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Practical Knowledge of Prospective Teachers’ In Pedagogy

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Abstract. Practical knowledge in pedagogy is a summary of the procedures taught during practical work that needs to be mastered by a teacher who wanted to carry out teaching and learning in the laboratory. Therefore, the aim of this study was to examine the practical knowledge in pedagogy in terms of safety, handling machines and hand tools. This study uses a survey method. Questionnaires were distributed to a total of 475 prospective teachers with equal division of 31 respondents for each of the areas of specialization offered. Data were analyzed by descriptive statistic. The findings indicate that the scope of practical knowledge in pedagogy of the prospective teachers in the Faculty of Technical and Vocational Education is high (mean = 3.32). These findings may provide guidance to prospective teachers to prepare themselves to be an educator in the field of vocational with skills and practical knowledge in pedagogical.

1. Introduction

Practical knowledge in pedagogy is a knowledge of education related to the scientific study of the principles and methods of teaching, encompassing the optimum teaching process in the laboratory [1]. As pedagogical knowledge changes from time to time, the pedagogical concept also changes according to its development. Currently, pedagogical concepts are more accurately described as concepts involving teaching methods based on educational research with the aim of obtaining effective teaching outcomes [2]. Generally, pedagogical knowledge is a course that must be followed by potential teachers as a guide for teaching in both classroom and laboratories.

In addition to be exposed to science on field skills, prospective teachers at FPTV UTHM are also educated with pedagogical knowledge to ensure the graduates will have a high quality of knowledge and profession while undergoing teaching and practical and real work [3]. In order to produce highly educated and proficient teachers, they must mastered the scope of practical pedagogical knowledge that has become a must-have for a prospective vocational education teacher at FPTV UTHM [4].
scope of practical pedagogical knowledge is focused on safety and handling of machine tools [5].
According to [6], the excellence of students in mastering practical learning depends on the teacher's
strategy in applying pedagogical knowledge. Thus, high quality and excellent students to develop a
Malaysian nation can be born [7]. The location of teaching and learning of vocational education
involves the demonstration of theory and practice teaching. The teaching plan of any course and
vocational education training that is managed should involve campus environments and relevant
employment environments based on the conditions within the Malaysian vocational qualification
framework.

2. Problem statement
Safety aspects in pedagogical knowledge include pre-teaching activities such as student readiness
checks, job assignment briefings, safety practice in laboratories and compliance with general safety
procedures [8]. According to [8], students who are not concerned about the safety and the indifferent
attitude towards work or work can pose a danger to themselves and their peers. This may be due to a
teacher who does not prepare daily teaching instruction in teaching, especially in the laboratory [9].
Although teachers will be exposed to pedagogical knowledge, there are also some who cannot apply
the knowledge learned in the teaching and learning process [9].

Teaching and learning in the lab also involve the handling of related machinery and hand tools.
Machine handling covers things such as reading and abiding by manual usage, proper and accurate
maintenance of machines such as cutting, drilling, welding, grinding, and similar hardware operated
by [10]. While handling hand tools includes such as maintaining cleanliness, labelling and storing
properly, perfect equipment usage procedures for proper work and safety knowledge of workpieces,
work hardware, self and others nearby at work stations [8].

In addition to mastering the theories in the classroom, potential teachers need to master the practical
lessons learned in order to give students an optimal understanding. However, in the handling of
machines and hand tools, there are teachers who provide less clear explanations and bring problems to
the practice of the workshop [11] This is because teachers feel less confident, less prepared and less
practical skills to carry out relevant practical lessons [12]. Thus, students are difficult to understand
the concepts taught by teachers and only memorize their learning and do not know how to apply them
in everyday life [9]. Thus, a study has been conducted to give more understanding and guidance to
future teachers in preparing to conduct better teaching and practical exercises in the lab better and
effectively.

3. Research Question
This study is conducted with reference to the following questions:
(i) What is the practical knowledge in pedagogy of prospective teachers in terms of
safety aspects?
(ii) What is the practical knowledge in pedagogy of prospective teachers in terms of
machine control and hand-held equipment in the laboratory?

4. Methodology Research
A total of 475 respondents was selected through purposive sampling method. The respondents
consisted of prospective teachers in Faculty of Technical and Vocational, Universiti Tun Hussein Onn
Malaysia (FPTV, UTHM). This study utilized a survey design method. This study was conducted
using a survey method. Using survey methods research can provide feedback by analyzing the data
obtained from questionnaires. The study was started with the collection of raw data through
questionnaire distribution. The questionnaire was divided into three parts: Part A (safety aspect) and
Part B (machine control and hand-held equipment in the laboratory). A questionnaire form developed
using five-point Likert scale that is very agreeable, agreeable, and uncertain, disagree and strongly
disagree. After data collection was created, descriptive analysis was conducted to obtain a population attribute description of the central tendency value to determine the direction of diversion. In addition, descriptive analysis is also conducted to obtain the mean value. With the analysis of the data, the translation of the values obtained can assess the practical knowledge in pedagogy for the prospective teachers in FPTV UTHM.

5. Finding
This chapter will be discussed about the findings of the study. The data obtained from the questionnaires that have been distributed and the detailed data analysis shown to answer the research question of the study.

Part A in the questionnaire is safety aspects of the practical knowledge in pedagogy. This section contains 10 items. Table 1 shows the findings of the mean score for the respondent's.

| Items                                                                 | Safety aspect                                           | Mean  |
|-----------------------------------------------------------------------|---------------------------------------------------------|-------|
| 1. I have first aid knowledge                                         |                                                          | 3.13  |
| 2. I always use protection tools when doing practical work in the lab |                                                          | 3.29  |
| 3. I know safety measures when using hand tools                       |                                                          | 3.37  |
| 4. I know the safety when handling a machine                          |                                                          | 3.37  |
| 5. I always keep a good ventilation when doing practical work         |                                                          | 3.48  |
| 6. I always keep safety during practical work to avoid accidents       |                                                          | 3.56  |
| 7. I make sure the hand tools are in a safe condition before use       |                                                          | 3.52  |
| 8. I make sure the machine is safe before use                          |                                                          | 3.46  |
| 9. I know how to use a fire extinguisher in the laboratory             |                                                          | 3.17  |
| 10. I know there are laboratory regulations are patched in the laboratory |                                                        | 3.53  |

Average 3.38

Based on Table 1, the findings for the safety aspects of the practical knowledge in pedagogy show the highest mean score is item 6 which is 3.56. Meanwhile, the lowest item is in item 1 which is the mean score of 3.13. Overall, the findings for the safety aspects of the practical knowledge of pedagogy have a higher mean score with an interpretation mean score of 3.38. This means prospective teachers’ in FPTV, UTHM have practical knowledge in pedagogy in terms of safety.

Part B in the questionnaire is machine control and hand-held equipment in the laboratory for the practical knowledge in pedagogy. This section contains 10 items. Table 2 shows the findings of the mean score for the respondent's.

| Item                        | Machine control and hand-held equipment in laboratory | Mean |
|-----------------------------|------------------------------------------------------|------|
| 1. I can handle hands tools very well |                                                       | 3.26 |
2. I can handle the machine very well 3.29
3. I know the function of each equipment in the laboratory 3.26
4. I know the function of each machine in the laboratory 3.29
5. I know how to choose the right equipment for the practical work 3.33
6. I know how to choose the suitable machine for practical work 3.30
7. I can explain how to use a proper hands tools 3.29
8. I can explain how to use the right machine 3.29
9. I'm good at using hands tools 3.29
10. I'm good at handling the machine in the laboratory 3.25
11. I know how to maintain the machine 3.02
12. I know how to maintain the hands tools 3.07

Average 3.25

Based on Table 2, the findings for machine control and hand-held equipment in laboratory for the practical knowledge in pedagogy show the highest mean score is on item 5 which is 3.33. Meanwhile, the lowest item is in item 11 which is the mean score of 3.02. Overall, the findings for the machine control and hand-held equipment in laboratory for the practical knowledge in pedagogy have a higher mean score with an interpretation mean score of 3.25. This means prospective teachers’ in FPTV, UTHM have practical knowledge in pedagogy in terms of machine control and hand-held equipment in laboratory.

6. Conclusion

As a conclusion of the study, safety is the key that needs to be emphasized in a teaching and learning session in the laboratory. As such, the appropriate teachers should master the safety procedures to ensure the safety of the workshop is guaranteed by complying with the law set out in the laboratory. Based on the analysis of the study the practical knowledge in pedagogy of prospective teachers has a high mean value in term of safety aspect. In terms of safety, teachers should know how to use first aid, handling fire extinguishers and the personal protective equipment and so on. Thus, it can be stated that the prospective teachers in FPTV, UTHM are very concerned about safety during teaching and learning in laboratories.

For machine operation, it involves reading and compliance a manual for handling machine and maintenance. Based on the findings of the study, the practical knowledge in pedagogy has high mean values. Thus, it can be said that prospective teachers’ in FPTV, UTHM are the individuals who are practically has a knowledge in handling a machines and hand tools during do their project in the laboratories.
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