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Developing self-assessment instruments to measure students' performance characters in making dresses using a high-order thinking skills approach

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ABSTRACT

Self-assessment in practicum courses may develop students' character, for example, honesty, discipline, and responsibility. Moreover, it can also improve students' initiative and critical, creative thinking. However, assessment for practicum courses is often fully conducted by lecturers with minimum involvement from students. This study aims to develop self-assessment instruments to assess students' characters while performing fashion design practicum using the HOTS approach. The instruments were developed using the 4D model by Thiagarajan that consists of four stages, namely Define, Design, Develop, and Disseminate. The sample was collected purposively from 15 students taking the Haute Couture course. The developed instruments were validated by experts in fashion design and were considered "Almost Perfect". The interrater reliability index is higher than 0.7, meaning that these met the criteria required. The collected data were then analyzed using descriptive statistics. The self-assessment demonstrates that 14 out of 15 students were considered competent or had very good performances. The developed instruments can, therefore, be used to assess student's performance characters in practicum courses as they may measure students' competency (hard skill) and characters (soft skill). This study reveals that self-assessment of work attitudes needs to be attempted during practical learning to enhance students' learning motivation and develop their relevant competencies.

Keywords: HOTS, performance character, practicum course, self-assessment instrument

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INTRODUCTION

The change of paradigm from teacher-centered learning (TCL) to student-centered learning (SCL) in learning has affected the assessment system (Priyatmojo, 2010). In TCL, lecturers manage to reach learning outcomes and become the main source of information. Meanwhile, in SCL students have the opportunities and facilities to be able to develop their cognitive aspects so that they gain comprehensive knowledge and improve their competence (Ardian & Munadi, 2016; Hadi, 2007). SCL is believed to be very effective in improving the learning process which leads to optimum students' learning achievements (Hadi, 2007). Commonly, assessment results depend only on lecturers as students are never involved in the assessment process. Students are deemed unfit to self-assess their performance because they cannot decide (Beumann & Wegner, 2018; Trisnawaty et al., 2017). Therefore, it is important to involve students as the assessors in the current learning assessment.

Currently, students have a great contribution and role in self-assessment. This type of assessment is a method that focuses on students. The implementation of self-assessment in the

learning process encourages students to take responsibility and allows them to assess their learning achievements. Therefore, they can be independent as they practice improving skills in assessing and evaluating. Student self-assessment is rarely carried out to assess skills and cognitive and affective aspects (Benlahcene et al., 2020). Self-assessment is defined as a process that requires students to monitor and evaluate the quality of their thought and behaviors while learning. In addition, they are required to identify strategies to increase their understanding and improve their skills (McMillan & Hearn, 2008). If students can consistently carry out self-assessment, good characteristics such as honesty, discipline, responsibility, self-motivation, and willingness to improve themselves may be possessed. Performance characters consist of qualities that enable individuals to regulate their thoughts and actions in a way that supports them in achieving something (Seider et al., 2013).

One of the problems in designing character assessment that includes character performance is the limitation of assessment tools to assess characters. Therefore, efforts to develop an organized instrument that assesses character are needed (Mutohir, 2012). In general, current practicum courses do not meet the work requirements (Slamet, 2011). Industries expect educational institutions to include character education as early as possible (Isnawati et al., 2019). Furthermore, it is expected that educational institutions improve students' intelligence, physical qualities, instrumental qualities, integrity, and especially performance characters during learning. Besides having good character, educational institution graduates should be competent, smart, sociable, and IT literate. Characters integrated into learning may improve students' achievements (Supriyadi et al., 2019).

Students, the nation's generation, should have Higher Order Thinking Skills (HOTS). HOTS includes a thinking process that requires students to do more than just memorize and convey information (Fitriani et al., 2020). It is someone's ability to connect, manipulate, and transform information and experiences into critical and creative thinking (Harjo et al., 2019). Using HOTS, someone may make decisions and solve problems in a new situation. Critical thinking is an organized process that allows students to evaluate evidence, assumptions, logic, and languages that underlie human thought (E. B. Johnson, 2007). Developing a HOTS assessment is challenging because the quality of students' intelligence and knowledge must be considered. The form of evaluation that needs to be developed in vocational education is cognitive skills for productivity (Hadiati et al., 2019). Improving vocational students' HOTS, especially those taking fashion design majors, aims to generate creative fashion designers. Therefore, they will be ready to adapt to the world of work (Widihastuti, 2014).

There are two different types of higher-order thinking skills needed for problem-solving, namely analytical, and creative thinking (Raiyn, 2016). For students at vocational schools especially those taking the fashion design major, higher-order thinking skills are urgently needed. In practicum classes, students are required to design and create a fashion item. Making designs to create new fashions requires higher-order thinking skills (Ardhian et al., 2020). The skill helps students express their creative ideas about fashion. In addition, their ability to solve fashion problems is very much needed because in creating fashion items, they need to work based on a certain pattern. Based on observations in the Fashion Design Study Program, assessments are mostly done by lecturers, and there are only a few classes that involve students in self-assessment. However, some classes implementing self-assessment still have limitations because students are asked to assess only cognitive and behavioral aspects. Because the number of student self-assessments, especially on performance characters (Saleh & Jing, 2020) is small, the quality of assessment should be improved immediately.

Self-assessment is a technique that requires students as the object being assessed to assess the achievement of their competence in certain classes. Based on the 2013 curriculum, students are asked to assess their performances regularly. The performance should follow the skills possessed. The student's ability to accurately assess their performance requires continuous practice. In every class, students must be able to assess themselves honestly and responsibly. Therefore, students' feedback is the most important factor in getting reliable self-assessments. Self-assessment includes collecting information, self-reflecting, and with certain consideration improving performance and quality based on evidence and definite criteria. This type of

assessment enables students to have self-awareness and self-understanding that may be improved in the future (Farisi, 2012). Students fill out a self-assessment sheet developed based on agreed criteria, and after being revised the sheet will be submitted. The self-assessment component may bring several benefits, and one of the most important benefits is feedback from students, which shows that self-assessment makes them study regularly. Students work on what they are asked to do, and they regularly check their performances (H. Andrade & Du, 2007). Character refers to special good values and willingness to do good, live well, and positively impact the community. Those traits are reflected in behaviors. Moreover, character results from individual thinking, feelings, exercises, and actions. It is a special characteristic of individuals or groups that contains values, abilities, morals, and abilities to deal with problems or obstacles. Character development trains various values among students including carefulness, thoroughness, perseverance, honesty, objectivity, and tolerance (Widowo & Kadarwati, 2013).

As an educational institution that produces teachers, Universitas Negeri Yogyakarta (UNY) plays an important role in training a workforce with good attitudes and character. According to Wahab (2011), UNY is expected to be able to produce graduates with good character and strong integrity. The graduates are expected to be ready to become agents of change and create a better future. In the industry context, performance characteristics must be considered (Fitriani et al., 2020). Their performance characteristics strongly influence the quality of someone's performance. Performance character is the quality of individual performance which includes intrapersonal and interpersonal aspects. Intrapersonal performance comes from an individual's subconscious mind, for example, honesty, responsibility, perseverance, motivation, honesty, or determination. These characteristics are related to creativity and innovation. Meanwhile, interpersonal performance is shown by how individual socialize, help each other, respects others, have commitment, and have leadership. Individual characters can be revealed through measurement and observation (Supriyadi et al., 2020).

In the fashion design study program, students commonly make fashion items for men, women, or children by considering the design, pattern, accessories, and sewing technology. Sewing is a very important stage in creating fashion items. It puts together the fabric being cut based on the pattern or design. Thus, the sewing techniques used should follow the designs. If the wrong technique is used, the clothes will be of low quality (Ernawati & Nelmira, 2008). This study aims to develop the right self-assessment instruments and rubric to measure students' competence in fashion design using HOTS. Moreover, this study investigates the self-assessment procedure to measure students' performance character and examines the profile of performance character in making dresses. The results of this study will benefit the self-assessment process, competence development, and performance character building with the HOTS approach since the designs made using critical and creative thinking may result in quality fashions.

METHOD

The self-assessment instruments were developed based on the Research and Development (R&D) model by Thiagarajan (1974). As mentioned by Bright & Gideonse (1968) that R&D can facilitate a systematic study for developing instructional objectives, strategies, teaching materials, and learning processes. The stages of development include the Define stage or preliminary research, needs analysis, and development of the instrument concept. The second stage, Design, involves some activities, for example, instrument development (questions, assessment sheets, and rubrics). The third stage, Development, is carried out to validate the instruments. At last, in the Dissemination stage, the instruments were used on a small scale.

The population of this study was students of the Fashion Design Study Program in the Faculty of Engineering at UNY. The sample was taken from students taking the Haute Couture course. There were 15 students selected using purposive sampling. They were six students with high learning achievement, six students with moderate learning achievement, and three students having low achievement. The procedure for developing a self-assessment instrument is presented in Figure 1.

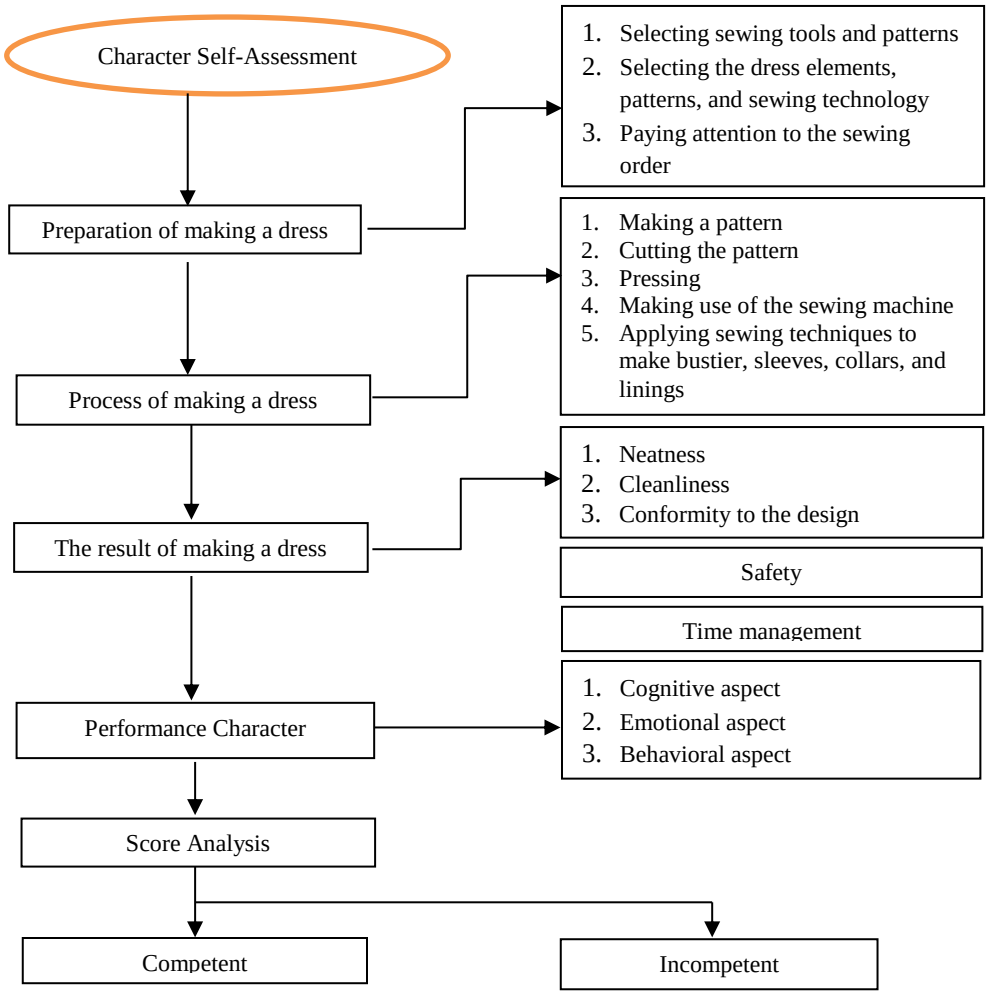

Figure 1. The Procedure for Developing the Self-Assessment Instrument

The self-assessment instruments developed are presented in Table 1. The data of the dressmaking process were collected using assessment sheets and a rubric containing some categories, namely Excellent, Good, Fair, and Poor. The performance characters were measured using self-assessment instruments of performance characters.

Table 1. The self-assessment instruments

No	Type of Instrument	Developed Aspect	Number of Items
1.	Self-assessment instrument to measure students' competences	a. Question sheets	1 set
		b. Assessment sheet	
		c. Rubric	
2.	Self-assessment rubric	a. Cognitive aspect	7 items
		b. Emotional aspect	29 items
		c. Behavioral aspect	3 items
3.	HOTS instrument	a. Design Analysis	5 items
		b. Evaluation	3 items
		c. Creation	14 items

The categories of students' performance characteristics in making a dress are Strongly Agree, Agree, Disagree, and Strongly Disagree. Students' HOTS is categorized into Yes (1) and No (0). Experts validated the instruments for fashion design and clothing measurement. The data

collected from the expert judgment process was categorized based on the V Aiken coefficients, and the validity results are presented in Table 2. Meanwhile, the instrument reliability was measured using a Kappa inter-rater. Students then used the instruments meeting the validity requirement to do a self-assessment on fashion design practicum which is elaborated in Figure 1.

Table 2. V Aiken coefficients

Value of K	*Strength of agreement*
< 0	Poor
0 – 0.20	Slight
0.21 – 0.40	Fair
0.41 – 0.60	Moderate
0.61 – 0.80	Substantial
0.81 – 1.00	Almost perfect

Source: (Craven & Morris, 2010)

The data analysis technique used was descriptive analysis. The student competence measurement in the practicum of making a dress is presented in Table 3.

Table 3. Scale of competence

Scale	Score	Competent/Incompetent
4	90 - 100	Yes
3	80 - 89	Yes
2	70 - 79	Yes
1	< 70	No

Source: BSNP (2014)

FINDING AND DISCUSSION

Finding

The self-assessment instruments to measure students' performance characters in practicum classes were developed based on the 4D model. However, this study is limited to the develop stage only. There are some stages to planning the instruments. The first is selecting the learning material. Women's dress is selected as it is the most common material studied in the study program. To create a dress, a student must have good soft and hard skills. Hard skills are learned continuously in the study program, while soft skills are related to characters that are naturally innate, not learned. Therefore, there is a need always to motivate students to have good performance characters.

The second step is to determine the instrument construction which includes pattern making, materials cutting, sewing preparation, sewing process, sewing results, time management, and work safety. a) making the instrument blueprint, b) developing items, c) designing assessment sheets, and d) developing rubrics.

The self-assessment instruments to measure students' performance characters also include three aspects, namely cognitive, behavioral, and emotional (Slamet, 2011). Meanwhile, the self-assessment instruments for making dresses consist of four assessment components, namely: 1) preparation for making dresses, 2) the process of making dresses, 3) the product, and 4) the time used (Budiastuti, 2012).

The question sheets developed in this study consist of instructions, types of work being practiced, practicum implementation, and criteria. Meanwhile, the assessment sheet includes types of activities (preparation, process, results, safety, and time management with weights, assessment scales, and competency. The rubric developed contains aspects assessed, a rating scale, a competency description, and a statement of whether the students are competent or incompetent. The competence criteria are based on BNSP (2013).

The instrument validity is measured using the inter-rater from Kappa. The reliability coefficient of the instruments meets the requirement or is greater than 0.70 (Litwin, 1995). Next, the self-assessment instruments are used by 15 students in dress-making. The rubric includes an assessment of cognitive, emotional, and behavioral aspects. The results of the trial are presented in Figure 2.

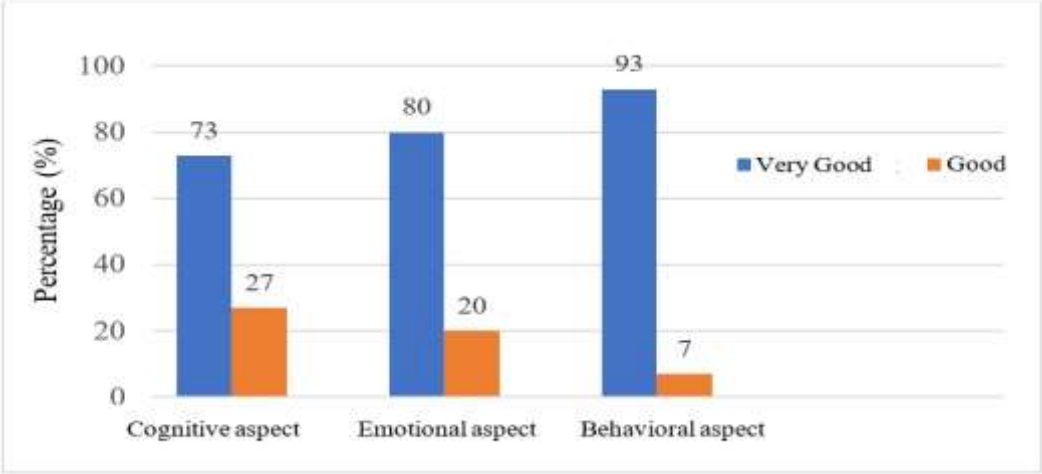

Figure 2. The result of the Performance Character Assessment in Making Dresses

The result of self-assessment in making dresses is shown in Figure 3. As many as 14 students completed making dresses and are considered competent. Meanwhile, one student is declared incompetent.

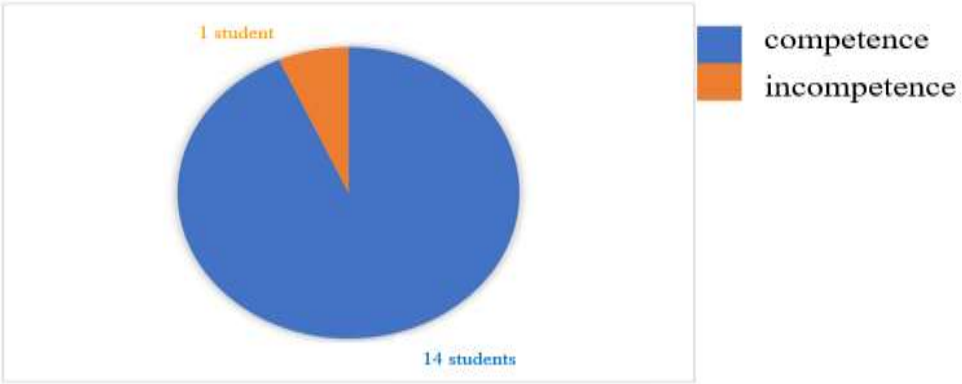

Figure 3. The result of the Dress-Making Assessment

The assessment that includes students' HOTS requires students to a) analyze the design (dress elements, creation concept, application of patterns, concepts of sewing technology, and sewing techniques; b) evaluate: the accuracy of each element measurement, the accuracy of the pattern used, and the accuracy of the sewing technique; and c) dress-making: pattern making, fabric cutting, and sewing techniques. The results of self-assessment on performance characters with the HOTS approach are shown in Table 4.

Discussion

The Define stage is a preliminary study of practicum courses in the Fashion Design Study Program. The Haute Couture course was selected because it can represent the practicum course material in fashion design. Haute couture is a fashion technology with high-level sewing techniques to produce exclusive and limited clothing. The sewing process begins with planning (looking for concepts, designing, choosing sewing techniques, choosing materials, making patterns, sewing process, and finishing) (Mufidah, 2021).

Table 4. Self-assessment with HOTS approach

Aspects being analyzed	Description	Answer	
		Yes	No
Design Analysis	Before making the dress, students know the defined design well.	15	0
	The students identify parts of the dress in the design before making the dress.	15	0
	Students can sew the dress parts into their complete form.	15	0
	Students determine the type of patterns to make the dress like the design.	14	1
	Students make plans of the materials needed to make the dress.	14	1
Evaluation	Students pay attention to the clothing measurement to meet the requirement determined.	15	0
	Students focus on pattern accuracy and suitability with the defined design.	15	0
	Students pay attention to the proportion of each part of the dress.	15	0
Creation	Students plan the order of work to make it easier to do the work.	13	2
	Students prepare equipment and materials properly so that the work runs smoothly.	15	0
	Students work based on procedures that begin with an analysis of designs and patterns, application of sewing techniques, and time management.	12	3
	Students make basic patterns according to the specified size.	14	1
	Students change the pattern according to the design.	15	0
	Students make a plan that includes materials and price to identify the things needed to make the dress	12	3
	Students put the pattern on the fabric following the design made.	12	3
	The fabric and the seam edges are adjusted to the specified size.	14	1
	Students pay attention to the technique of cutting materials to produce a good dress (accurate and proportional).	15	0
	Students prepare bundles of threads to be sewn before sewing.	12	3
	Students do press processes before and after sewing.	15	0
	Students apply stitching techniques to create a good dress.	15	0
	Students put the lining following the design determined.	15	0
	Students pay attention to the finishing technique to make a dress that matches the actual one.	15	0

The Design stage is the stage of developing self-assessment instruments to measure students' performance characters. This stage includes learning topic selection, namely designing a dress with a bolero. This topic is selected because its design, pattern, and sewing technology need critical and creative thinking that promotes HOTS. Krathwohl (2002) point out that higher-order thinking skills are measured from the abilities to analyze, evaluate, and create. Students are required to be able to solve problems in making dresses, including selecting the elements of the dresses, the right pattern, the order of sewing, sewing technology, pattern application, the way the dresses are made, and the accuracy of the measurements.

One of the important things that need more attention in the planning stage requires an assessment sheet and rubric development. Johnson et al. (2008) argues that in preparing more detailed assessment sheets and rubrics, it is necessary to pay attention to important elements, such as narration, varied sentence structures, sentence boundaries, spelling, and grammar.

In the Development stage, the self-assessment instruments are validated by three raters who are experts in fashion design and clothing measurement. The results of the instrument validation test with Aiken or V-Aiken validation to calculate the content-validity coefficient

from expert judgment shows that the V-Aiken value is 1 (almost perfect). These results indicate that the developed self-assessment instruments reflect Haute Couture course material, particularly in making dresses. The assessment criteria compiled reflect student competencies so that the validity of the instruments with the HOTS approach is in a good category (Budiastuti et al., 2019; Widihastuti, 2014).

Based on Figure 2, students' performance characters in the practicum of dressmaking that include cognitive, emotional, and behavioral aspects are considered Good. It indicates that students have good character in working. The characters are honesty, discipline, diligence, responsibility, integrity, work motivation, self-direction, etc. (Slamet, 2011). The other characters, such as passion, creativity, and persistence also have beneficial impacts on work (Gander et al., 2012).

Through several stages of development, the instruments can be used by students to do self-assessments according to the criteria honestly. Characters are closely related to positive attitudes in working. Students tend to be realistic in doing self-assessments because this type of assessment allows students to self-assess themselves and know their weaknesses (Lias et al., 2021). According to Zammi (2018), self-assessment is an effective instrument for developing students' positive attitudes. Self-assessment is effective for checking student work and changing work direction to improve learning quality and motivation (H. Andrade & Du, 2007). It also urges organizations and leaders to intentionally cultivate a good workplace culture by promoting positive attitudes among employees (Fallah, 2017). The problem that gets less attention is the workers' attitude towards the work, especially their self-confidence. A company needs to have employees who believe in themselves so that they can carry out their duties and responsibilities. Thus, institutions must know the extent of the confidence among their employees and continue to develop and improve it (Abun, Magallanes, et al., 2021).

The results of the self-assessment in this study show that most of the students are competent in making dresses. Moreover, they can assess their performance based on the scale and criteria determined. The application of self-assessment shows that lecturers give tasks to students based on the goals and criteria set (McMillan & Hearn, 2008). Based on the results presented in Figure 2, students' performance characters in working are good. Therefore, self-assessment develops students' positive attitudes (Zammi et al., 2018). This follows Kelberlau's (2006) research that self-assessment makes students more realistic about their goals and more accurately assess themselves to achieve their learning goals more easily. Similarly, Andrade (2019) and Abun et al. (2021) emphasize that self-assessment is useful for monitoring one's processes and products in achievement and independent learning.

Furthermore, it is found that students are honest, responsible when making mistakes, disciplined, creative, thinking critically when facing problems, confident in making a product, initiative, and self-driven. In line with Aqib (2012), character values are related to honesty, responsibility, discipline, hard work, and self-confidence, as well as logical, creative, critical, and innovative thinking. Self-assessment can be carried out if students complete certain tasks. A student's behavior is a critical factor in improving learning through self-assessment (Yang et al., 2022). In this study, the task is dressmaking which is done using HOTS. To make the dressmaking process run well and as planned, students should analyze the determined design before working. Besides, they also need to create the dress and evaluate the results. The results presented in Table 3 show that most of the students have done a good dress-making analysis according to the design. Students know the details of each element of clothing. However, in terms of the order of working, some students cannot describe the order systematically. This will affect work performance and time management. The work order in this study is the least activity done by students. It is a system that reflects that a procedure is done comprehensively. In making the dresses, students need to follow certain procedures to produce a quality result following the design (Ernawati & Nelmira, 2008) since they do answer not only the design brief but also translate design values (Press & Cooper, 2016). The research results indicate that self-assessment of work attitudes in practical learning needs to be applied to train students to self-evaluate their abilities and skills regarding work attitudes in their practical learning. It also demands lecturers to develop work attitude instruments in practical assessment related to

cognitive and psychomotor aspects. They are expected to implement a comprehensive assessment. By doing so, faculties, universities or associations will be ready to prepare vocational education graduates with positive attitude culture to support students' future careerfuture.

CONCLUSION

This study produces self-assessment instruments to be used in the practicum of fashion design classes. There are three instruments developed in this study, namely a work performance self-assessment instrument, a self-assessment instrument for performance characters in working, and a self-assessment instrument to measure students' HOTS in creating dresses. The developed instruments involve students as assessors. As the assessors, students will develop some characters, namely honesty, responsibility, initiative, creativity, responsibility, and motivation in learning. Because these instruments have never been developed for practicum courses in the Fashion Design study program, they must be applied continuously to check their effectiveness. The stages carried out in this study are limited to instrument development for a research population learning a practicum course. Further dissemination has not been done in this study. However, the result of the trial shows that the self-assessment instruments need to be used in study programs within the same department or the Faculty of Engineering.

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