

PAPER • OPEN ACCESS

Implementation of automotive skill competency test through 'discontinued' model on vocational school students in Semarang

To cite this article: Abdurrahman *et al* 2019 *J. Phys.: Conf. Ser.* **1321** 032135

View the [article online](#) for updates and enhancements.

You may also like

- [ICMLS version 3.0 as a prototype of bio-communication model for revolutionary human numerical competences on vocational education practices](#)
D Darmawan, A Kiyindou and C Pascal
- [Solving Flexible Job Shop Scheduling Problem based on Improved Genetic Algorithm](#)
Guofu Luo, Junjie Song, Zhongfei Zhang et al.
- [Eligibility of Certification Schemes for the Electrical Installation Competency of Electrical Engineering Education Study Program Students](#)
Hartoyo, D Laras, Zamtinah et al.



The Electrochemical Society
Advancing solid state & electrochemical science & technology

242nd ECS Meeting

Oct 9 – 13, 2022 • Atlanta, GA, US

Abstract submission deadline: **April 8, 2022**

Connect. Engage. Champion. Empower. Accelerate.

MOVE SCIENCE FORWARD



Submit your abstract



Implementation of automotive skill competency test through ‘discontinued’ model on vocational school students in Semarang

Abdurrahman*, D Widjanarko and Moeryanto

Mechanical Engineering, Faculty of Techniques, Universitas Negeri Semarang

*Corresponding author: abdurrahman@mail.unnes.ac.id

Abstract. The aim of the study is to determine the level of comfort and fatigue on students as well as the percentage of scores between students who are tested the automotive competency practice using the ‘continued’ and ‘discontinued’ model. The target to be achieved is to provide school input in the implementation of competency tests in order to be able to use competency test model that can provide more students comfort, reduce their fatigue, and obtain optimal scores for them. It is found that the competency test model conducted in the automotive skill on vocational school has used the ‘continued’ model, namely students are given several types of tasks and carried out continuously. This condition is tiring and the results obtained are not optimal. In the dissertation, the writer found ‘discontinued’ model test that the expert ensures will reduce the weaknesses on ‘continued’ model. This research is conducted by taking the sample of students of SMK N 4 Semarang, as many as 8 students who have been tested with two models. In the ‘discontinued’, students are given the chance to have a break after completing one task. The results shows that the ‘discontinued’ model lets the students obtain higher score and lower fatigue level. The conclusion of the study shows that using ‘discontinued’ model can be more beneficial than using ‘continued’ model. It is recommended that schools may use this test model in carrying out student competency tests.

1. Introduction

Increasing complexity in all facets of work, family, and community life, coupled with persistent calls for educational reform over the past several decades, present numerous challenges to professionals in career and technical education. The need to revise or eliminate out dated curriculum and develop new programs to meet emerging work or family trends is a seemingly endless occurrence [1]. One of the way to face the work demand is vocational education. The ultimate goal of developing vocational education is to help students develop and integrate knowledge, skills, and attitudes both academically and vocationally for fulfilling qualification framework. Qualification frameworks are ‘an instrument for the development and classification of qualifications according to a set of criteria for levels of learning achieved. Attainment of a qualification signifies that a learner has achieved the level of knowledge and competence in a particular field, occupation or field of study [2]. Competencies can be described as aptitude to pertain a set of related information, skill, and ability to execute "critical work functions" in a defined work situation [3].

In some of Vocational Education in Central Java Indonesia, especially in automotive field, the competency is tested to ensure that the students have had the ability to repair or maintaining vehicles. Generally, the automotive skills competency test conducted by vocational schools has been a ‘continued’



model. 'Continued' model is a test model requiring students work 5 or 4 tasks continuously for 5 hours or 4 hours. This makes them feel tired.

One of the results of the previous research in 2015, it was found that students' complaints about fatigue during the competency test becomes one of the causes why students obtain non optimal competency test scores. Therefore 'discontinued' test model is proposed. The results of 'discontinued' competency test have been tested through the opinions of academics, workshop practitioners, practitioners of competency testing teacher, vocational experts, and management experts. The results can be concluded that 'discontinued' model is feasible to improve 'continued' model. The results of these studies need to be followed up through trials on vocational students.

According to [4], vocational education was created to prepare students for specific jobs, but many argue that this focus on narrow training should change. Principally, vocational education has the main goal of creating graduates to be ready for entering jobs. [5] Also remind that education is basically *education for life* in general education and *education for earning a living* in vocational education. So according to him, vocational education is education to earn income for life. Students who are physically and psychologically exhausted while working on competency tests are not making optimal results. The research conducted by [5] about the Relationship Between Work Exhaustion and Work Productivity in Weaving Parts at PT. Alkatex Tegal, concluded that there is a relationship between work fatigue and work productivity in the weaving department at PT. Alkatex Tegal. The suggestions for weaving workers at PT. Alkatex Tegal is to get used to stretching muscles while working or taking a rest and using well-given rest periods. Thus the negative impact of work fatigue can even be fatal. Therefore it is necessary to have a break from resting time while doing work. Competency test that lasts for a long time (5 hours) is quite tiring, even for students who are taking competency test for 5 (five) hours under the supervision of the assessor is a heavy burden. Fatigue is not only physical but also psychological thing.

Competency is a combination of skills, behaviour / attitude and multiple knowledge that can be demonstrated by students where the skills, attitudes, and knowledge are obtained from the conceptualization of material that has been learned and meaningful in life. According to [6], a competency is the capability of / applying or using knowledge, skill, abilities, behaviour and personal characteristics to successfully perform critical work tasks, specific functions, or operate in a given role or position. The shift toward globalization and a knowledge-based economy as well as rapid changes in the lab or market now mean that hard work can no longer guarantee employment for young people. Students require a quality education to meet the competency demands of the workplace, and technological education is considered effective only if it meets the requirements of the industry in which they seek employment [7]. Facing new challenges is necessary to re-evaluate what set of knowledge, skills, and attitudes that professional needs in order to succeed in the rapidly changing global economy. Increasing the competitiveness of an enterprise's workforce represents increasing its opportunities to be successful [8].

To enhance competency, vocational schools need to enhance the learning experience as an important element of competency that is formed from the integration of knowledge, skills, and values (attitudes) contained in each subject productive [9]. Competence-based education has become a dominant trend in vocational and professional education [10]. Characteristics of the learning environment influence the degree to which and the kind of career competencies learned and used by students [11]. A competency refers to the knowledge, skills, attitudes, values, and behaviours that people need to successfully perform a particular activity or task, such as rewiring a house or performing a surgical procedure [12].

Observing from reality, competency tests conducted in vocational high schools up to now still have problems that is not paying attention to student fatigue. That's way, this research will determine the level of comfort and fatigue on students as well as the percentage of scores between students who are tested the automotive competency using the 'continued' and 'discontinued' model.

2. Methods

This research is descriptive research. Descriptive research is a type of quantitative research that aims to describe phenomena in education [13]. Some of the stages carried out in this study are explained as follows: determine the problem, determine the goal, make an instrument, determine the sample, collect data, analyze the data, conclude, and follow up the findings. This research was conducted in Vocational High School (SMK) around Semarang.

The variables observed in this study consisted of (1) student fatigue, (2) student score acquisition (3) competency test management. The research that will be used is descriptive research with a *sample at one point in time* model, which is a descriptive study that aims to report the characteristics of the object under study whose research data is obtained from measurements at one time only. The research data are collected through a trial of the implementation of 'continued' model competency test and 'discontinued' model. After the competency test, students are given a questionnaire to reveal the convenience of using a 'continued' model and a 'discontinued' model. Data are analyzed descriptively and in percentage.

3. Result and Discussion

Based on the results of the competency test on 8 students of SMK 4 Semarang using a 'continued' model on February 27, 2016 and the results of the competency test on the same respondent on August 27, 2016 with 'discontinued' model, the following data are obtained:

Table 1. 'Continued' model competency test results

No	Name	Tune Up EFI Score	Overhaul Engine Score	Manual Transmission Score	Electrical Body Score	Final Score
1	Risang Soko JD	90	88	92	93	91
2	Kukuh Rizky Ana	83	88	89	95	89
3	Ilham Tri Pramono	85	83	90	93	89
4	Kevin Eva Damara	83	83	86	93	87
5	Adi Sulistriyanto	93	91	89	93	92
6	Irfan Riza R	88	90	93	93	91
7	M. Yusuf Riza	85	86	91	93	89
8	Ari Tri Wibowo	88	88	89	93	90

Table 2. 'Discontinued' model competency test results

No	Name	Tune Up EFI Score	Overhaul Engine Score	Manual Overhaul Transmission Score	Electrical Body Score	Final Score
1	Risang Soko JD	90	100	100	100	97,5
2	Kukuh Rizky Ana	90	100	100	90	95
3	Ilham Tri Pramono	85	100	100	100	96,25
4	Kevin Eva Damara	90	100	100	100	97,5
5	Adi Sulistriyanto	90	100	100	100	97,5
6	Irfan Riza R	85	100	100	90	93,75
7	M. Yusuf Riza	95	100	100	90	96,25
8	Ari Tri Wibowo	90	100	100	90	95

The results in Tables 1 and 2 show the improvement of 'discontinued' model. The 'discontinued' model score is higher than 'continued' model score.

Table 3. The Level of physical and mental fatigue of ‘continued’ model competency test

No	Name	Score
1	Risang Soko JD	80
2	Kukuh Rizky Ana	90
3	Ilham Tri Pramono	89
4	Kevin Eva Damara	61
5	Adi Sulistriyanto	83
6	Irfan Riza R	78
7	M. Yusuf Riza	88
8	Ari Tri Wibowo	73

Criteria:

15 –33 : very not tiring

53 – 71 : tiring

34 –52 : not tiring

72 – 90 : very tiring

Looking at the results in Table 3, it is found that only one respondent said that ‘continued’ model test is tiring and 7 other respondents said it was very tiring. These results prove that ‘continued’ model competency test burdens students primarily in physical and psychological fatigue factors.

Table 4. Level of comfort in ‘discontinued’ model competency tests

No	Name	Score
1	Risang Soko JD	85
2	Kukuh Rizky Ana	90
3	Ilham Tri Pramono	90
4	Kevin Eva Damara	80
5	Adi Sulistriyanto	79
6	Irfan Riza R	82
7	M. Yusuf Riza	88
8	Ari Tri Wibowo	77

Criteria

15 –33 : Very Uncomfortable

53 –71 : Comfortable

34 –52 : Uncomfortable

72–90 : Very comfortable

Table 4 proves that all respondents said that the competency test of ‘discontinued’ model makes them very comfortable and even the two respondents reach the maximum scores,90 score. The results in Tables 3 and 4 can conclude that competency test participants are happier with ‘discontinued’ models. This model gives students the opportunity to rest and restore their physical and psychological condition back to normal. After taking a rest, students work on the next assignment with good condition and concentration. Based on the results of the research, it is proven that two competency test models, namely ‘continued’ and ‘discontinued’ model obtain different results from the aspects of the score and the level of comfort of the participants. Looking from the aspect of obtaining the final score for each participant, the score is greater in ‘discontinued’ model test.

Transmission Overhaul, and Electrical Body. If we look at the differences in each test material, almost all participants have higher scores using ‘discontinued’ model. In the Tune up Engine material test, there is one participant, namely Erfan Riza R with ‘continued’ test model with the score 88 and ‘discontinued’ test model with the score 85. In the Electrical body material test, there are three participants, namely Irfan Riza R, M. Yusuf Riza, and Ari Tri Wibowo with ‘continued’ test model score of each 93 and the score of ‘discontinued’ test model are 90 respectively. Judging from the score, there is 3 points decrease for both the Tune up Engine and the electrical Body.

The total number of score given are for 4 test materials and 8 test participants totally 32 scores and there are only 4 scores decrease for ‘continued’ to ‘discontinued’ model. While the others, there are 28 scores which increase in ‘discontinued’ model test. There are 87.5 % score totally which is increasing

by the using of 'discontinued' model. Thus it can be concluded that the use of 'discontinued' model competency tests is more beneficial. The results of the research from the comfort aspect reveal the feelings experienced by students during the competency test in two models, 'continued' and the 'discontinued' model. They felt that 'continued' model is very tiring and all participants express displeasure with the 'continued' model. Of the 8 participants, 7 participants said they are in a very tiring category and only one participant stated in tiring category. These results indicate that participants are not happy with 'continued' model. Looking from the implementation of the competency test using 'discontinued' model, all participants (8 participants) belong to the very comfortable category. Participants feel that 'discontinued' model competency test brings them calmer, tireless, and given enough rest time so that they are more comfortable than using 'continued' competency model test which is so tiring that can make concentration declined.

From the review of the score and the comfort of the participants in conducting the competency test, it is clear that 'discontinued' competency model is proven to give higher score results and participants feel more comfortable. This feeling of comfort and tireless makes them more able to do tasks with full concentration so that the results of the score can increase. This result is in accordance with the assessment of experts who have given input that 'discontinued' competency model is feasible. From the table 1, the results of the 2014 research conclude that 4 validators stated that they are very feasible, 4 validators stated they are feasible, and 2 validators stated that they are quite feasible. Thus it can be concluded that 'discontinued' model is feasible.

The effects of work fatigue are: a) Declining work performance; b) Decreasing motor and neural physiological functions; c) The body condition feels bad; d) Declining work. Thus the fatigue factor in competency testing should be considered so that student achievement becomes optimal.

4. Conclusion

Based on the result of the research and discussion above, it can be concluded that students feel more comfortable using 'discontinued' competency model test. Since the use of discontinued model is more beneficial, the Continued Competency Model Test is proved to be tiring when tested to the students. The scores obtained by the students taking part the test show that those scores are significantly higher when they are treated by 'discontinued' that 'continued' model.

References

- [1] Rojewski J 2002 *J. Vocat. Educ. Res* **27** 7
- [2] Foster S, Bateman A, Delaney B and Dyson C 2007 *Natl. Cent. Vocat. Educ. Res. (NCVER)* **9** 12
- [3] Singh C D and Khamba J S 2014 *Int. J. Eng. Bus. Enterp. Appl* **9** 44
- [4] Lazerzon M and Grubb W N 1974 *American education and vocationalism: a documentary history 1870-1970* (New York, NY: Teachers College Press)
- [5] Finch R C and John R C 1979 *Curriculum Development in Vocational and Technical Education* (Boston: Allynand Bacon Inc)
- [6] Ennis M R 2008 *Competency Model: A review of the Literature and Them Role of Employment and Training Administration (ETA)* (Pilot and Demonstration Team Division of Research and Evaluation Office of Policy Development and Research Employment and Training Administration U.S. Departement of Labour)
- [7] Shyr W J 2012 *Turk. Online J. Educ. Technol.-TOJET* **11** 195
- [8] Sripirabaa B, Benazir Y and Devipriya V 2014 *Int. J. Inf. Futur. Res-IJIFR* **2**
- [9] Bakar R 2014 *Int. J. Asian Soc. Sci.* **4** 722
- [10] De Bruijn E and Leeman Y 2011 *Teach. Teach. Educ.* **27** 694
- [11] Kuijpers M A C T, Meijers F and Gundy C. 2011 *J. Vocat. Behav.* **78** 21
- [12] Morris M H, Webb J W, Fu J and Singhal S 2013 *J. Small Bus. Manag.* **51** 352
- [13] Borg, Walter R and Gall Meredith D 1983 *Educational Research: An Introduction* (New Yorkand London: Longman)