

## MODEL INTEGRATION OF DISCOVERY LEARNING WITH CONTEXTUAL TEACHING AND LEARNING (DL-CTL MODEL) TO IMPROVE THE QUALITY OF LEARNING IN VOCATIONAL HIGH SCHOOL

Hasanah<sup>1\*</sup>, Muhammad Nasir Malik<sup>1</sup>, Elfira Makmur<sup>1</sup>

<sup>1</sup>Faculty of Engineering, Universitas Negeri Makassar

\*[hasanahunm@yahoo.com](mailto:hasanahunm@yahoo.com)

### ABSTRACT

*Objectives of this research are: (1) integrating model of Discovery Learning with Contextual Teaching and Learning on the learning of electric lighting installation, this model is called DL-CTL Model; (2) determining the level of learning activity of teachers with the application of DL-CTL Integration model in learning the electric lighting installation; (3) determining the level of learning motivation of teachers with the application of DL-CTL Integration model in learning the electric lighting installation; (4) determining the learning result achievement of teachers with application of DL-CTL integration model in learning the electric lighting installation. This study is a Quasi Experiment. The population in this study is all students of competence program of Installation Engineering of Electrical Power in Subject of Installation Engineering on electric lighting of modest building in the academic year of 2015/2016 at SMK Negeri 2 Watampone, South Sulawesi. The sample of this study is 40 students in grade XI. Sampling uses purposive sampling method. The results of the study with the application of DL-CTL model are: (1) syntax of practically DL-CTL integration model can be performed well; (2) the activity of teachers increases, (3) learning motivation of teachers increases, (4) the learning result achievements of teachers shows the percentage of graduation is 95%.*

**Keywords:** *Integration, Discovery Learning, Contextual Teaching and Learning*

### INTRODUCTION

Translation of Act No. 20 of 2003 Article 1 Paragraph (1) of the National Education System states that education is a conscious and deliberate effort to create learning atmosphere and learning process, so that teachers are actively developing their potentials to have the power of religion spiritual, self-control, personality, intelligence, noble character, as well as the skills he needs, society, nation and state. The national education system is a whole educational component elements that are interlinked in an integrated manner to achieve national education goals.

Nationally, it is imposed standards of education quality, which are called the Education National Standards (ENS). In

Article 2 paragraph 1, Government Regulation No. 19 of 2005 states that the scope of the ENS includes: (1) Content Standard; (2) Process Standard; (3) Graduates Competency Standard; (4) Teacher and Educational Personnel Standard; (5) Infrastructure Standard; (6) School Management Standard; (7) Financing Standard; (8) Education Assessment Standard.

Effective learning is a very important thing to be noticed by an educator. Integrating learning model of Discovery Learning with Contextual Teaching and Learning, is an innovation in learning for Vocational Student. The integration of this learning model is also very suitable for vocational learning, particularly the field

of electrification engineering expertise both practice and theory subjects.

Based on preliminary observations of several vocational schools in addition, in Bone regency, that the learning achievement of the average for the subject of Electrical Installations on modest building is still low, it is on average 30% of students who are able to gain learning mastery above Study Competency, it is 75, as already established in school.

Some factors causing low student achievement are: (1) The learning method used by Teachers is very monotonous. The lecture method is a method consistently used by teachers by order to explain, give examples, exercises, and homework. (2) Teachers rarely provide the opportunity for students to interact with peers or teachers in efforts to develop a concept understanding, (3) Teachers are less in motivating students, (4) Teachers are more interested in the students' correct answers without analyzing mistakes made by teachers and solution procedures. Therefore, it needs method improvement used by teachers in interacting with the students. Based on the description above, this study will integrate Discovery Learning model with Contextual Teaching and Learning to improve the quality of Electric Lighting Installation Learning in Vocational High School. Furthermore, this model is called “DL-CTL Model”.

**RESEARCH METHOD**

This study is a Quasi Experiment study. The design used in this study is Nonequivalent Control Group Design. In this design, the experimental group and the control group is not chosen randomly. The study location is at SMK Negeri 2 Watampone Bone regency, South Sulawesi Province, expertise program of Electrical Power Installation Engineering on academic year of 2015/2016. The population in this study is all students of expertise program of Electrical Power

Installation Engineering. The sample of this study is 40 students in grade XI consisting of 2 classes. Sampling uses purposive sampling method. Minimum completeness score is determined by the average score of 75 for grade XI. The study instruments are in form of questionnaires, written tests, Observation and Documentation. Data Analysis Technique correlates with product moment

Table 1. Validity Criteria

No	Interval	Category
1	$1.0 \leq x < 1.5$	Invalid
2	$1.5 \leq x < 2.5$	Invalid
3	$2.5 \leq x < 3.5$	Valid
4	$3.5 \leq x < 4$	Very Valid

Reliability Test based on Alpha Cronbach

Table 2. Instrument reliability category

Coefisien Interval	Relationship Level
<b>0.00 – 0.199</b>	Very Low
<b>0.20 – 0.399</b>	Low
<b>0.40 – 0.599</b>	Enough
<b>0.60 – 0.799</b>	Strong
<b>0.80 – 0.1000</b>	Very Strong

Table 3. Activity questionnaire categorizing

Value	Category
<b>87 – 111</b>	High
<b>62 – 86</b>	Low
<b>37 – 61</b>	Mediate

Table 4. Motivation questionnaire categorizing

Value	Category
<b>123 – 148</b>	Very High
<b>95 – 122</b>	High
<b>66 – 94</b>	Mediate
<b>37 – 65</b>	Low

**RESULTS AND DISCUSSION**

Integration of Discovery Learning with Contextual Teaching and Learning model can be conducted since both centralize learning to the students in which the students are required to think by themselves based on the concept given by

teachers. Then, the students try to find or assimilate the concept that a process of self-learning. Contextual approach occurs only when students proceed the information or new knowledge so the students are able to relate to students’ real-life.

Table 5: Syntax of DL-CTL Model Integration learning

Phase	Learning Activity	
	Teacher’s Activity	Student’s Activity
<b>Phase 1 Constructivism</b>	<ol style="list-style-type: none"> <li>1. Open learning</li> <li>2. Give apperception and motivation</li> <li>3. Explain the learning purpose</li> <li>4. Teacher directs the students so they are able to construct their knowledge and ability by themselves</li> </ol>	<ol style="list-style-type: none"> <li>1. Greet and pray</li> <li>2. Understand the learning purpose</li> <li>3. Construct their knowledge and ability by themselves</li> </ol>
<b>Phase 2 Inquiry</b>	<ol style="list-style-type: none"> <li>1. Teacher gives the material stimulation</li> <li>2. Teacher persuades the students to create problem statement</li> <li>3. Teacher presents events causing cognitive conflict and students’ anxiousness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Together with the teacher, students formulate problem identification inquiries</li> <li>2. Students gain the information as much as possible.</li> <li>3. Students collect data</li> </ol>
<b>Phase 3 Discovery Learning</b>	Teacher motivates students so they find their skills that will be learnt by themselves	Students find their knowledge and skills by themselves
<b>Phase 4 Questioning</b>	Teacher gives opportunity to the students to ask about materials they don’t understand in the learning.	Students ask the teacher about materials they don’t understand in the learning.
<b>Phase 5 Community Learning</b>	Teacher asks the students to make study groups	Students are gathered to make study groups
<b>Phase 6 Modelling</b>	Teacher provides model as the learning media	Students show examples around the school environment
<b>Phase 7 Reflection</b>	Teacher guides students to do reflection to the learning that has been conducted	Students make relationship about the subject that has been conducted with the students’ real life
<b>Phase 8 Authentic Assessment</b>	Teacher assesses the students’ study result to find out the study result of each student	Students do exercises.

**Students’ Activity**

Descriptive analysis result of students’ study activity data with the application of DL-CTL model can be seen

in Table 6. Data of frequency distribution and categorization of student’s study activity score can be seen in the following table:

Table 6. Distribution of Students’ Study Activity Score Frequency and Categorization

Category	Experiment Class		Control Class	
	Freq.	%	Freq.	%
<b>Very Active</b>	20	100	10	50
<b>Active</b>	0	0	9	45
<b>Less Active</b>	0	0	1	5
<b>Total</b>	20	100	20	100

**Students’ Study Motivation**

Descriptive analysis result of students’ study motivation data with

application of DL-CTL integration model and conventional learning can be seen in Table 7.

Table 7: Distribution of Students’ Study Motivation Score Frequency and Categorization

Category	Experiment Class		Control Class	
	Freq.	%	Freq.	%
<b>Very High</b>	18	90	2	10
<b>High</b>	2	10	18	90
<b>Moderate</b>	0	0	0	0
<b>Low</b>	0	0	0	0
<b>Total</b>	20	100	20	100

**Students’ Study Result**

Students’ study result data is obtained after performing the tests twice, pretest and posttest. According to the table, it is known that the differences in students’ study result between experimental class with control class. It is evident from the average score of students’ study result in the experimental class and control class.

The average score of pretest in the experimental class is 20.55, while in the control class is 18.75. After giving different treatment to both classes, the average score of posttest in the experimental class is 81.65 while the control class is 71.50. The data shows an average of study result in the experimental class is higher than the control class.

Table 8: Distribution of Students’ Study Result Frequency and Categorization

Category	Experimental Class				Control Class			
	Pretest		Posttest		Pretest		Posttest	
	Freq.	%	Freq.	%	Freq.	%	Freq.	%
<b>Very Good</b>	0	0	7	35	0	0	1	5
<b>Good</b>	0	0	12	60	0	0	9	45
<b>Enough</b>	0	0	1	5	0	0	9	45
<b>Less</b>	20	100	0	0	20	100	1	5
<b>Total</b>	20	100	20	100	20	100	20	100

The data have illustrated that there is a significant difference between experimental class with control class. The completeness of students in each subject based on Minimum Complete Standard

(MCS) set by the school. MCS is 75. The result of completeness analysis of posttest students in the experimental class and control class with MCS 75 can be seen in Table 9.

Table 9: Completeness Analysis of Students’ Study Result

Category	Experimental Class		Control Class	
	Freq.	%	Freq.	%
<b>Complete</b>	19	95	8	40
<b>Not Complete</b>	1	5	12	60
<b>Total</b>	20	100	20	100

Based on Table 9 above, it can be concluded that the students' study result in the experimental class is higher than the study result achieved by students in the control class.

**Hypothesis Test**

Hypothesis test used in this study is a parametric statistical tests, using independent Sample t-test. This test is used to decide whether the hypothesis is

accepted or rejected. The analysis result of t test (t-test) of activity questionnaire of students' study result can be seen in Table 4.10. The table shows that t count is 7.200 with 0.000 significance 0.000. Significant value showing  $0.000 < 0.05$  then  $H_0$  is rejected. This is also supported by the value of the average scores of students' study activity in the experimental class of 104.35 is greater than the control class of 84.60.

Table 10: Hypothesis’ Test Result of Students’ Study Activity

$\alpha$	Class	N	Average	$t_{count}$	$t_{table}$	Sig.
0.05	Experiment	20	104.350	7.200	0.444	0.000
	Control	20	84.600			

The results of the test show that there are differences in the study activities of students taught by DL-CTL learning model integration with students taught using conventional study models. The analysis results of the t test (t-test) of

students' study motivation questionnaire show that t count is 9.145 with significance of 0.000. Significant value showing  $0.000 < 0.05$ , then  $H_0$  rejected. It is also supported by the average score of the students' study motivation in the

experimental class of 131.20 is greater than the control class of 113.85. The results of the test show that there are differences in study motivation of students taught by the DL-CTL learning model integration with students taught using conventional study models.

Once the data is proved normal and homogeneous, then t test on the pretest result to determine the initial capability of students in the experimental class and control class. The analysis results of the t test show result of Sig. (2-tailed) is 0.346, which means greater than 0.05, which means far from the value of t table. Therefore, then  $H_0$  is accepted. In other words, the initial capability of students in the experimental class and control class in Electrical Engineering subject is same. Then, both classes are worth to be compared.

The analysis result of the t test of students' study result after obtaining a different treatment in the delivery of material (posttest) the t count is 4.401 with significance of 0.000. Significant value showing  $0.000 < 0.05$ , then  $H_0$  is rejected. It can also be seen from the difference in the average score obtained by students in the experimental class of 81.65 is greater than the average score obtained by students in the control class of 71.50.

The data above shows the t count is positive and greater than t table so  $H_0$  is rejected and  $H_1$  is accepted, it can be concluded that there are differences in students' study result taught with the DL-CTL model integration with students taught using conventional learning model. The analysis results show that there is the effect in the application of the DL-CTL model integration to the increase of students' study result on the subjects of electric lighting installation in the simple building in SMK Negeri 2 Watampone, Bone Regency in South Sulawesi.

## CONCLUSION AND SUGGESTION

### Conclusion

Based on the data analysis and study results above, then the study conclusions are as follows:

1. The discovery learning model integration with contextual teaching and learning (DL-CTL Model) is a learning model that effectively improves the quality of Learning in the subject of Electric Lighting Installations.
2. The discovery learning model integration with contextual teaching and learning (DL-CTL Model) is a learning model that effectively increases the activity of students in the subject of electric lighting installations.
3. The discovery learning model integration with contextual teaching and learning (DL-CTL Model) is a learning model that effectively increases the study motivation of students in the subject of electric lighting installations.
4. The achievement of students' study result with application of DL-CTL integration model with percentage of 95%, while the class without application of DL-CTL integration model of 40%.

### Suggestion

The discovery learning model integration with contextual teaching and learning (DL-CTL Model) is a learning model that effectively improves the quality of Learning in the subject of Electric Lighting Installations. Therefore, it is recommended to be used in a productive learning in vocational high school.

**DAFTAR PUSTAKA**

- Ahmadi, A., & Supriyono, W. (1991). *Psikologi Belajar*. Jakarta: Rineka Cipta.
- Alma, B., & Dkk. (2010). *Guru Profesional Menguasai Metode dan Terampil Mengajar*. Bandung: Alfabeta.
- Amri, S., & Ahmadi, I. K. (2010). *Proses Pembelajaran Kreatif dan Inovatif dalam Kelas*. Jakarta: PT. Prestasi Pustakaraya.
- Arifin, J. (1991). *Evaluasi Instruksional Prinsip Teknik Prosedur*. Bandung: Remaja Rosdakarya.
- Arikunto, S. (2006). *Prosedur Penelitian Suatu Pendekatan Praktik*. Jakarta: PT. Rineka Cipta.
- Arikunto, S. (2009). *Dasar-dasar Evaluasi Pendidikan*. Jakarta: Bumi Aksara.
- Aqib, Zainal. (2013). *Model-Model, Media, dan Strategi Pembelajaran Kontekstual (Inovatif)*. Bandung: Yrama Widya.
- Bertus, H., & Warwanto, J. (2009). *Pendidikan Religiositas Gagasan Isi dan Pelaksanaannya*. Yogyakarta: Kanisius.
- Bloom, B. S. (1979). *Taxonomi of Educational Objectives, the Classification of Educational Goals*. London: Longman Group. Ltd.
- Budiningsih, A. (2005). *Belajar dan Pembelajaran*. Jakarta: Rineka Cipta.
- Crow, L. D. (1984). *Educational Psychology, Terjemahan Drs. Kasijan*. Jawa Timur: Bina Ilmu.
- Depdikbud. (2014). *Modul Pelatihan Implementasi Kurikulum 2013 SMP Bahasa Inggris*. Jakarta: Badan Pengembangan Sumberdaya Manusia Pendidikan dan Kebudayaan dan Penjaminan Mutu Pendidikan Kementerian Pendidikan dan Kebudayaan.
- Depdiknas. (2007). *Model Pembelajaran Kontekstual 2*. Jakarta: Dirjen Dikdasmen.
- Depdiknas. (2008). *Kamus Besar Bahasa Indonesia*. Jakarta: Balai Pustaka.
- Djamarah, S. B. (1994). *Prestasi Belajar dan Kompetensi Guru*. Surabaya: Usaha Nasional Cet 1.
- Furqon. (2002). *Statistika Terapan Untuk Penelitian*. Bandung: Alfabeta.
- Gora, W., & Sunarto. (2010). *Pakematik Strategi Pembelajaran Inovatif Berbasis TIK*. Jakarta: Elex Media Komputindo.
- Hamalik, O. (2007). *Kurikulum dan Pembelajaran*. Jakarta: PT. Bumi Aksara.
- Hobri. (2009). *Metodologi Penelitian Pengembangan (Development Research)*. Jember: Proyek DIA-BERMUTU Program Pendidikan Matematika Universitas Jember.
- Ibrahim, & Dkk. (2000). *Pembelajaran Kooperatif*. Surabaya: Universitas Negeri Surabaya.
- Ibrahim, R., & S, N. S. (1996). *Perencanaan Pengajaran*. Jakarta: Rineka Cipta.
- Istiana, Galuh Arika, Agung Nugroho, dkk. *Penerapan Model Pembelajaran Discovery Learning Untuk Meningkatkan Aktivitas Belajar Pokok Bahasan Larutan Penyangga Pada Siswa Kelas XI IPA semester II SMA Negeri 1 Ngamplek Tahun Pelajaran 2013/2014*. Jurnal Pendidikan Kimia Universitas Negeri Sebelas Maret.
- Komalasari, K. (2013). *Pembelajaran Kontekstual: Konsep dan Aplikasi*. Bandung: Refika Aditama Cet. 3.
- Khotimah, Ulhaq Zuhdi. *Penerapan model pembelajaran contextual teaching and Learning (ctl) untuk meningkatkan hasil belajar siswa mata pelajaran ipa kelas i SD*. Journal. Pendidikan Guru Sekolah Dasar, Fakultas Ilmu

- Pendidikan, Universitas Negeri Surabaya.
- Kusningsih. (2014). *PENERAPAN METODE PEMBELAJARAN KOOPERATIF MODEL MAKE A MATCH DALAM PEMBELAJARAN TEMA KELUARGA Didaktikum: Jurnal Penelitian Tindakan Kelas Vol. 16, No. 2 ISSN 2087-3557*. SDN Grobog Kulon 03 Kec. Pangkah Kab. Tegal.
- Muhibbin, S. (2004). *Psikologi Pendidikan dan Pendekatan Baru*. Bandung: PT. Remaja Rosdakarya.
- Mulyasa, E. (2003). *Manajemen Berbasis Sekolah : Konsep, Strategi dan Implementasi*. Bandung: PT. Remaja Rosdakarya, Cet V.
- Muzakir, A., & Sutrisno, J. (1997). *Psikologi Pendidikan*. Bandung: Pustaka Ceria Cet 1.
- Nasution, S. (1982). *Teknologi Pendidikan*. Bandung: Jemmars, Edisi I.
- Novita, R. (2014). *Efektifitas Model Pembelajaran Kooperatif Tipe Think Pair Share (TPS) Pada Materi Trigonometri di Kelas XI IA1 SMA NEGERI 8 Banda Aceh Jurnal*.
- PLPG, M. (2014). *Model-Model Pembelajaran PAUD/TK*. Universitas Hanu Oleo.
- Poerwadarminta, W. (2003). *Kamus Umum Bahasa Indonesia*. Universitas Michigan: Balai Pustaka.
- Rahayu, W. (2015). *Model Pembelajaran Komeks: Bermuatan Nilai-nilai Pendidikan Karakter Aspek Membaca intensif di SD*. Yogyakarta: Deepublish.
- Setiawan, I. (2007). *Contextual Teaching and Learning: Menjadikan Kegiatan Belajar-Mengajar Mngasyikkan dan Bermakna, diterjemahkan dari Karya Elaine B. Johnson, Contextual and Learning: What is and why it is here to stay*. Bandung: Mizan Learning Center (MLC), Cet. 3.
- Simamora, N. R. (2008). *Buku Ajar Pendidikan dalam Keperawatan*. Jakarta: Buku Kedokteran EGC.
- Slameto. (2010). *Belajar dan Faktor-faktor yang Mempengaruhinya*. Jakarta: Bhineka Cipta.
- Solihin. (2007). *Gaul Tekno Tanpa Error*. Jakarta: Gema Insani Press.
- Sudjana, N. (1996). *Dasar-Dasar Proses Belajar Mengajar*. Bandung: Sinar Baru Algesindo.
- Sugiyono. (2009). *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta.
- Sukmadinata, & Syaodih. (2005). *Landasan Psikologi Proses Pendidikan*. Bandung: Rosdakarya.
- Supriyanto, Bambang. (2014). *Penerapan Discovery Learning Untuk Meningkatkan Hasil Belajar Siswa Kelas VI B Mata Pelajaran Matematika Pokok Bahasan Keliling Dalam Luas Lingkaran di SDN Tanggul Wetan 02 Kecamatan Tanggul Kabupaten Jember*. Jurnal.
- Suyanto, & Jihad, A. (2013). *MENJADI GURU PROFESIONAL: Strategi Meningkatkan Kualifikasi dan Kualitas Guru di Era Global*. Jakarta Timur: Erlangga.
- Usman, M. U., & Setiawati, L. (1993). *Upaya Optimalisasi Kegiatan Belajar Mengajar*. Bandung: Rosdakarya.