Development of Authentic Psychomotor Instruments for Vocational School in the Covid-19 Pandemic

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Abstract: This research aims to develop psychomotoric instruments adapted to the current conditions of Covid-19. Development research was carried out with reference to the 4D model from Thiagarajan. The research sample used was 39 students of the Ottimmo International MasterGourmet Academy. The research instrument used a validation sheet from validators or experts. Data of the research were obtained based on the results of the validation of the experts, which were then analyzed to determine the validity and reliability of the developed psychomotoric instruments. The findings of study indicated that the results of (1) the validation got an average value of 4.61 with a very valid category; and (2) reliability got a value of 0.671 in the reliable category. The conclusion of the research shows that the developed psychomotoric instrument is suitable for use in service and leverage learning.

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Introduction

WHO (2020) describe that coronavirus is a group of viruses that can cause disease in animals or humans. Several types of coronavirus are known to cause respiratory tract infections in humans ranging from cold coughs to more serious ones such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The newly discovered coronavirus causes the disease Covid-19. Satgas Covid-19 Jatim (2020), through its official website, based on data updates dated August 18, 2020, shows that there are 40,460 patients confirmed to be active for the national level, while for the provincial level there are 4,864 confirmed active patients. Unicef et al., (2020) the protection of student and educational facilities is particularly important. Precautions are necessary to prevent the potential spread of Covid-19 in school settings; however, care must also be taken to avoid stigmatizing students and staff who may have been exposed to the virus. It is important to remember that Covid-19 does not differentiate between borders, ethnicities, disability status, age, or gender. Education settings should continue to be welcoming, respectful, inclusive, and supportive environments to all. Measures taken by schools can prevent the entry and spread of Covid-19 by students and staff who may have been exposed to the virus while minimizing disruption and protecting students and staff from discrimination.

Minister of Education and Culture (2020) issued Circular Letter Number 15 of 2020 concerning Guidelines for Organizing Learning from Home in an Emergency for the Spread

of Covid-19. Learning from Home or Online class makes assessing learning outcome difficult. (Ariyanto et al., 2019a) explained that assessment is one of the techniques used by teachers to measure students' affective, cognitive, and psychomotor abilities. In this case, generally the assessment is carried out at the end of the learning process as an evaluation material for the implementation of learning. Daniel (2020) at this moment pandemic Covid-19 still rages in most parts of the world, these bodies are unable to say when they will resume normal operations and how, if at all, they will provide results for this year's cohort. Institutions versed in distance learning often start the process of course construction by designing the student assessments that will be part of it. This is a way of clarifying learning objectives and content that teachers making a sudden transition to remote operation should consider adopting. It will help them determine the parts of the standard curriculum on which they will focus as well as their aims in including other topics. Muslim (2013) explained that the abilities that students have as a result of learning actions could be observed through student performance. Anderson & Krathwohl (2001) explained that generally learning outcomes are grouped into three aspects/domains, namely cognitive, affective, and psychomotor. In practice, vocational learning is more dominant. Therefore an ideal instrument is needed by the conditions of the Covid-19 pandemic.According to Sudjana (2017). Psychomotor learning outcomes are a type of learning form skills (skills) and the ability to act individually. To find out whether or not the learning objectives of the motorbike were made, an instrument was made.

There are many tools that can be used as a tools of conducting online learning assessments among them is the zoom application. Zoom Help Center (2020) define zoom is a video communications tool with a cloud platform for video and audio conferencing, collaboration, chat and webinars. It can be sed across mobile devices, desktops, laptops, and telephones. Its features like chat, screen share, annotate, whiteboard, polling, breakout rooms, raising the hand, and managing participants lend themselves to creating engaging virtual and hybrid classrooms and collaborating on projects. Users have the option to record sessions.

The learning outcome instrument is a tool for measuring students' abilities after they have received their learning experience. In previous research using offline class made by Muslim (2013) explains that the performance test assessment consists of a procedure reference rating scale and a result reference rating scale. Ahmad et al. (2018) research was conducted to develop a psychomotor assessment instrument to assess the skills of vocational students in carrying out practicum, particularly complexometric titration. The results of this study are high empirical velocity, teacher responses about the practicality of the instruments used are in the practical category so that this instrument can be used. In offline learning, it is definitely different from offline learning, so it is necessary to create a psychomotor learning outcome instrument that is adapted to the conditions of the COVID-19 pandemic.

The objectives of this study include: (1) the validity of developing authentic instruments based on the validation of experts; and (2) Development of authentic instrument reliability based on test results

Research Method

This research is development research that refers to the 4D development model. Ariyanto & Arsana (2016) describes the 4D development model consisting of 4 main stages, namely: Define, Design, Develop, and Disseminate. This study involved 39 ottimmo culinary school students who were taking food and beverage service management courses. The

research instrument is a validation sheet for validators or experts. The test subjects in this study were three expert lecturers. The data obtained in this study are instrument validation data from experts and data reliability data based on the instruments of the trial results. The data obtained by measuring the validity, reliability, accurate and effective instruments developed.

Finding and Discussion

Define Stage

The defining stages are determining and defining the needs in the learning process and collecting various information related to the instruments to be developed starting from: (1) initial analysis in the form of learning problems (Ariyanto et al., 2020); (2) student analysis in the way of students' initial ability Ottimmo Culinary; (3) task analysis in the form of food and beverages service managements competency analysis; (4) concept analysis in the way of juice drink-making; (5) objective analysis in the type of a psychomotor instrument. The instrument in this study is observation, namely the technique of collecting data by observing directly or indirectly about the things observed and taking notes on the observation tool (Surya & Aman, 2016). The assessment of learning outcomes in the psychomotor domain of food and beverages service management subjects was obtained from the observations of students during the practicum using rating scales. which include a procedure reference rating scale and a result reference rating scale.

Design Stage

Activities carried out in the design stage, compiling the concept of service provision, are arranged according to the needs and learning of the production system (Ariyanto & Arsana, 2016). Muslim (2013) explains that the performance test assessment consists of a procedure reference rating scale and a result reference rating scale. Dave's theory in Basuki & Hariyanto (2017) has divided the stages of learning outcomes in the psychomotor domain into five steps, namely: imitation (P1), manipulation (P2), precision (P3), articulation (P4), and naturalization (P5). A summary table of psychomotor learning outcomes based on Dave's theory is shown in Table 1, while the pie chart is shown in Figure 1.

Table 1. Summary of Psychomotor Learning Outcomes

Steps	Indicator Number	Quantity	Percentage
P1	1	1	5%
P2	14	1	5%
P3	2, 3, 5, 6, 7, 10, 18	7	35%
P4	4, 8, 9, 11, 12, 13, 19, 20	8	40%
P5	15, 16, 17	3	15%
Amount		**20**	**100%**

Development Stage

The development stage aims to obtain a psychomotor instrument in the subject of service and leverage that is suitable for use by validating and using the instrument reliability. The determination of validity is intended to determine the accuracy and accuracy of a measuring instrument in carrying out its function. Kadir et al. (2019) explains that the focus of validity is to reduce the effort required to repeat the experiment. The validity test involves experts. The goal is to measure the validity and ability of the instruments developed to carry out their functions. Besides, the validity test is also carried out to test the suitability of the instruments

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when used in the learning process (Rahmah et al., 2019). The assessment uses a Likert scale starting from number 1, which shows the quality of the instrument if it is not good to number 5 if the quality of the instrument is very good (Costouros, 2020). In full, the results of the expert validity test can be seen in Table 2.

Table 2. Results of Validation of Psychomotor Instruments in Service and Baverages Bubject

No	Aspect	Average	Category
1.	Material	4,56	Very Valid
2.	Construction	4,59	Very Valid
3.	Language or Culture	4,71	Very Valid
	Mean Total	**4,61**	**Very Valid**

As shown in Table 2, the validity test of this authentic, effective assessment instrument is divided into three parts, including (1) material; (2) construction; (3) language or culture. From the results of the validity test on the material aspects of the students' independence instruments in the Juice baverage competence, the results of the average evaluation were 4.56 in the very valid category. These results indicate that in terms of the material, the instrument developed was by the indicator material. In the construction aspect of the students' psychomotor instruments on the beverage Juice competence, the average validation result was 4.59 with a very valid category. The constructs referred to in this validity test include: (1) the statement in the instrument is formulated briefly and clearly; (2) the sentences in the instrument are free from irrelevant, negative, referring to the past, and (3) the sentences in the instrument are free from uncertain statements.

In the language or culture aspect, the Juice Baverage competency psychomotor instrument obtained an average validation result of 4.71 with a very valid category. These results indicate that the authentic psychomotor assessment instrument has met the requirements of using language or culture: (1) communicative language; (2) using standard Indonesian; and (3) not using taboo language. Based on the results of the validation of students' psychomotor instruments on Juice baverage competence on average on three aspects of the material, namely the construction, language or culture assessment of the three instrument validators of student independence on the baverage juice competency, the average validation result was 4.61 with a very valid category. This indicates that the instrument developed is appropriate and can be used as a tool to assess psychomotor assessments.

Furthermore, reliability is the stability of the score obtained by the same person when tested again with the same test in different situations or from one measurement to another. Reliability can also be interpreted as consistency or consistency. An evaluation instrument is said to have a high-reliability value if the test made has consistent results in measuring what it wants to measure (Ariyanto et al., 2019b). Reliability provides the consistency that makes the fulfillment of the main requirements, namely the validity of an instrument score results. At this stage the psychomotor instruments are implemented or tested in real situations, namely in the food and beverages service management class. Implementation in class involves the teacher, 3 observers, and 39 students. This stage is carried out to test the reliability level of the instrument. Reliability, the instrument of psychomotor learning outcomes, was carried out by 3 observers to look for similarities and establish the observer's equation until the observer's perception of the equation was reached, to determine the tolerance for differences in observations using the Kappa Coefficient Formula.

The instrument has agreement criteria if the IKK score is> substantial (0.6) according to the criteria of the kappa agreement. After the data is obtained, the data is analyzed by mastery classification with the classification of master and non-master students adjusted to observers 1, 2, and 3, followed by creating a work matrix to calculate the kappa coefficient. After that, analyze the number of non-master masters. Analyzing the number of masters and non-masters from observer 1 and observer 3 is shown in Table 3 as follows.

Table 3. Analyzing The Number of Masters and Non-Masters from Observer 1 and Observer 2

Observer 2		Observer 1		
		Master	**Non-Master**	
	Master	a = 19	b = 4	a + b = 23
	Non- Master	c = 1	d = 8	c + d = 9
		a + c = 20	b + d = 12	Total 32

Table 4. Analyzing The Number of Masters and Non-Masters from Observer 1 and Observer 3

Observer 3		Observer 1		
		Master	**Non-Master**	
	Master	a = 19	b =1	a + b = 20
	Non- Master	c = 1	d = 11	c + d = 12
		a + c = 20	b + d = 12	Total 32

Table 5. Analyzing The Number of Masters and Non-Masters from Observer 2 and Observer 3

Observer 3		Observer 2		
		Master	**Non-Master**	
	Master	a = 19	b =1	a + b = 20
	Non- Master	c = 1	d = 11	c + d = 12
		a + c = 20	b + d = 12	Total 32

Information
a : The number of students classified by the master by the two observers.
b : Number of students classified as non-masters by observer 1 but classified as master by observer 3.
c : Number of students classified by master by observer 1 but classified as non master by observer 3.
d : Number of students classified as non-masters by both observers.

From the number of masters and non-masters from observer 1 and observer 2, analyzed as follows.

P_0 by formula:

$$P_0 = \frac{(a+d)}{N} = \frac{17+13}{32} = \frac{25}{32} = 0,781 \tag{1}$$

Cohen-Kappa Reliability

$$KK = \frac{P0-Pe}{1-Pe} = \frac{0,843-0,554}{1-0,554} = \frac{0,293}{0,45} = 0,651 \tag{2}$$

From the number of masters and non-masters from observer 1 and observer 3, analyzed as follows.

P_0 by the formula:

$$P_0 = \frac{(a+d)}{N} = \frac{17+11}{32} = \frac{28}{32} = 0,875 \tag{3}$$

Cohen-Kappa Reliability:

$$KK = \frac{P0-Pe}{1-Pe} = \frac{0,875-0,531}{1-0,531} = \frac{0,344}{0,47} = 0,731 \tag{4}$$

From the number of masters and non-masters from observer 2 and observer 3, analyzed as follows.

P_0 by formula:

$$P_0 = \frac{(a+d)}{N} = \frac{19+8}{32} = \frac{27}{32} = 0,843 \tag{5}$$

Cohen-Kappa Reliability

$$KK = \frac{P_0 - P_e}{1 - P_e} = \frac{0,843 - 0,576}{1 - 0,576} = \frac{0,267}{0,424} = 0,629 \tag{6}$$

So it was concluded that the Kappa coefficient for the three observers was as follows.

$$Kp = \frac{0,651 + 0,731 + 0,267}{3} = 0,671 \tag{7}$$

Reliability is related to consistency, meaning that whatever is tested, the question has almost the same value. Reliable is also related to Rxy product moment. So that it can be concluded that the question is said to be reliable if it has a calculated proxy> Rxy table. N = 32 students and based on the Rxy product moment table 0.349. The reliability of the kappa coefficient for the three observers is 0.671> 0.349. Based on the analysis conducted, it can be stated that the psychomotor test instrument can be used as a psychomotor instrument in basic services and courses during the Covid 19 pandemic.

Disseminate Stage
After obtaining the validity of the expert and the reliability of the instrument, it can be used as an instrument to assess psychomotor learning outcomes in service and baverage lessons.

Conclusion
Based on the results of the validation of the student psychomotor learning outcome assessment instrument in the service and leverage lesson, The average obtained in the material aspect is 4.56, construction is 4.59, and finally, the language or culture aspect is 4.71. The results of the evaluation of the three validators for the assessment of students' psychomotor learning outcomes in the service and leverage lesson resulted in a validation average of 4.61 with a very valid category. Another measuring tool is the reliability of the kappa coefficient for the three observers. The number is 0.671> 0.349. Based on the analysis conducted, it can be seen that the instrument of student psychomotor learning outcomes in service and leverage lessons can be used as a psychomotor instrument for service and leverage lessons.

Suggestion
The suggestion that can be given after conducting the research is that this psychomotor learning outcome instrument needs to be tested at a later stage, namely testing it on a broader scale, for example being tested in many vocational schools for culinary and can be more detailed into various types of drinks.

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