluded that the skill competence test assessment information system at Islamic Vocational High School Pematang was

78,6% in total and was considered in a good category.

CONCLUSION

This research focuses on the measurement of skill competence test assessment information system at Islamic Vocational High School Pematang, it can be concluded as below;

The result of information system quality assessment according to Mc Call with the Correctness in the amount of 53 % (good enough), Usability in the amount of 61% (good), Integrity in the amount of 59% (good enough), Reliability in the amount of 83,4% (excellent) dan Efficiency in the amount of 81,8% (excellent).

The percentage result above then compared to the likert scale, the classification of the level of percentage based on likert scale can be seen in the table 2. It can be concluded that the skill competence test assessment information system at

Islamic Vocational High School Pematang in total occurred in the level between 61% - 80% = 78,6% and included in good category.

REFERENCES

- Borg, W.R. & Gall, M.D. Gall. (1983). *Educational Research: An Introduction, Fifth Edition*. New York: Longman.
- Indrajit, Richardus, Eko. (2011). *Peranan Teknologi Informasi dan Internet*. Yogyakarta: Andi Offset.
- McCall, J., P. Richards, dan G. Walters, "Factors in software Quality", tiga volume, NTIS AD-A049-014, 015, 055, November 1977
- Sommerville, Ian. (2011). *Software Engineering, Ninth Edition*. Boston: Pearson.
- Sugiyono. 2016. *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Suharsimi Arikunto. (2016). *Prosedur Penelitian, Suatu pendekatan praktik*. Jakarta: Rineka Cipta.