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FEASIBILITY AND EFFECTIVENESS OF CONTINUING PROFESSIONAL DEVELOPMENT OF VOCATIONAL HIGH SCHOOL TEACHERS USING E-LEARNING PORTAL BASED INTERACTIVE MULTIMEDIA

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Abstract

This study aims to generate continuing professional development of Vocational High School Teachers of Electrical Power Skills Program using e-learning portal based interactive multimedia that has a good feasibility and effectiveness. The study was research and development involving several steps: needs assessment, planning, manufacture, black box testing, validation, revision, application, and finishing. Data collection was gained by testing, assignment, and observation, using item test, assignment sheets, and observation sheets. Data were analyzed descriptively. Findings of the study showed that the continuing professional development of Vocational High School teachers of Electrical Power Skills Program have been developed, using e-learning-portal based interactive multimedia, with web address in www.CPDguru.com; which has: (1) good feasibility, as indicated by the good results of black box testing and validation by materials experts, media experts and teachers were classified as good with an average score of 3.14; and (2) good effectiveness, as indicated by average of pre-test and post-test teacher's score were 48.8 and 74.93, in addition the average score of classroom action research proposal and Scientific Articles Journal was 71.6.

Keywords: continuing professional development, interactive multimedia, e-learning portal

1. Introduction

Act No. 14 of 2005 on teachers and lecturers, is the policy of direct intervention in order to improve the quality of teacher competence through the obligation policy that teachers must have a professional certificate. Zamroni proposed that the Act on teachers and lecturers is a political decree that teachers are professional workers, who are entitled to rights as well as professional liability, e.g.[1]. Hence, the teachers are expected to be able to devote totally to their profession and to live worthy from that profession. In order to establish that a teacher has met the professional standard, then the teacher must pass a competency test through the teacher certification program, so the teacher would get a teaching certificate and professional teacher predicate and professional allowance in the amount of monthly basic salary.

Professional teachers are marked by the acquisition of teaching certificates, should have the competency and good performance, which is in accordance with the standard. But in fact shows that not all of the teaching certificate holder having the competency and good performance. Studies conducted by PGRI of the impact of teaching professional certification on teacher performance showed that the performance of teachers who have pass the certification test have not been satisfied.

There were still quite a lot of teachers, including the Vocational High School (VHS) teachers, who after passing the certification program, were not trying to improve their competence and tend to perform like before

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getting a teaching certificate. The same thing was stated by President Susilo Bambang Yudhoyono, on the Commemoration of National Teacher Day and 66th PGRI Birthday on 30 November 2011 in Sentul, that the president was still receiving input from community members, most of those teachers who have passed the certification program and have received teaching professional allowance, it turns out that their performance have not been satisfied and have not changed much. Teachers who have obtained teaching certificate but have not yet demonstrated a good competence and performance, one of the reasons was the teachers did not want to develop their professionality. Teachers who are not making an effort to develop their professionality, could be assured that their competencies and performance mastery tend to decrease with the time elapsed.

As a logical consequence for teachers as professional workers , therefore the teachers must constantly improve their professionality. The activity of teachers professionality development should be continuous, incessant, and there would not be any point of professional capability reaching the final peak. Here is the essence that teachers must undergo a process of continuing professional development (CPD). CPD for teachers has been manifested in a legal umbrella namely MENPAN Regulations and Bureucracy Reforms No. 16 of 2009 on Teaching Professionality Functional and credit point that would be implemented starting in 2013. In Chapter V, Article 11, paragraph c, from that regulation it was mentioned that in broad outline the CPD for teachers covers included three main elements, namely: self-development, scientific publications, and innovative works

Based on preliminary studies in the form of field observations and interviews with some teachers of Sedayu 1 State VHS of Bantul, Pengasih 2 State VHS of Kulon Progo, showed that so far the model of professional development for VHS teachers were still partial, it has not shown its sustainability, and it has not displayed its optimization. This matter was demonstrated, among others: (1) functional training for VHS teachers was organized by the Agency for education and training (edutrain/diklat) in the Ministry of Education and Culture such as P3GT and VEDC, were very limited and could not reach all the teachers because of the limiting funds, education and training institution, instructors, and facilities and infrastructure ; (2) functional training for VHS teachers were not continuous, but were discontinuous with material that sometimes less relevant with the teachers expertise of who attended the training; (3) there are still quite a lot of vocational teachers were reluctant to attend the functional training if they had to pay with their own money ; (4) there was rarely VHS teachers who undertook a classroom action research, lesson study, presented scientific papers at scientific forums, writing articles in scientific journals, invention of an effective technology, art works, and labwork device manufacturing, whereas those activities have been so highly required as a condition for rank raising from class III / b to III / c, so there was a concern that many teachers who would stuck his rank in class IIIb.

To overcome the above problems, it is necessary to conduct a research on CPD for teachers, especially VHS teachers used E-learning Portal based interactive multimedia, so it could be expected that professional teachers would always be materialized. This study aims to generate CPD of VHS Teachers of Electrical Power Skills Program using e-learning portal based interactive multimedia that has a good feasibility and effectiveness. CPD was first introduced by Richard Gardner in mid 1970. CPD is an effort made for improving professional knowledge and skills continuously beyond the initial basic training required in carrying out the work. In the field of teaching, that development is an in-service training. In its development, CPD responsibility shifted from the school organizers and teachers into individual. The meaning of which was that the individual is currently responsible for the development of his professional career, e.g. [2]. Another opinion was given by the IFL in Peter Scales, at al. which stated that the continuing professional development of teachers is an effort to maintain, improve and expand their knowledge and skills relevant to the expertise of teachers that have a positive impact on the practice and the learning experience, e.g. [3].

Furthermore Stenhouse in Peter Scales, et al., stated that the outstanding characteristic of continuing professional development is the existence of an

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autonomous professional capacity for teachers to develop themselves through self-learning system, internships, research on the classroom action and so on, e.g. [3]. Based on the above opinions can be said that the continuing professional development was an activity done by teachers for maintaining, improving and renewing the teachers competency continuosly to improve the quality of teachers' work on the assignment.

Rose and Reynolds stated that CPD can be classified into three types, namely: (1). Direct teaching, such as courses, training, and workshops; (2) learning in school, such as peer coaching, colleague criticism, mentoring, classroom action research, and teaching team; and (3) Learning outside the classroom, such as network utilization cooperation, visits to other schools, inter-school activities, and so forth, e.g. [4]. As with the Kennedy which divided the nine models of CPD, among others: (1) training model; (2) bearing award model; (3) defecit model; (4) stairs model; (5) standard-based model; (6) coaching / mentoring model ; (7) joint-practice model; (8) research model on classroom action; and (9) transformative model, e.g. [5].

On the Regulation of the Minister of State for Administrative Reform and Bureaucratic Reform No. 16 of 2009, Chapter V, Article 11, paragraph c shows that continuing professional development is primarily based on three activities, namely self-development, scientific publications, and innovative work. The components are contained in self-development activities, namely: (1) education and functional training; and (2) the collective activities of teachers for improving their competency or professionality. Scientific publication activity component includes the following: (1) scientific publication of research products or innovative ideas in the field of formal education; and (2) the publication of textbooks, enrichment books and teachers' manuals. At inovative work activities consists of several components, namely: (1) finding the effective technology; (2) finding or creating the art works; (3) making or modifying kit lessons, or visual-aid lessons or labwork-equipments; and (4) follow the development of the preparation, guidelines, questions and the like.

Research conducted by the Offer and Pedder concerning benefits, status and effectiveness of CPD among others concluded: (1) Teachers who were doing professional development through seminars and workshops that are not clearly focus was less benefits; (2) CPD has a greater benefit mainly through learning such as courses or training; (3) Benefits for teachers in participating in CPD include the ability to collaborate with colleagues and gain new information, but the benefit level differ significantly between teachers, e.g.[6].

In contrast to Pedder Opfer research, research on teachers' perceptions of the score of CPD in South Africa conducted by Lessing and Witt shows the results include: (1) according to teachers opinion, workshop activities provide an added value for teachers because through the workshop can help enhancing their knowledge, increasing their motivation to work, increasing their working efficiency and motivating a better teaching habits; and (2) through the workshops the teachers could update their knowledge and provide an inspiration in advancing teaching at schools, e.g. [7]. It seems that this study gave different results from Opfer and Pedder research above. This might be due to the two studies were conducted in very different countries, this study was conducted in Southern Africa which is including in developing countries, while the above study was conducted in England which is including in developed countries.

Research conducted by Ono and Ferreira on a CPD case study by means of lesson study in South Africa showed that teachers who were engaged in lesson study in Mpumalanga could increase their knowledge and skills in teaching, e.g. [8]. But those teachers were not sure about the ease of lesson study implementation throughout South Africa. Another study conducted by Seezink and Poell on the CPD need for vocational education teachers at competency-based school, a case study in the Netherlands showed that teachers as an individual learns to improve his/her knowledge would have the creativity or new ideas in teaching, especially in the competency-based education, e.g. [9].

Along with the technology development in the computer field, recently has been available various software that can display text, sound, graphics, video and integrated and synergy animation, so that case was called multimedia. According Mussama, et al., multimedia term came from multi which means more than one and the meaning of that media is means of communication, so

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that multimedia is defined as a means of communication using a lot of media include sound, images, animation, digital video and text, e.g. [10]. There would be many possibilities for the application of interactive multimedia for learning, namely: (1) Classroom learning, if the place and time to learn is the same, (2) Synchronous learning, if time is the same but the learning place is different, (3) E-learning if the time is different, but learning place is the same , (4) WEB-base learning, if learning was done at any place and any time. As the way for measuring the successful of learning through the interactive multimedia model are: (1) Reaction and action plan of the presented material, (2) Changes in knowledge, affective and psychomotoric (3) The amount of material used in the real world, (4) economically accountable, (5) Production costs should not beyond the limits.

E-learning is short for electronic learning. One common definition of e-learning is: delivery of learning materials through an electronic media such as the internet, intranet / extranet, satellite broadcast, audio / video tape, interactive TV, CDROM, and computer-based training (CBT). The ILRT of Bristol University defines e-learning as the use of electronic technology to send, support, and improve teaching, learning and assessment. In addition, e-learning term covers a wide range of applications and processes such as computer-based learning, web-based learning, virtual classroom, and so forth; while the on-line learning is part of the technology-based learning resource that utilizes the Internet, intranet, and extranet resources.

2. Research methods

This type of research used in this research is the research and development, which is in general have some steps namely: need assesment, design, manufacture, testing and validation, revision , implementation, and finishing.The way of collecting data used in this study were tests, assignments, and observation. Tests performed include: (1) black-box testing, to test the functioning of the system, and (2) pre-test, post-test and assignments for teachers in the implementation of the CPD model-based using e-learning portal based interactive multimedia. The assignment given to the teachers to make a journal article or research proposal of classroom action which is consulted online to the experts. Observations made by media experts, material experts, and teachers for CPD model by using e-learning portal based interactive multimedia.

Instruments used at the black box testing was checklist functional system, while at the pre-test and post-test in the implementation of CPD model using problems set test. Instrument used to assess the tasks created by teachers in the form of sheets of assessment tasks. Instruments used in the validation activities by material experts, media experts, and teacher was validation sheet. Prior to be used those instruments should be measured their validity and reliability. Data analysis technique used was descriptive.

3. Results and Discussion

3.1. Research Results

Through research steps include:need assesment, design, manufacture, testing and validation, and revision, so it has been obtained the CPD for VHS teachers by using e-learning portal based interactive multimedia which has a web address at www.pkbguru.com. In testing step, the activities carried out was black box testing on the results of CPD for VHS teachers using e-learning portal based interactive multimedia, the results are as shown in Table 1.

At the validation step, the activities were done by 2 media experts, 2 material experts and 2 teachers on the product of continuing professional development of VHS teachers using e-learning portal based interactive multimedia with the results shown in Table 2.

The next research step was implementation or trial-test of CPD products of VHS teachers using an e-learning portal based interactive multimedia in the field. In this activity the CPD material was limited to the class action research material and scientific articles writing. The amount of teachers involved in this activity was 15 people who came from VHS Electrical Power Installation Engineering Skills Program in Yogyakarta Special Region. Trial activities was begun with an explanation of the model implementation of CPD of teachers using e-learning portal based interactive multimedia on 6 September 2014 in the Data Communication Laboratory, Electrical Engineering Education Department of Engineering Faculty of Yogyakarta State University. Before commencing the activities of implementing CPD teachers models using

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e-learning portal based interactive multimedia, the pre-test was firstly carried out.

Furthermore, the trial test activities on implementation of CPD of teachers using e-learning portal based interactive multimedia was on-line conducted until 10 October 2014. This activity consisted of independent study conducted by teachers and tutorial in classroom action research proposal writing or online scientific journals articles writing via www.pkbguru.com.

The teachers studied classroom action research material and scientific journal article writing published in www.pkbguru.com independently. If there were difficulties experienced by those teachers in learning that material could be delivered to the discussion forum facilities which would be responded by an expert or another teacher participants. In addition these problems could also be submitted through the tutorial facilities of "japri = personal network" which would be specifically responded by the expert.

In the activities of CPD teacher model trial-test, the teachers were also asked to make a research proposal of classroom action research (CAR) or scientific journal articles, which would be given a recomendation or an online tutorial by the expert. The results of classroom action research proposal made or scientific journal articles were then uploaded by the teachers through the "japri = personal network" facilities that existed at www.pkbguru.com.

Then the expert gave a recomendation on CAR proposal writing or scientific journal articles had been made by teachers through the "japri = personal network/persnet" facilities in the web address. The teachers then revised CAR proposal writing work or scientific journal articles in accordance with the recomendation given by the expert. The Revision results of CAR proposal writing or scientific journal articles done by teachers and then re-uploaded through the "japri=personal network/persnet" facilities in the web address. Thus PTK proposal writing or online journal articles tutorial were proceeded continuesly up to the expert gave a good score at the end for the works of

Table 1. Results of black box testing on the results of CPD of VHS teacher used e-learning portal based interactive multimedia

No	Name of Case Testing	Indicator	Testing results
1	Download free downloaded materials	Teacher could download free downloaded materials without registering as the member in www.pkbguru.com.	Success
2	Registe membe		
3	Downlc membe		
4	Accoun		
5	Registe		
6	Enter C		
7	Start Ne		
8	Writing		
9	Accoun	(login) prior to enter the system	

Table 2. Validation results conducted by media experts, matterial experts, and teachers to the CPD products of VHS teachers using an e-learning portal-based interactive multimedia

No.	Validator	Aspects	Achievement average	
			Score	%
1.	Media experts	Display	3,4	85
		Easily usage	3,22	80,5
		Material presentation	3,1	77,5
		Advantage	2,75	68,8
2.	Material experts	Material relevancy	3,35	83,8
		Technical	3,25	81,3
3.	Teachers	Display	2,9	72,5
		Easily usage	2,83	70,8
		Material presentation	3	75
		Advantage	3,2	80
		Material relevancy	2,86	71,5
Overall average			3,13	78,15

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classroom action research proposals or scientific journal articles.

Furthermore, the closing ceremony was held on October 11, 2014 in which the evaluation of trial test activities on the implementation of teacher's CPD conducted in the Data Communication Laboratory, Electrical Engineering Education Department of Engineering Faculty of Yogyakarta State University. At the trial test evaluation activities on those CPD teachers model implementation, the teachers were asked to do the Post-test. Pre-test and post-test scores achieved by teachers in the trial test on implementation of CPD of VHS teachers using e-learning portal based interactive multimedia was presented in Table 3.

Table 3. Pre-test and post-test scores achieved by the teachers in the trial-test on implementation of CPD teacher using e-learning portal

No	Participant Number	Pre test Score	Category	Post test Score	Category
1	01/UC/2014	60	Adequate	80	Very Good
2	02/UC/2014	48	Inadequate	76	Good
3	03/UC/2014	52	Inadequate	72	Good
4	04/UC/2014	36	Poor	64	Adequate
5	05/UC/2014	60	Adequate	84	Very Good
6	06/UC/2014	68	Good	92	Excellent
7	07/UC/2014	56	Adequate	76	Good
8	08/UC/2014	48	Inadequate	72	Good
9	09/UC/2014	48	Inadequate	76	Good
10	10/UC/2014	48	Inadequate	72	Good
11	11/UC/2014	40	Poor	76	Good
12	12/UC/2014	44	Poor	68	Good
13	13/UC/2014	40	Poor	72	Good
14	14/UC/2014	48	Inadequate	76	Good
15	15/UC-MMIBPE/2014	36	Poor	68	Good
Average score		48,8	Inadequate	74,93	Good

In the trial test on implementation of teacher's continuing professional development using e-learning portal based interactive multimedia, another activities among of which was tutorial to the teachers in writing of classroom action research proposal or online scientific journal articles via "japri=personal network/persnet" on www.pkbguru.com facility. The work of teachers in the form of classroom action research proposal writing or scientific journal articles was given recomendation by the expert, then was revised by the teacher, furthermore it was given a further recomendation by the expert and it was revised further by the teachers, as such online continously till that work was gained a good score. As for the score achieved by the teachers in the assignment of CAR proposal writing or scientific journal articles with an online tutor "japri=personal network/persnet" facility on www.pkbguru.com as shown in Table 4.

Table 4. Scores achieved by teachers in the assignment of writing CAR proposal or scientific journal articles with online tutor.

No	Participants Number	Working Type	Scores	Categories
1	01/UC/2014	CAR Proposal	75	Good
2	02/UC/2014	CAR Proposal	73	Good
3	03/UC/2014	R&D Proposal	71	Good
4	04/UC/2014	CAR Proposal	70	Good
5	05/UC/2014	CAR Proposal	76	Good
6	06/UC/2014	Article journal	74	Good
7	07/UC/2014	Article journal	72	Good
8	08/UC/2014	CAR Proposal	70	Good
9	09/UC/2014	CAR Proposal	73	Good
10	10/UC/2014	CAR Proposal	70	Good
11	11/UC/2014	CAR Proposal	70	Good
12	12/UC/2014	CAR Proposal	70	Good
13	13/UC/2014	CAR Proposal	70	Good
14	14/UC/2014	CAR Proposal	72	Good
15	15/UC/2014	CAR Proposal	68	Good

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Average score	71,6	Good

3.2. Discussion.

Research carried out by the steps include: need assesment, design, manufacture, testing and validation, and revision, has been obtained the results of CPD of VHS teachers of Electrical Power Instalalation Enginering Skills Program using e-learning portal based interactive multimedia, which has a web address at www .pkbguru.com.

The material contained in this CPD teacher model was limited to the classroom action research material and scientific papers writing. Those materials presented with some various display supported by flash program so it was capable of being displayed by the effects of motion pictures and writings, as well as accompanied by sound effects. The materials were available in two types, namely for a guest user and the member user.

Guest user could only download a freely downloaded material while the member user has privelege namely he/she could download the materials that could not be downloaded by the guest user. In order to become a member, the teachers could register via the registration. If the teacher has been successfully registered to be a member, then the teacher must firstly login by filling in your username and password. After the teacher has been successfully login, so the teacher got a few options such as user profiles features, teachers forum, and he/she could download the materials that require the prerequisite member as the user. Through the teachers forum so the member could discuss with the same teachers or could interact with the manager. Those functions as described above were obviously able to function properly.

The CPD of VHS teachers using e-learning portal based interactive multimedia, further testing were carried out by two kinds of testing namely black box testing and validation by media expert, material expert, and teacher. In the black box testing has been carried out every block functioning test from the whole CPD model system using e-learning portal based interactive multimedia. Black box testing results as presented in Table 1 shows that each block and the whole system was properly function. This means that every part of CPD model system of VHS teacher using e-learning portal based interactive multimedia could work synergistically so that the whole system could work well.

In the validation activities carried out by media experts on the results of the CPD of VHS teacher using e-learning portal based interactive multimedia, has been obtained an average score at the display aspect of 3.4 , at the easily usage aspect of 3.22, the material presentation aspects of 3, 1, and the advantage aspect of 2.75. If the average score of those four aspects was calculated the score obtained was3.12, which was included in a good category.

In the validation activities carried out by material experts on the results of the CPD of VHS teacher using e-learning portal based interactive multimedia, has been obtained an average score at the material relevancy aspect of 3.35 , at technical aspect of 3.25. If the average score of those two aspects was calculated the score obtained was 3.3, which was included in a very good category.

In the validation activities carried out by teachers on the results of CPD of VHS teachers using e-learning portal based interactive multimedia, it has been obtained an average score at the display aspects was 2.9 , at the easily usage aspect was 2.83 , at the material presentation aspect was 3, the advantage aspect was 3.2 and the material relevancy aspect was 2.86. If the average score of those five aspects were calculated the score obtained was 2.99, which is in a good category. In addition if the average score achieved in the validation conducted by media experts, material experts and teachers as a whole to be averaged , the overall average score obtained was 3.14 which is in a good category.

Based on the black box testing results on the CPD of VHS teachers using e-learning portal-based interactive multimedia, it showed that each block and the whole system were obviously found to work functionally proper. Besides that matter the average score obtained from the overall validation of media experts, mateial experts and teachers, was 3,14 which is in a good category. Thus, it shows that the CPD of VHS teachers using e-learning portal-based interactive multimedia has the feasibility of good usage.

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Results of pre-test taken by the teachers before attending the trial test model implementation of CPD teachers using e-learning portal based interactive multimedia were presented in Table 3. The pretest results as shown in Table 3 above showed that: (1) the highest category was achieved by a good teacher, with the number of teachers was 1 (6.67%); (2) the pretty good score category were 3 people (20%); (3) the inadequate score category were achieved by 6 people (40%); and (4) the poor score category was obtained by 5 people (33.33%). In the average, the pre-test score achieved by teachers was 48.8, this score is in the inadequate category. Thus, it shows that the majority of teachers (73.33%) were lack or have not yet mastered the competency of classroom action research and scientific articles writing. Nevertheless, it is reasonable because the teachers have not begun learning the competency of classroom action research and scientific articles writing through CPD models using MMIB e-learning portal.

At the end of the trial test activities in implementing CPD teachers model using e-learning portal using e-learning portal based interactive multimedia, teachers were asked to take a post-test, the results were also shown in Table 3. Results of the post-test of the trial test activities in implementing CPD teachers model using e-learning portal MMIB as shown in Table 3 above, show that: (1) excellent score categories were achieved by 3 people (20%); (2) good score categories were achieved by 11 people (73.33%); and (3) Adequate score category was achieved by one person (6.67%). In the average , the post-test score achieved by the teachers was 74.93, this score was in a good category. The meaning of which that in the average, teacher has been properly mastering the competency of classroom action research and scientific articles writing. If the average teachers pre-test score of 48.8 was compared with the average teachers post-test score of 74.93, it appears that the average post-test score increased by 53.94% from the pre-test score. The meaning of which was that before attending the trial-test activities in implementing CPD teachers model using e-learning portal MMIB, the teachers have not been mastering the competency of classroom action research and scientific articles writing, but after attending those activities, they turned to well master the competency of classroom action research and scientific articles writing.

That matter was also supported by data that CAR proposal or scientific journal articles writings are done by the teachers and guided online by the tutor via "japri=personal network" on www.pkbguru.com. in the average their score achieved was 71.6 with the good classified score as shown in Table 4. Based on the average teachers post-test score achieved in the trial -test activities in implementing CPD teachers using e-learning portal using e-learning portal based interactive multimedia of 74.93, which was in a good categories, and the average score of the teachers work in the form of writing CAR proposal or scientific journal articles guided online was 71.6, which is quite good, this matter proved that CPD teachers models used e-learning portal MMIB has a good effectiveness.

4. Conclusion and Sugestion

4.1. Conclusion

4.1.1. Continuing professional development of VHS teachers using e-learning portal based interactive multimedia has a good feasibility level of implementation, this is indicated by the results of blac box testing that showed the entire system functions properly, and the average score overall validation of media expert, material experts and teachers of 3.14 which is in good category.

4.1.2. Continuing professional development of VHS teachers using e-learning portal based interactive multimedia, has a good effectiveness level of implementation, this was indicated by the average teacher post-test score achieved was 74.93 which is in a good category and the average value of the teachers work in the form of PTK proposal writing or scientific journal articles guided online of 71.6 which is in a good category.

4.2. Sugestion

In relation to the achievement of continuing professional development of VHS teachers of Electricalpower Expertise Program using e-learning portal based interactive multimedia that has a good feasibility level of implementation, and has a good effectiveness level of implementation, therefore to the teachers, especially VHS teachers with the competency of Electrical Power Utilization Installation Engineering Skills, and VHS teachers in general or other teachers, in order to immediately benefitted it by registering themselves as

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members, so they can login and can get a chance to develop CPD for themself.

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