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Models to Increase the Value of Learning Outcomes in Higher Education: Can Be Done in Offices and Other Workplacesi

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Abstract

Purpose: The goal is to determine the environmental conditions and workspace conditions after improvement and their effect on changes in the value of results in practicum.

Method/design/approach: Method/design/approach: The experiment was conducted with 30 people samples and data were obtained by means of calculations, measurements and questionnaires. The data is analyzed with discriptive statistics. Data is selected for subsequent analysis to see the results of changes to the improvements made.

Results and conclusion: The results obtained meet the expectations for an overall improvement of a work environment and workplace. It can be said that improvement models can be made to other workplaces. In the work done it is possible to be given a drink and snack or short exercise at a certain hour to generate new energy.

Research implications: this research shows the importance of using models like these to increase the value of outcomes.

Originality/value:with this research it is possible to disseminate to the scientific community and business owners to utilize models like this in order to get an increase in the value of results..

Keywords:*Practicum Environment, Practicum Participants, Practicum Place, Results Value*

Introduction

The desire to learn in class can be increased through the comfort of a study room that is created based on the condition of the body and the work environment. Body condition which means involving organs such as the five senses is very potential for students who carry out practicums.

The conditions of the work environment include the feelings felt when doing practicum such as environmental conditions, workload, work environment and body condition on the desk layout (GeetashreeBori et al,, 2016).

1. Working conditions are conditions that are felt in carrying out practicum work with a sense of comfort in the environment where the practicum is carried out (Andrea M. Cristiani et al 2014).

2. The atmosphere is comfortable in seeing something by involving lighting that is bright enough and meets the requirements so that the eyes don't get tired quickly.

3. Reduce glare so as not to make the eyes heavy and uncomfortable.

4. Placement of bookshelves must be made efficient and easy to reach so that searching for data does not add to the workload.

5. Workload is where the work done is adjusted to the abilities of those carrying out practicums (IinEmyPrastiwi et al.,2022).

6. Work environment, namely the practicum environmental conditions that must receive overall improvement

(In-Ju Kim, 2016)

Placement and use of tables and chairs must be arranged so that they do not block the road and reduce musculoskeletal complaints (Rashid Heidari Moghaddam et al., 2018).

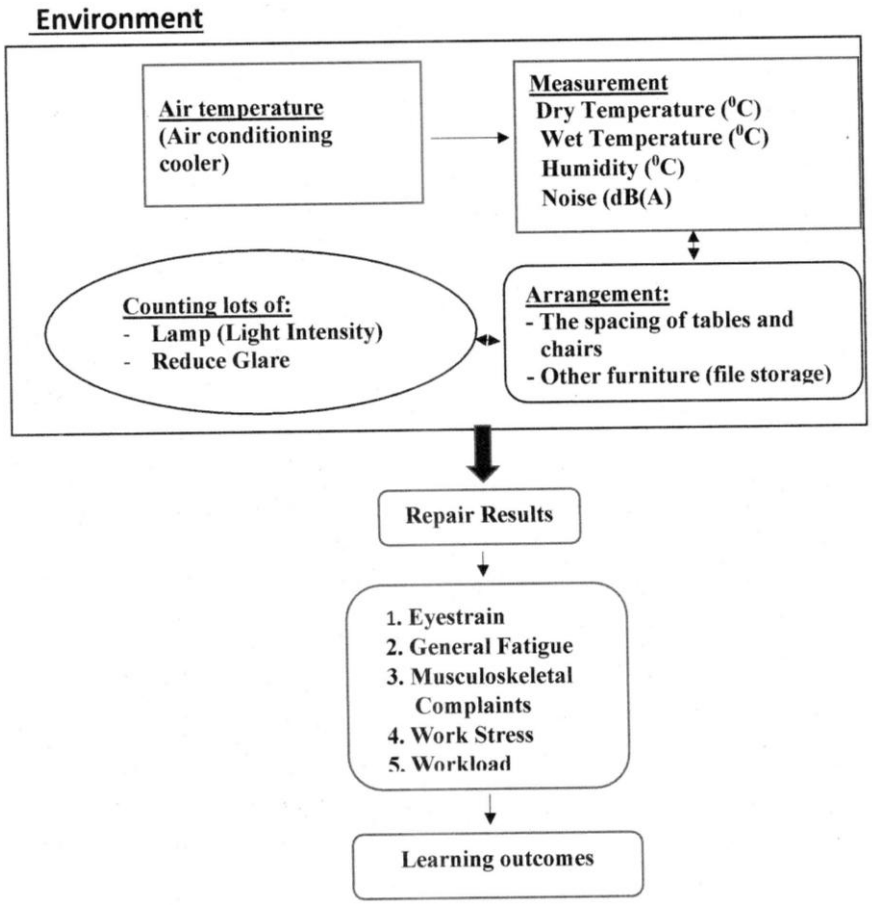

Figure 1. Work Summary

Source: Prepared by the authors (2023).

Problem solving is done by improving all conditions in order to get the best conditions and work comfort obtained.

2. Theory Review

This research was conducted by 30 students.

Based on the existing theory according to (Susi et al., 2012). Humans must work based on comfort in the workplace. Convenience according to (Wansoo Kim et al., 2018) must be expressed in working conditions that produce better results in increasing the value of work. According to (Linda Van Der Spaa et al., 2020) that the value of work can be increased if it meets predetermined conditions.

Many of the models offered in workplace improvement are not all focused on how to improve the place where humans work and regulate the work that should be done.

3. Materials And Methods

3.1 Material

The material in question is the workplace and work environment, a data search model will be carried out by involving 30 students as research samples. Data collection is carried out before and after students carry out practicum in the laboratory by making a model that is similar to work in general. In the process before the practicum takes place, the data collection process will be carried out twice, namely when it comes it will be

measured and given a questionnaire. This data will later be used as a reference for student conditions when traveling to campus and also before doing practicum. The practicum data search was carried out after several hours of practicum and several hours of practicum ended. This data is processed and used as research data in carrying out research model practicum to get real results.

The formula used to calculate:

3.1.1 Lighting intensity requirements (P. Van. Harten et al., 1985):

$$k = \frac{pxl}{h(p+l)} \text{.....(1)}$$

$$\rho = \rho 1 + \frac{k1-2}{k2(-2} (\rho 2 - \rho 1) \text{.....(2)}$$

$$n = \frac{ExA}{Q_{armature} x \rho x d} \text{.....(3)}$$

3.1.2 Need for Air Conditioning (AC) (P. Van. Harten et al., 1985):

AC formula (BTU) = (P X L X H I X E) / 60……(4)

Under the condition:

1 HP = 9,000 BTU/hour

3.2Research Methodology

The method in this study was carried out by calculating and directly measuring environmental conditions. Eyestrain, general fatigue, musculoskeletal complaints, work stress, workload, before and after doing practicum is done by giving questionnaires to students (Spencer Greenberg et al., 2016). The data will be processed to get the results of learning values by involving all data so as to produce an increase, decrease or still no change in the value of learning outcomes.

4. Results And Discussion

4.1 Results

Table 1. Descriptive Environmental Conditions Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Dry Temperature (^{0}C)	28	0.5	25.83	0.76	2.17	0.04
Wet Temperature (^{0}C)	23.67	1.04	20.83	0.58	2.84	0.04
Humidity (^{0}C)	72.67	4.04	62.17	0.58	10.5	0.03
Noise (dB(A)	33.87	8.07	3377	7.63	0.1	0.78
Light Intensity (lux)	110	11.83	247.67	8.16	-137.67	0.001

(¹) SD: Standard Deviation; (²) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 2. Descriptive Eye Fatigue Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Eyestrain Before Practicum	9.10	1.06	9.03	1.10	0.07	0.630
Eyestrain After Practicum	30.67	3.44	12.87	1.80	17.80	0.001
Different	21.57	3.46	3.84	1.56	17.73	0.001

(1) SD: Standard Deviation; (2) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 3. Descriptiv General Fatigue Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
General Fatigue Before Practicum	31.17	0.99	31.07	0.91	0.10	0.08
General Fatigue After Practicum	69.93	1.78	37.1	3.77	32.83	0.001
Different	-3.76	2.11	-6.03	-3.62	-32.73	0.001

(1) SD: Standard Deviation; (2) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 4. Descriptive Musculoskeletal Complaints Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Musculoskeletal Complaints Before Practicum	29.80	1.77	29.70	1.73	0.10	0.08
Musculoskeletal Complaints After Practicum	56.30	3.32	33.50	2.71	22.80	0001
Different	-26.50	3.67	-3.80	2.33	-22.70	0.001

(1) SD: Standard Deviation; (2) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 5.Descriptive Work Stress Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Work Stress Before Practicum	12.06	1.45	12.20	1.69	-0.15	0.43
Work Stress After Practicum	30.20	0.35	17.54	1.12	12.66	0.001
Different	-18.14	1.35	-5.34	1,26	-12.81	0.001

(¹) SD: Standard Deviation; (²) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 6.Descriptive Workload Statistics.

Variable	Before Redesaign		After Redesign		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Resting Pulse	74.00	6.14	73.77	6.14	0.23	0.33
Pulse of Work	86.57	9.07	83.90	8.66	2.67	0.001
Different	12.57	6.32	10.13	5.59	2.44	0.001

(¹) SD: Standard Deviation; (²) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 7. Descriptive Learning Outcomes Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Length of Time to Do the Exam	109.67	5.40	85.33	5.24	24.34	0.001
Test scores	59.60	4.05	82.53	3.87	-22.93	0.001

(¹) SD: Standard Deviation; (²) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 8. Descriptive Performance Statistics

Variable	EyesFatigue	General Fatigue	Musculoskeletal Complaints	Stress	Workload	Learning outcomes
Performance Before Redesign	30.87	69.93	56.30	30.20	86.57	59,75

Performance of the After Redesign	12.87	37.10	33.50	17.54	83.90	82,53

Source: Prepared by author (2023).

Table 9. Descriptive Performance Statistics

Variable	Before Repair		After Repair		Different	P value
	Average	Standard Deviation	Average	Standard Deviation		
Work Results (Performance)	59.75	4.05	82.53	3.87	22.78	0.001

(1) SD: Standard Deviation; (2) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

Table 10. DescriptivePerformance ResultsStatistics

Variable	Work Results (Performance)	Different	Performance Increase (%)
Performance Before Redesign	59.75	22.78	38
Performance of After Redesign	82.53		

(1) SD: Standard Deviation; (2) P Value: Trust value (P<0.05).

Source: Prepared by author (2023).

4.2 Discussion

Repairs made to:

4.2.1 Environmental conditions

a. Environmental

The amount of dry temperature, wet temperature, humidity and noise must be regulated, because it will interfere with practicum (JayeunKimat et al., 2017). The settings are as shown in Table 1, namely dry temperature before repair from 28 (0C) to after repair 26 (0C), wet temperature from 23.67 (0C) to 20.67 (0C), humidity from 72.67 (0C) to 62 ,17 (0C), and noise from 33.87 (dB)(A) to 33.77 (dB)(A) All environmental conditions must be obtained so that the practicum can concentrate on doing the practicum to be able to increase the value of the practicum results and this arrangement is carried out by adjusting the temperature of the Air Conditioner (AC) in accordance with the cold conditions of Indonesian society (Sukarman Hadi Jaya Putra, 2021). Sound or noise must be maintained in order to achieve concentration in doing practicum. All conditions must receive attention, including the sitting position according to the anthropometric measurements of the practicum body for communication purposes (Roland W. Scholz et al., 2003).

b. Light intensity

Eye fatigue begins with eye vision because vision has begun to decrease due to the ability of the eye to see things due to the influence of less bright lighting. Eyes with less bright lighting will cause eye pain so that the eyes become sore or watery eyes and will cause eye fatigue and work becomes hampered (Majid Motamedzade et al, 2018). At the initial practicum location, the light intensity was 110 lux and was still uncomfortable because the lighting conditions were still a bit dark. Dark conditions still affect the eyes to make movements while working and feelings of reluctance to make movements. After improvements were made by calculating the need

for lights in the practicum place, the light intensity was obtained at 247.67 lux. The light intensity is felt to be bright enough according to working standards (standard 200 lux to 250 lux) (P. Van. Harten and Ir. E. Setiawan, 1985). Increasing light intensity can be done by lowering the location of the lamp from top to bottom according to the light intensity needed so as not to increase the number of lights.

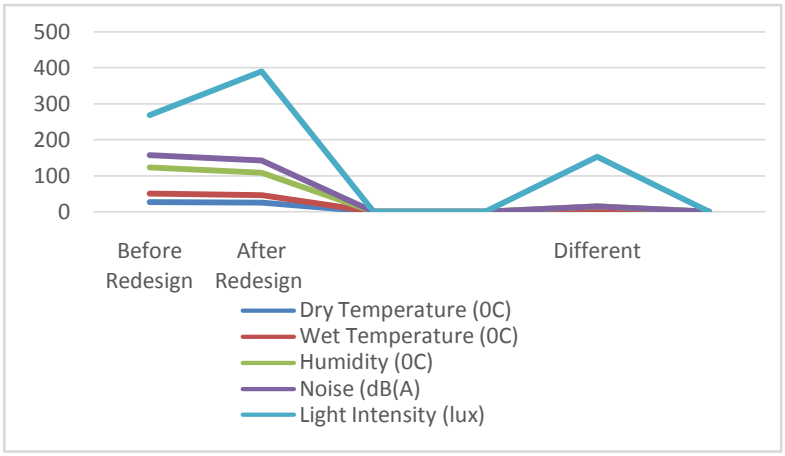

Figure 2. Environmental conditions before and after redesign

Source: Prepared by the authors (2023).

4.2.2 Complaints and fatigue that occur in those who do practicum

a. Eye fatigue

Eye fatigue begins with eye vision because vision has begun to decrease due to the ability of the eye to see something due to the influence of less bright lighting. Eyes with less bright lighting will cause the eyes to hurt so that the eyes become sore or watery eyes and will cause eye fatigue and work becomes hampered **(**Ela Nurdiawati et al., 2022**).** Eye fatigue can be reduced by providing a brighter light intensity so that the eyes have the ability to see things more clearly so that the eyes are not difficult to see things. Eye fatigue can also be caused by the intensity of light coming in from the window glass. The light intensity must come from above or from behind where we are so as not to cause glare **(**Dariusz Sawickiet al., 2019).

Before the repairs were made at the workplace, after the practicum, there was eye fatigue of 30.67 and after the repairs were carried out and the practicum was carried out, the value changed to 12.87. The decrease in eye fatigue in practicum after repair was 17.8 (58%). Changes in value that occur means that every improvement made must improve working conditions in the hope of reducing eye fatigue to carry out practicums and produce better practicum values.

b. General fatigue

General fatigue comes from the feeling factor in the body that affects a person in doing practicum **(**Sidra Sabir et al., 2021**).** The feeling factor that causes an unfavorable condition in the body that is doing the practicum must be eliminated immediately because it greatly affects the feelings of the person who feels it **(**Sidra Sabir et al., 2021**).** General fatigue before improvement and after practicum was obtained at 68.93 or general fatigue conditions were at a level that was sufficiently felt and after repairs were carried out and after practicum was obtained general fatigue was at 37.10 at the level felt. Changes experienced in general fatigue during practicum after repairs were 32.83 (47%). Common complaints refer to feelings that do practicum and improvements that must be made to the work environment of the practicum (W Cullen et al. 2002**).** Improvement of practicum conditions must be done based on a sense of comfort in practicum.

c. Musculoskeletal complaints.

The chair that is the back of the practicum seat does not use anthropometric measurements of the practicum so that those who do the practicum feel pain all over their back or experience musculoskeletal complaints

(Balmatee Bidassie, 2016). The requirement for a good chair is a chair with anthropometric measurements filled with armrests and backrests and covered with sponge **(**Surabhi Singh, 2013). A good chair is a chair that can be raised and lowered so that the sitting height of the chair can be adjusted to the low height of the table or sitting height. Musculoskeletal complaints can occur in anyone who does sitting or back work such as office workers or agricultural workers **(**Terry Jeremy Ellapen,2014**).** Before the repairs were carried out and after the practicum, musculoskeletal complaints were obtained at 56.30, but after the repairs were carried out and after the practicum was carried out, musculoskeletal complaints were obtained at 33.50. Musculoskeletal complaints after repairs and after practicum will decrease by 22.8 (40%).

d. Work stress.

Work stress can be caused by many factors such as rooms that do not support work, light intensity, air temperature, and workload (Susi-Purnawati et al. 2012). To reduce work stress, it can be done by improving everything that is needed by humans in carrying out practicums so that the practicum results can be achieved properly. The achievement of the value of the results of the practicum is the main hope of the improvement efforts made.

Work stress greatly affects the human condition in carrying out practicums to get better practicum values. The value of practicum results is the result of efforts to achieve success and achievement in a business that is the hope of a business. Work stress is more related to the work being done and it is too burdensome to do practicum. It is better if the work is carried out in accordance with the abilities of those carrying out the practicum so that it is not burdensome so that work comfort is achieved and work stress can be reduced **(**Paul Jiménez et al., 2017).

Work stress before the repair and after the practicum was carried out there was a stress result value of 30.20 and this stress result value included a high level stress result value. Work stress after repairs and practicum decreased to 17.54 and was classified as moderate stress. The decrease in the value of work stress after repairs and after practicum was 12.66 (42%). Work stress with a decrease in yield value of 42% is very well done in practicum conditions and makes the work system better.

e. Workload

For a workload it should be adjusted to the ability of the person doing the job and requires special expertise in determining the work that can be done by the person doing the job. The success of a business will be determined by the human condition in interacting with the environment, workload and body condition in a work system **(**EtiRusmiatiet al., 2021**).**

The workload can come from work done within the workplace. Workload can be reduced by environmental conditions and improvements that must be made**(**Ergin Ay et al., 2023**).** The workload obtained before the repair and after the practicum was carried out was 86.57 with a heavy workload level. After making improvements to the environment, conditions at work and adjusting to the workload carrying out practicums, there was a large decrease in workload to 83.90. The decrease in workload after repairs and after practicum was 2.67 (3%). Continuous workload can be reduced by making improvements according to existing conditions **(**Roy Wahyudi et al, 2018**)**.

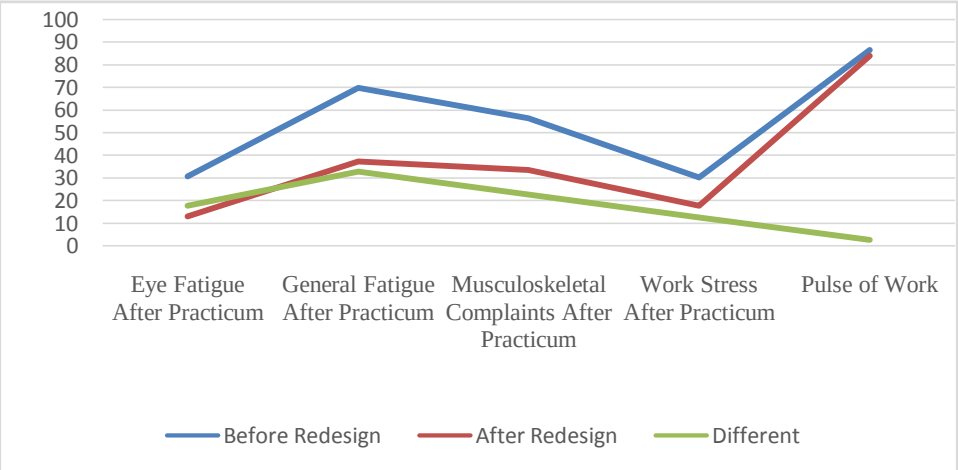

Figure 3. Practicum Conditions Before and After Redesign

Source: Prepared by the authors (2023).

f. Learning outcomes

The value of the results in the practicum is said to increase if it achieves an increase in the value of the results obtained from the practicum. Increasing the value of results can be achieved by improving existing conditions and making overall improvements **(**Megiridha Loppies et al., 2021**).**

The result value before improvement and after practicum is 59.75 and the result value after improvement and after practicum is 82.53. The change in the value of the results of the practicum after the repair was made was 22.78 (38%). The value of the results of this practicum is the result after a thorough repair of all disturbing conditions that must be thoroughly repaired such as: work environment, light intensity, eye fatigue, general fatigue, musculoskeletal complaints, work stress, and workload **(**Darlan Sidik et al., 2019 and Thuong T.N. Dinh1 et al, 2022**).**

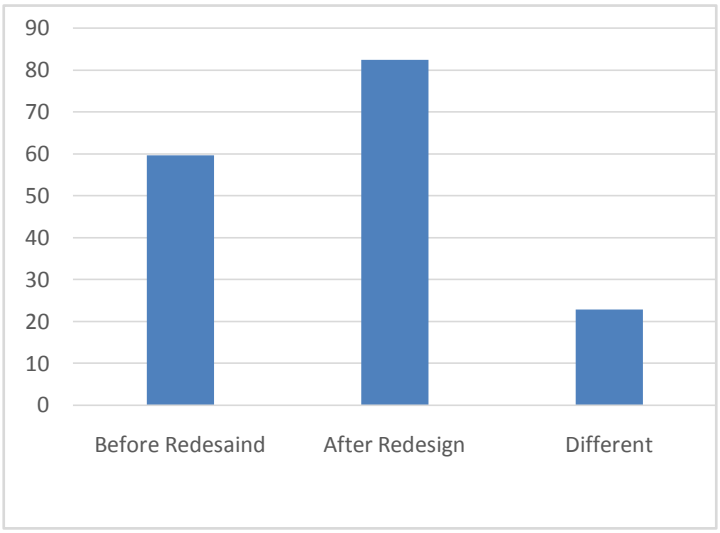

Figure 4. Result Value After Making Improvements to the overall condition

Source: Preparedbytheauthors(2023).

Novelty

Improvements must be made to each working condition by taking into account the environmental situation in the workplace so that an increase in the value of work results is obtained.

4. Conclusion

The conclusions that can be drawn from this research are:

Increasing the value of the practicum results is the goal so that the practicum becomes better with the improvements made. If possible, provide drinks and snacks or an impromptu exercise break at work at 10:00 or 14:00 for a few minutes to generate new energy.

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