

**ANALISIS POLA KONSTRUKSI PENGETAHUAN SISWA
DALAM PEMBELAJARAN IPA PADA MATERI GELOMBANG
MENGGUNAKAN TBLA (*TRANSCRIPT BASED LESSON ANALYSIS*)
DI SALAH SATU SMP KOTA BANDUNG**

TESIS

Diajukan untuk Memenuhi Sebagian dari
Syarat untuk Memperoleh Gelar Master Pendidikan
Program Studi Pendidikan Ilmu Pengetahuan Alam



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**PROGRAM STUDI PENDIDIKAN ILMU PENGETAHUAN ALAM
SEKOLAH PASCASARJANA
UNIVERSITAS PENDIDIKAN INDONESIA
2019**

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Sebuah Tesis yang Diajukan untuk Memenuhi Sebagian dari Syarat
untuk Memperoleh Gelar Master Pendidikan
Departemen Pendidikan Ilmu Pengetahuan Alam

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Universitas Pendidikan Indonesia
Mei 2019

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ABSTRAK

Pendekatan konstruktivisme merupakan salah satu pembelajaran yang berpusat pada siswa dimana pengetahuan siswa merupakan hasil konstruksi siswa itu sendiri. Pandangan konstruktivisme sosial menganggap bahwa subjek individu dan bidang sosial sebagai tak terpisahkan. Tujuan dari penelitian ini adalah untuk mengungkap pola analisis konstruksi pengetahuan siswa dalam pembelajaran IPA pada materi gelombang menggunakan *Transcript Based Lesson Analysis* (TBLA). Penelitian ini melibatkan siswa dari Sekolah Menengah Pertama yang diajar oleh seorang guru IPA yang terbiasa mengikuti kegiatan *Lesson Study*. Kegiatan pembelajaran direkam audio dan video. Kemudian rekaman ditranskrip dan dianalisis. Analisis dialog terkait dengan konstruksi pengetahuan siswa dianalisis menggunakan TBLA yang membagi proses pembelajaran menjadi beberapa segmen. Hasil menunjukkan bahwa kecenderungan pola konstruksi pengetahuan siswa pada siklus 1 untuk setiap segmen pembelajaran yaitu segmen 1 (A,EL,J), segmen 2 (A,OR,EL), segmen 3 (A,I,OR), segmen 4 (A,I,AF) dan segmen 5 (A,I,AF), sedangkan kecenderungan pola konstruksi pengetahuan siswa pada siklus 2 untuk setiap segmen pembelajaran yaitu segmen 1 (A,EL,CO), segmen 2 (A,EX,EL), segmen 3 (A,EL,CO), segmen 4 (A,CO,EL), segmen 5 (Q,A,EL), segmen 6 (A,EL,CO), segmen 7 (A,OR,RE) dan segmen 8 (A,Q,EL). Selain itu terjadi pergeseran pola konstruksi pengetahuan siswa pada siklus 1 dengan kecenderungan *responsive, informative, elaborative* menjadi *responsive, elaborative, interrogative* yang terjadi pada siklus 2.

Kata kunci : Konstruktivisme Sosial, Konstruksi pengetahuan, TBLA, *Lesson Study*, Pembelajaran IPA

DAFTAR ISI

	Halaman
PERNYATAAN.....	i
ABSTRAK	ii
KATA PENGANTAR.....	iii
UCAPAN TERIMA KASIH	iv
DAFTAR ISI.....	vi
DAFTAR TABEL	viii
DAFTAR GAMBAR.....	x
DAFTAR LAMPIRAN	xii
BAB I PENDAHULUAN.....	1
A. Latar Belakang Penelitian	1
B. Rumusan Masalah Penelitian	5
C. Tujuan Penelitian.....	6
D. Manfaat Penelitian.....	6
E. Struktur Organisasi Tesis	6
BAB II KAJIAN PUSTAKA	8
A. Teori Belajar Konstruktivisme	8
B. Konstruktivisme Sosial	9
C. Teori Perkembangan Konsep Vygotsky.....	12
D. Konstruksi Pengetahuan	14
E. <i>Lesson Study</i>	18
F. TBLA (<i>Transcript Based Lesson Analysis</i>)	21
G. Analisis Materi Pembelajaran	22
BAB III METODOLOGI PENELITIAN	32
A. Desain Penelitian	32
B. Partisipan dan Tempat Penelitian	35
C. Teknik Pengumpulan Data	36
D. Analisis Data	36

BAB IV TEMUAN DAN PEMBAHASAN	41
A. Pola Konstruksi Pengetahuan Siswa pada Pembelajaran IPA.....	41
1. Karakteristik Pola Konstruksi Pengetahuan Siswa pada Siklus 1	42
2. Karakteristik Pola Konstruksi Pengetahuan Siswa pada Siklus 2	79
B. Pergeseran Pola Konstruksi Pengetahuan Siswa yang terjadi dalam Pembelajaran IPA.....	113
BAB V SIMPULAN, IMPLIKASI DAN REKOMENDASI	122
A. Simpulan.....	122
B. Implikasi.....	123
C. Rekomendasi	123
DAFTAR PUSTAKA	125
LAMPIRAN.....	131
RIWAYAT HIDUP	210

DAFTAR PUSTAKA

- Akiba, M., Wilkinson, B.(2015). Adopting an International Innovation for Teacher Professional Development: State and District Approaches to Lesson Study in Florida. *Journal of Teacher Education*, 67(1), p.74-93
- Arani, M. R. S., Fukaya, K., & Lassegard, J. P. (2010). "Lesson Study" as Professional Culture in Japanese Schools: An Historical Perspective on Elementary Classroom Practices. *Nichibunken Japan Review*, 171-200.
- Arani, M. R. S., Shibata, Y., Christine Lee, K. E., Kuno, H., Matoba, M., Lay Lean, F., & Yeo, J. (2014). Reorienting the cultural script of teaching: cross cultural analysis of a science lesson. *International Journal for Lesson and Learning Studies*, 3(3), 215-235.
- Arifin, Z. (2011). *Konsep dan model pengembangan kurikulum*. Bandung: PT Remaja Rosdakarya.
- Arvaja, M. (2007). Contextual perspective in analysing collaborative knowledge construction of two small groups in web-based discussion. *International Journal of Computer-Supported Collaborative Learning*, 2(2-3), 133-158.
- Banks. (2002). *An Introduction to Multicultural Education*. [Online]. Diakses dari <http://www.siue.edu/~ptheodo/foundations/knowledgeconstruction.html>.
- Basheer, A., Hugerat, M., Kortam, N., & Hofstein, A. (2017). The effectiveness of teachers' use of demonstrations for enhancing students' understanding of and attitudes to learning the oxidation-reduction concept. *Eurasia Journal of Mathematics, Science and Technology Education*, 13(3), 555-570.
- Boaler, J., & Brodie, K. (2004). The importance of depth and breadth in the analyses of teaching: A framework for analyzing teacher questions. In D. E. McDougall & J. A. Ross (Eds.), *Proceedings of the 26th meeting of the North American Chapter of the International Group for the Psychology of Mathematics Education* (pp. 773-782). Toronto, Canada.
- Cobb, P. (1994). Where is the mind? Constructivist and sociocultural perspectives on mathematical development. *Educational researcher*, 23(7), 13-20.
- Conceição, S. C., Desnoyers, C. A., & Baldor, M. J. (2008). Individual construction of knowledge in an online community through concept maps. In *Proc. Of The Third Int. Conference On Concept Mapping, Tallinn, Estonia & Helsinki, Finland*.
- Disessa, A. A., & Sherin, B. L. (1998). What changes in conceptual change?. *International journal of science education*, 20(10), 1155-1191.

- Duschl, R. A., & Osborne, J. (2002). Supporting and promoting argumentation discourse in science education.
- Elliott, J. (2016). Significant themes in developing the theory and practice of lesson study. *International Journal for Lesson and Learning Studies*, 5(4), 274-280.
- Ertl, B., Reiserer, M., & Mandl, H. (2005). Fostering collaborative learning in videoconferencing: The influence of content schemes and collaboration scripts on collaboration outcomes and individual learning outcomes. *Education, Communication & Information*, 5(2), 147-166.
- Eshach, H. (2010). An analysis of conceptual flow patterns and structures in the physics classroom. *International Journal of Science Education*, 32(4), 451-477.
- Fernández, M. L. (2005). Learning through microteaching lesson study in teacher preparation. *Action in Teacher Education*, 26(4), 37-47.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2011). *How to design and evaluate research in education*. New York: McGraw-Hill Humanities/Social Sciences/Languages.
- Giancoli, D. C. (2001). Fisika edisi kelima jilid 1. Jakarta: Erlangga.
- Gredler, M. E., & Shields, C. C. (2008). *Vygotsky's legacy: A foundation for research and practice*. Guilford Press.
- Halliday, D., Walker, J., & Resnick, R. (2013). *Fundamentals of physics*. John Wiley & Sons.
- Hendayana, S., & Hidayat, A. (2013). Developing tools for analyzing of classroom interaction: Does it student-centered or teacher-centered lesson. Bandung: PPT Seminar international MSCEIS. UPI.
- Hendayana, S., Sukirman, S., & Karim, M. A. (2007). Studi dan Peran IMSTEP dalam Penguatan Program Pendidikan Guru MIPA di Indonesia. *Educationist*, 1(1), pp-28.
- Hofstein, A., & Lunetta, V.N. (2004). The laboratory in science education: foundations for the twenty-first century. *Sci. Educ*, 8, 28-54.
- IGI. (2010). What is Knowledge Construction. [Online]. Diakses dari <https://www.igi-global.com/dictionary/knowledge-construction/16299>.
- Johnstone, A.H., & Al-Shuaile, A. (2001). Learning in the laboratory: Some thoughts from the literature. *Journal of U.Chem.Ed*, 5, 42-51

- Kumpulainen, K., & Mutanen, M. (1999). The situated dynamics of peer group interaction: An introduction to an analytic framework. *Learning and instruction*, 9(5), 449-473.
- Lewis, C. C., Perry, R. R., & Hurd, J. (2009). Improving mathematics instruction through lesson study: A theoretical model and North American case. *Journal of mathematics teacher education*, 12(4), 285-304.
- Lewis, C., Perry, R., Foster, D., Hurd, J., & Fisher, L. (2011). Lesson Study: Beyond Coaching. *Educational Leadership*, 69(2), 64-68.
- Lewis, C. C., Perry, R. R., Friedkin, S., Roth, J. R. (2012). Improving Teaching Does Improve Teachers: Evidence from Lesson Study. *American Association of Colleges for Teacher Education*, 63, p.365-375.
- Moore, F. M. (2007). Language in science education as a gatekeeper to learning, teaching, and professional development. *Journal of Science Teacher Education*, 18(2), 319-343.
- Novak, J. D. (2002). Meaningful learning: The essential factor for conceptual change in limited or inappropriate propositional hierarchies leading to empowerment of learners. *Science education*, 86(4), 548-571.
- Osborne, R. J., & Wittrock, M. C. (1983). Learning science: A generative process. *Science education*, 67(4), 489-508.
- Pope, M., & Gilbert, J. (1983). Personal experience and the construction of knowledge in science. *Science education*, 67(2), 193-204.
- Pratiwi, P.R. dkk. (2008). *CTL Ilmu Pengetahuan Alam SMP Kelas VIII*. Jakarta: Depdiknas.
- Rahman, S., Yasin, R. M., Jusoff, K., Yassin, S. F. M., Nordin, N. M., & Yusof, M. M. (2011). Knowledge construction process in online learning. *Middle East Journal of Scientific Research*, 8(2), 488-492.
- Rahmawati, I. F., & Wulyani, A. N. (2013). AUTONOMOUS LEARNING IN READING CLASS: BUILDING THE STUDENTS'INDEPENDENT CHARACTER. *Bahasa dan Seni: Jurnal Bahasa, Sastra, Seni, dan Pengajarannya*, 41(1).
- Reiner, M., Slotta, J. D., Chi, M. T., & Resnick, L. B. (2000). Naive physics reasoning: A commitment to substance-based conceptions. *Cognition and instruction*, 18(1), 1-34.
- Reiser, B. J. (2004). Scaffolding complex learning: The mechanisms of structuring and problematizing student work. *The Journal of the Learning sciences*, 13(3), 273-304.

- Romagnano, L., Evans, B., & Gilmore, D. (2008). Using video cases to engage prospective secondary mathematics teachers in lesson analysis. *Cases in mathematics teacher education: Tools for developing knowledge needed for teaching (AMTE Monograph 4)*, 103-115.
- Roosevelt, F. D. (2008). Zone of proximal development. *Encyclopedia of educational psychology*.
- Rusman. (2010). *Model-model Pembelajaran Mengembangkan Profesionalisme Guru*, Jakarta: PT Raja Grafindo
- Saito, S., Kotera, K., Shigematsu, N., Ide, A., Sugimoto, N., Horii, Z., ... & Tamura, Y. (1963). Structure of securinine. *Tetrahedron*, 19(12), 2085-2099.
- Sarkar Arani, M. R. (2017). Raising the quality of teaching through Kyouzai Kenkyuu—the study of teaching materials. *International Journal for Lesson and Learning Studies*, 6(1), 10-26.
- Satagata dan Angelici (2010). “Studying the Impact of the Lesson Analysis Framework on Preservice Teachers’ Ability to Reflect on Videos of Classroom Teaching”. *Journal of teacher education*. 61, (4), 339-349.
- Schwarz, B., Dreyfus, T., Hadas, N., & Hershkowitz, R. (2004). Teacher Guidance of Knowledge Construction. *International Group for the Psychology of Mathematics Education*.
- Scott, P. H., Mortimer, E. F., & Aguiar, O. G. (2006). The tension between authoritative and dialogic discourse: A fundamental characteristic of meaning making interactions in high school science lessons. *Science education*, 90(4), 605-631.
- Slavin, R. E. (1980). Cooperative learning. *Review of educational research*, 50(2), 315-342.
- Smirnova, Z. V., Gruzdeva, M. L., Chaykina, Z. V., Terekhina, O. S., Tolsteneva, A. A., & Frolova, N. H. (2016). The role of students' classroom independent work in higher educational institutions. *Indian Journal of Science and Technology*, 9(22), 95568-95568.
- Stahl, G. (2004). Building collaborative knowing. In *What we know about CSCL* (pp. 53-85). Springer, Dordrecht.
- Stanny, C. (2016). Reevaluating Bloom’s taxonomy: What measurable verbs can and cannot say about student learning. *Education Sciences*, 6(4), 37.
- Sugiyono, P. (2015). Metode penelitian kombinasi (mixed methods). *Bandung: Alfabeta*.

- Sukirman. 2006. *Peningkatan Keprofesionalan Guru Melalui Lesson Study. Makalah disajikan dalam Pelatihan Lesson Study Bagi Guru Berprestasi dan MGMP MIPA SMP Seluruh Indonesia*, Yogyakarta, 26 November-10 desember 2006.
- Taber, K. S. (2008). Exploring conceptual integration in student thinking: Evidence from a case study. *International Journal of Science Education*, 30(14), 1915-1943.
- Tipler, P. A. (1991). FISIKA untuk Sains dan Teknik. *Jakarta: Erlangga*, 1(2), 3.
- Vallealla, U. M. (2006). Shared Understanding in Education an Work: Context of Understanding in Student Group and Work Team Discussion. *Psychology and Social Research*, 8(2), 10-21
- Van de Grift, W. (2007). Quality of teaching in four European countries: A review of the literature and application of an assessment instrument. *Educational research*, 49(2), 127-152.
- Van de Pol, J., Volman, M., & Beishuizen, J. (2010). Scaffolding in teacher-student interaction: A decade of research. *Educational psychology review*, 22(3), 271-296.
- Von Glaserfeld, E. (2001). The radical constructivist view of science. *Foundations of science*, 6(1-3), 31-43.
- Vosniadou, S., Ioannides, C., Dimitrakopoulou, A., & Papademetriou, E. (2001). Designing learning environments to promote conceptual change in science. *Learning and instruction*, 11(4-5), 381-419
- Vygotsky, L. (1978). Zone of proximal development. *Mind in society: The development of higher psychological processes*, 5291, 157.
- Vygotsky, L. S. (1986). Thought and language-Revised edition.
- Vygotsky, L. S. (1999). Tool and sign in the development of the child. *The collected works of LS Vygotsky*, 6, 3-68.
- Wandersee, J. H. (1990). Concept mapping and the cartography of cognition. *Journal of research in science teaching*, 27(10), 923-936.

- Windschitl, M., Thompson, J., Braaten, M., & Stroupe, D. (2012). Proposing a core set of instructional practices and tools for teachers of science. *Science education*, 96(5), 878-903.
- Woolfolk, A. (2008). *Educational Psychology. 10th Edition*. New Jersey: Allyn and Bacon.
- Zee, E. H. V., & Minstrell, J. (1997). Reflective discourse: Developing shared understandings in a physics classroom. *International Journal of Science Education*, 19(2), 209-228.