BIBLIOGRAPHY

Abdelhaleem, I. H. (2002)**.** Examining the impact of the guided constructivist teaching method on students' misconceptions about concepts of Newtonian Physics. (Doctoral Dissertation, University of Central Florida, 2002). *Dissertation Abstract International*, (62)10, 3338A.

Abimbola, I. O. (1988). The problem of terminology in the study of student's conceptions in science. *Science Education*, 72(2), 175-184.

Adinarayana, K. (1984). *Science teaching in primary schools training programme.* An unpublished Doctoral thesis. University College of Education Madurai. In Buch, M.B (Ed.) *Fourth Survey of Research in Education.*

Agarkar, S. C. (2019). Influence of Learning Theories on Science Education. *Resonance*. DOI: https://doi.org/10.1007/s12045-019-0848-7.

Akhilesh, P. T. (2014). *Identification of Misconceptions in Physics and Testing of Effectiveness of Certain Instructional Programmes on Remediation of Misconcepts Among VIII Standard Students in Kerala. (Unpublished Ph. D thesis)*, University of Calicut, Kerala.

Allen, M. (2014). *Misconceptions in Primary Science*. Berkshire: Open University Press.

Alvermann, D. E., Smith, L. C., & Readence, J. E. (1985). Prior Knowledge activation and the comprehension of compatible and in compatible test. *Reading Research Quarterly*, 20, 420-436.

American Association for the Advancement of Science [AAAS]. (1990). *Science for all Americans*. New York: Oxford University Press.

American Association for the Advancement of Science [AAAS]. (1993). *Benchmarks for science literacy*: Retrieved from *http://www.project2061.org/publications/ bsl/online/index.php.*

American Association for the Advancement of Science. (1968). *Science: A Process Approach.* Washington.

Amir, R & Tamir, P. (1990). Detailed analysis of misconceptions as a basis for developing remedial instruction: The case of photosynthesis, *Paper presented at the Annual meeting of American Educational Research Association*, Boston.

Anjarsari, P. (2018). The common science misconceptions in Indonesia junior high school students. *Journal of Science Education Research,* 2(1), 21-24.

Anne, M. J. (1999). Investigating teachers' understanding and diagnosis of students' preconceptions in the secondary classroom. . (Doctoral Dissertation, Oregon State University, 1999). *Dissertation Abstract International,* (60)6, 1968A.

Ansari, A. B. (1998). A study of misconceptions concerning genetics and evolution in biology at high school level in relation to formal reasoning ability, cognitive style and achievement. In Krishna Kumar (Ed.), *Sixth survey of Educational Research, Vol. I* (p. 81). New Delhi : NCERT.

Barke, H. D. (2012), Two Ideas of the Redox Reaction : Misconceptions and Their Challenge in Chemistry Education. *African Journal of Chemical Education,* 2, 32-50.

Barrass, Robert (1984). Some misconceptions and misunderstandings perpetuated by teachers and text books of biology. *Journal of Biological Education,* 18, 201 -205.

Baweja, M. (2008). *A study of errors and misconceptions in science at secondary school stage.* (Unpublished Ph.D Thesis). Punjab University: Chandigarh.

Bayrak, B. K, (2013). Using Two-Tier Test to Identify Primary Students' Conceptual Understanding and Alternative Conceptions in Acid Base. *Mevlana International Journal of Education (MIJE),* 3(2), 19-26.

Bayuni, T. C., Sopandi, W. & Sujana A. (2018). *Identification Misconception of Primary School Teacher Education Students' in changes of matter using five tier-diagnostic test.* 4th International Seminar of Mathematics, Science and Computer Science Education. Doi:10.1088/1742-6596/1013/1/012086.

Beer, C. P. (2010). How do pre-service teachers picture various phenomenon? A qualitative study of pre-service teachers' conceptual understanding of fundamental electromagnetic interaction. (Doctoral Dissertation, Ball State University, 2010). *Dissertation Abstract International,* (72)3, 890A.

Bell, B. (1985). Student's idea about plant nutrition : What are they? *Journal of Biological Education,* 19, 213-218.

Bentley. M. L and Ebert. E. S. (2007) *Teaching constructivist Science, Nurturing Natural Investigators in the Standards- Based Classroom.* Published by Corvin Press: A SAGE Publications Company: New Delhi, India.

Berthalsen, B. (1999). *Students' native conceptions in life science.* Retrieved from:http//gamstcweb.gisd.k12.mi.us

Berthelsen, K. V. (1993). *A Study on the Relation Between Concepts of Physical Science and Life Science.* Oregon State University: Thailand.

Best, J. W. & Kahn, J. V. (2009). *Research in Education.* New Delhi: Prentice Hall of India Pvt. Ltd.

Bethard, S. et al. (2006). *Identifying Science Concepts and Student's Misconceptions in an Interactive Essay Writing Tutor.* The 7th workshop on the innovative use of NPL for building educational applications, 12-21.

Betkouski, M. B. (1987). *Meaningful learning in elementary science*. Dubuque, IA: Kendall/Hunt.

Blumenfeld, P. C., Soloway, E., Marks, R., Krajick, J., Guzdial, M., & Palinesar, A. (1991). Motivating Project-based Learning: Sustaining the Doing, Supporting the Learning. *Educational Psychologists,* (26)3&4.

Bodner, G. M. (1986). Constructivism: A Theory of Knowledge. *Journal of Chemical Education,* 63, 873-877. http://dx.doi.org/10.1021/ed063p873

Bradley, J. D. & Mosimege, M. D. (1998). Misconceptions in Acids and Bases: A Comparative Study of Student Teachers with Different Chemistry Backgrounds. *South African Journal of Chemistry,* 9, 137-145.

Bronowski, J. (1956). *Science and Human Values.* New York: Harper and Row.

Brumby, M. N. (1984). Misconceptions about the concept of natural selection by medical biology students. *Science Education,* 68(4), 493-503.

Butts, R. E. & Brown, J. R. (1989). Constructivism and Science: Essays in Recent German Philosophy. New York: Springer.

Canpolat, N. (2006). Turkish undergraduates' misconceptions of evaporation, evaporation rate and vapour pressure. *International Journal of Science Education,* 23, 1757-1770.

Cardak, O. (2009). Science students' misconceptions about birds. *Scientific Research and Essay,* 4(12), 5018-5022.

Carey, S. (1985). *Conceptual change in childhood.* Canbridge. MA: MIT Press.

Carey, S. (1991). Knowledge acquisition: Knowledge enrichment or conceptual change? In S.Carey & R. Gelman (Eds.), *The epigenesist of the mind: Essays on biology and cognition* (pp. 257-292). Mahwah, NJ: Erlbaum.

Carey, S. (2000) Science education as conceptual change. *Journal of Applied Development Psychology*, 21, 13-19. Doi: 10.1016/A01933973(99)00046-5

Census of India. (2011). *Census of Ranchi District.* Retrieved November 04, 2015 from https://censusindia.gov.in

Cepeda, L. F. (2010). Effects of participation in inquiry science workshops and follow-up activities on middle school science teachers' content knowledge, teacher held misconceptions and classroom practices. (Doctoral Dissertation, University of Denver, 2010). *Dissertation Abstract International,* (70)12, 4628A.

Chandrasegaran, A. L., Treagust, D. F. & Mocerino, M. (2008). An evaluation of a teaching intervention to promote students' ability to use multiple levels of representation when describing and explaining chemical reactions, *Research in Science Education*, 38(2), 237- 248.

Charlesworth, L. (1995). Misconceptions in physics and biological science of the upper secondary school students. (Unpublished Ph.D. thesis). Chulalongkorn University, Thailand.

Cho, H. H., Kahle, J. B., & Nordland, F. H. (1985). An investigation of high school biology text books as sources of misconceptions and difficulties in genetics and some suggestions for teaching genetics, *Science Education*, 69(5), 707-719.

Cho, J. (1988). *An investigation into fifth and eighth grade Korean students' misconceptions of photosynthesis* (Unpublished Ph.D thesis). Ohio University: Ohio.

Clement, J. (1982). Algebra word problem solutions: Analysis of a common misconception. *Journal of Research in Mathematics Education,* 13, 16-30.

Clement, J. (1982). Students' preconcepts in introductory mechanics. *American Journal Physicans*, 50(1), 66-71.

Columbia University Press. (1974). *Columbia Encyclopedia.* New York: Author.

Conant, J. (1951). *Science and Common Sense*. New York: Holt Rinerhard and Winston.

Cresswell, J. W. (1994). *Research Design: Qualitative and Quantitative Approach.* California: SAGE Publications, Inc.

Cynthia, M. M. (2011). Development and application of an instrument to identify students' misconceptions: Diffusion and Osmosis. (Doctoral Dissertation, University of Illinoi, 2011). *Dissertation Abstract International,* (71) 8. p. 2833A.

De, A. & Dreze, J. (1998). *Public Report on Basic Education in India.* New Delhi: Oxford University Press.

De, A., Khera, R., Samson, M. & Kumar, A. K. S. (2006). *PROBE Revisited.* New Delhi:Oxford University Press.

Demirci, N. (2005). A study about student's misconceptions in force and motion concepts by incorporating a web-assisted physics program. *The Turkish Online Journal of Educational Technology*, 4(3), 40-48.

Derya, K. G., Eryilmaz, A., & McDermott, C. L. (2016). Identifying pre-service physics teachers' misconceptions and conceptual difficulties about geometrical optics. *European Journal of Physics*, 37(4), 1-31.

Deshmukh, N. D. (2012). *A study of students' misconceptions in biology at the secondary school level.* (Unpublished Ph.D Thesis). Homi Bhaba Centre for Science Education. Mumbai: TIFR.

Deshmukh, N. D. (2015). Why Do School Students Have Misconceptions About Life Processes? *In: Gnanamalar Sarojini Daniel E. (eds) Biology Education and Research in a Changing Planet*, Singapore: Springer.

Dharan, N. S. (2015). *Identification and Remediation of Misconceptions about Chemical Kinetics Among Secondary School Students. (Unpublished Ph.D Thesis)*, School of Pedagogical Sciences, Mahatma Gandhi University, Kottayam, Kerala.

Diakidoy, I. N., & Kendeou, P. (2001). Facilitating conceptual change in astronomy: A comparision of the effectiveness of two instructional approaches. *Learning and Instruction*, 11, 1-20.

Diakidoy, I. N., Vosniadou, S., & Hawks, J. D. (1997). Conceptual change in astronomy: models of earth and the day/night cycle in American Indian children. *European Journal of Psychology of Education*, 12, 159-184.

Don, C. G. (2011). Exploring American Indian students' perceptions, attitudes and misconceptions of scientists and the nature of science. (Doctoral Dissertation, University of Oklahoma, 2011). *Dissertation Abstract International*, (72)6, 1947A.

Doran, R. L. (1972). Misconceptions of selected science concepts held by elementary school students. *Journal of Research in Science Teaching*, 9(2), 127-137.

Douglas, S. P. & Rao, G. S. (1997). A diagnostic study of the common errors committed by students in writing and solving of chemical equations. In Krishna Kumar (Ed.), *Sixth survey of Educational Research, Vol. I* (p. 81). New Delhi: NCERT.

Dreyfus, A. & Jungwirth, E. (1989). The pupil and the living cell: A taxonomy of dysfunctional ideas about abstract idea, *Journal of biological Education,* 23(1), 49-55.

Driver, R., & Oldham, V. (1986). A constructivist approach to curriculum development in science. *Studies in Science Education,* 13, 105-122.

Duit, R. (1987). Research on students' alternative frameworks in science topics, theoretical framework, consequences for science teaching. *In J. D. Novak (Ed.), Proceedings of the Second International Seminar of Misconceptions and Educational Strategies in Science and Mathematics,* Vol. 1 (pp. 151-162). Ithaca, NY: Cornell University.

Duit, R., & Treagust, D. F. (1995). Conceptual Change: A powerful framework for improving science teaching and learning. *International Journal of Science Education,* 25, 671-688. Doi: 10.1080/09500690305016

Eaton, J. F., Anderson, C. W. & Smith, E. L. (1984). Student's Misconceptions Interfere with Science Learning: Case Studies of Fifth Grade Students. *The Elementary School Journal,* 84(4), 365-379.

Elanie, A. P. (2007). Evaluation of model for confronting science content misconceptions: A case study report. (Doctoral Dissertation, University of Iowa, 2007). *Dissertation Abstract International.* (67)7, 2515A.

Elizabeth, B. A. (1988). A comparison of the effectiveness of demonstrations, verbal statements and hands-on experience on correcting the misconceptions of the first graders regarding magnets. (Doctoral Dissertation, Peabody College for Teacher of Vanderbilt University, 1994). *Dissertation Abstract International,* (55)6, 1519A.

Engel Clough, E. & Driver, R. (1986). A study of consistency in the use of students' conceptual frameworks across different task contexts. *Science Education,* 70(4), 473-496.

Enger, & Yager. (1998). In Bentley, M. L., Ebert II, E. S., & Ebert, C. *Teaching Constructivist Science K-8.* London: Sage Publications Ltd.

Enger, S. K, & Yager, R. E. (2001). *Assessing Students Understanding in Science:* A standard Based K 12 Handbook. New Delhi: SAGE Publication Company.

Eryilmaz, A & Surmeli, E. (2002). *Identifying students' misconception on heat and temperature through three tier questions.* Paper presented at the 5th National Conference on Science and Mathematics Education, on line, http://www.fedu.metu.edu.tr/ ufbmek5/b_kitabi/pdf/fizik/bildiri/t110dd.pdf.

Fensham, J. 0. (1982). Superstition and science teaching. *School Science and Mathematics,* 30(3), 277-282.

Fischer, K. M. (1985). A misconception in biology: amino acids and translation. *Journal of Research in Science Teaching*, 22(1), 53-62.

Fitzpatrick, F. C. (1960). *Policies for science education.* Bureau of Publications, Columbia University: New York.

Fowler, T. W., & Jaoude, D. B. (1987). *Using hierarchical concept/proposition maps to plan instruction that addresses existing and potential student misunderstandings in science* (Unpublished Ph.D thesis). Cornell University, New York.

Fredette, N. & Clement, J.J. (1981). Student misconceptions of an electric circuit: what do they mean? *Journal of College Science Teaching*, 10, 280-285.

Fuchs, T. T., & Arsenault, M. (2017). Using Test Data to Find Misconceptions in Science. *SSR,* 98(364), 31-36.

Fuller, J. A. (1994). The effect of concept mapping on misconceptions about light in fifth graders. (Doctoral Dissertation, University of Maryland college Park, 1988). *Dissertation Abstract International,* (48)9, 2301A.

Gardner, P.L. (1975). Attitudes of Science: A review. Studies in Science Education, 2, 1-41.

Garnett, P. & Stavy, R. (1992). Conceptual difficulties experienced by senior high school students of electrochemistry: electrochemical (galvanic) and electrolytic cells. *Journal of Research in Science Teaching,* 29(10), 1079-1099.

Gilbert, J. K. (1982). Concepts, misconceptions and alternative concepts: Changing perspective in science education. *Studies in Science Education,* 10, 61-98.

Glavin, E., Simmie, M. G., & Grady, O. A. (2015). Identification of Misconceptions in the Teaching of Biology: A Pedagogical Cycle of Recognition, Reduction and Removal. *Higher Education of Social Science*, 8(2), 1-8.

Government of India. (2008). *National Knowledge Commission Report to the Nation 2008.* New Delhi: Author.

Graham, G. R. (2003). The effect of student-centred and teacher-centred with and without conceptual advocacy (CA) on biology students' misconceptions (MIS), achievement (ACH), attitudes towards science (ATS) and cognitive retention (CR). (Doctoral

Dissertation, Florida Institute of Technology, 2003). *Dissertation Abstract International*, (63)10, 3510A.

Gray, P. A. (2007). Gender differences in science misconceptions in eighth grade astronomy. (Doctoral Dissertation, Widener University, 2007). *Dissertation Abstract International*, (68)3, 937A.

Griffiths, A. K., & Preston, K. R. (1992). Grade-12 students' misconceptions relating to fundamental characteristics of Atoms and molecules. *Journal of Research in Science Teaching*, 29(4), 611-620.

Gronlund, N. E., (1988). *How to Construct Achievement Tests:* Englewood Cliffs, NJ: Prentice Hall.

Guest, G. (2003). *Alternative Frameworks and Misconceptions Primary in science.* Retrieved from http://www.ase.org.uk/scitutors/professional_issues/teaching_teaching/misconceptions.php

Gunstone, R. F., Fensham, P., & White, R. T. (1994). *The Content of Science: A Constructivist Approach to its Teachings and Learnings.* London: Falmer Press.

Haki, Pesman. (2005). *Development of a three tier test to assess ninth grade students' misconceptions about simple electric circuits.* (Unpublished M.Sc Dissertation). Middle East Technical University.

Hala, Y., Syahdan, U. A., Pagarra, H., & Saenab, S. (2018). Identification of misconceptions on Cell Concepts among Biology teachers by using CRI method. *IOP Conference Series: Journal of Physics:Conference Series* ***1028*** *(2018) 012025* doi :10.1088/1742-6596/1028/1/012025

Halim, A. S., Solaire, A. Finkenstaedt-Quinn, & Ginger, V. S. (2018). Identifying and Remediating Student Misconceptions in Introductory Biology via Writing-to-Learn Assignments and Peer Review. *CBE Life Sciences Education.*

Halloun, I. & Hestenes, D. (1985). The Initial Knowledge State of College Physics Student. *American Journal of Physics,* 53(11):1043-1055 DOI:10.1119/1.14030

Hardt, E. and Paula V. (1997). Examining student's understanding of electrical circuits through multiple choice testing and interview. *Dissertation Abstracts International*, 58(6), 2141-A.

Hasiloglu, M. A. & Eminoglu, S. (2017). Identifying Cell-related Misconceptions among Fifth Graders and Removing Misconceptions Using a Microscope. *Universal Journal of Education Research,* 5(12B), 42-50.

Haslam, F., & Treagust, D. F. (1987). Diagnosing secondary students' misconceptions of photosynthesis & respiration in plants using a two-tier multiple choice instrument. *Journal of Biological Education,* 21(3), 203-11.

Helm, H. &, Novak, J. D. (1983). *Proceedings of the International Seminar on Misconceptions.* Ithaca, NY: Comell University.

Heng, C., & Karpudewan, M. (2017). Felicitating Primary School Students' Understanding of Water Cycle Through Guided Inquiry Based Learning. *Overcoming Students Misconceptions in Science.* Springer

Henriques, L. (2000). Children's misconceptions about weather. *National Association of Research in Science Teaching,* 29(4), 631-637.

Hill, G. D. (1997). Conceptual change through the use of student generated analogies of photosynthesis and respiration by college non science majors, *Dissertation Abstracts International*, 58(6), 242-A.

Hoshangabad Science Teaching Project (1977). *Science Today, 12.*

Howe, C. (2015). Misconceptions, Intuitions and Elementary Physics: Harnessing Everyday Understanding in Learning Environmental Design. *Disciplinary Intuitions and the Design of Learning Environments,* 12(2), 185-197. Doi:10.1007/978-981-287-182-4_14.

Hurd, P. D. (1971). *An Overview of Science Education in the United States and Selected Foreign Countries.* National Institution of Education: Washington DC.

Ilyas, A. & Saeed, M. (2018). Exploring Teachers' Understanding about Misconceptions of Secondary Grade Chemistry Students. *International Journal of Cross-DisciplinarySubjects in Education (IJCDSE, 9(1), 3323-3328*

India Science Report (2004). *In Ramesh, M. (2014). Acquisition of science process skills through experiential learning in students of Std. VIII (Unpublished Ph.D thesis).* CASE, The Maharaja Sayajirao University Of Baroda: Vadodara.

Indian Education Commission (1882-*83). In J. C. Aggarwal (2010). Landmarks in the History of Modern Indian Education.* S. Chand Publishing House: New Delhi.

Indian National Science Academy (2002). Retrieved from https://insaindia.res.in/?page_id=1033

Inhelder, B., & Piaget, J. (1958). The Growth of Logical Thinking: From Childhood To Adolescence. (A. Parsons & S. Milgram, Trans.). Basic Books. https://doi.org/10.1037/10034-000

Irwansyah., Sukarmin., & Harjana. (2018). Analysis Profile of Student's Misconceptions on The Concept of Fluid Based Instrument Three-Tier Test. *IOP Conference Series:Journal of Physics:Confeence Series 1097(2018)012020*, doi:10.1088/1742-6596/1097/1/012020

James, S. K. (1989). Misconceptions in the Earth and Space Sciences. (Doctoral Dissertation, Loyola University of Chicago, 1989). *Dissertation Abstract International.* (50)4, 915A.

Jhonson, B and Christensen, L. (2008). E*ducational Research (3rd Edition) Qualitative, Quantitative and mixed Method Approaches.* New Delhi, SAGE Publications.

Johnstone, A. H. (2000). Teaching of Chemistry-Logical or Psychological? *Chemistry Education: Research and Practice in Europe*, 1(1), 9-15.

Kambouri, M. (2010). *Teachers and Children's Misconceptions in Science.* Paper presented at the British Educational Research Association Annual Conference. University of Warwick.

Karpudewan, M., Narulazam, A., Zain, M. & Chandrasegaran, A. L. (2017). *Overcoming Students' Misconceptions in Science,* Singapore: Springer.

Kathleen, M. (1994). The development and validation of a categorization of misconceptions in the learning of chemistry. (Doctoral Dissertation, University of Massachusetts-Lowell, 1994). *Dissertation Abstract International*, (55)4, 923A.

Keeley, P. (2008). *Uncovering students ideas in science.* New York: NSTA Press.

Kendeou, P. & Broek, P. V. (2005)**.** The effects of readers' misconceptions on comprehension of scientific text. *Journal of Educational Psychology*, 97(2), 235-245.

Kesidou, S. & Duit, R. (1993). Students' conceptions of the second law of thermodynamics- an interpretive study. *Journal of Research in Science Teaching*, 30, 85-106.

Khalwania, N. S. (1986). Effectiveness of concept based Science Curriculum in developing cognitive structures and acquisition of process skills among high school students. (An unpublished Ph.D thesis). CASE, M.S University of Baroda: Vadodara.

Khandagale, V. S, & Chavan, R. (2017). Identification of misconceptions for gravity, moon and inertia among secondary students. *Aayushi International Interdisciplinary Research Journal (AIIRJ)*, 4(9), 197-205.

Khare, P. (2009). *The study of Problems faced by teachers in teaching science and technology at schools of Vadodara city*. (An unpublished Ph.D thesis). CASE, M.S University of Baroda: Vadodara.

King, C. J. H. (2009). An Analysis of Misconceptions in Science Textbooks: Earth science in England and Wales. *International Journal of Science Education,* 32(5), 565-601.

Klymkowsky, M. W. & Gravin-Doxas, K. (2008).Recognizing student misconceptions through Ed's tools and the biology concept inventory. *PLOS Biol,* 6(1)i. Doi:10.1371/joumalpbio.0060003.

Koomson, C. K., & Fordjour, O. (2018). Misconceptions of Senior High School Students on Evaporation and Water Cycle. *European Journal of Research and Reflection in Educational Sciences, 6(5) pg 13-28.*

Kucukozer, H. & Kocakulah, S. (2007). Secondary school students' misconceptions about simple electric circuits, *Journal of Turkish Science Education*, 4(1).

Kumandas, B., & Ateskan, A. (2018). Misconceptions in Biology: A meta-synthesis study of research, 2000-2004. *Journal of Biological Science*, doi: 10.1080/00219266.2018.1490798.

Kutluay, Y. (2005). *Diagnostics of eleventh grade students' misconceptions about geometric optic by a three tier test.* (Unpublished M.Sc Dissertation). Department of secondary Science and Mathematics Education: Middle East Technical University.

Ladage, S. (1995). Identifying students' misconceptions and learning barriers in chemistry and designing and evaluating appropriate remedial measures. In Krishna Kumar (Ed.), *Sixth survey of Educational Research, Vol. I* (p. 81). New Delhi: NCERT.

Lamichhane, R., Reck, C., & Adam, V. (2018). Undergraduate chemistry students' misconceptions about reaction coordinate diagrams. *Chemistry Education Research and Practice*, 19(3), 834-845.

Lederman, J. S. & Lederman, N. G. (2014). Research on Science Teacher Education: Myths and Misconceptions. *The Association for Science Teacher Education,* 24(1), 1-4.

Lederman, N.G. (1992). Students' and teachers' conceptions of the nature of science: A review of the research. *Journal of Research in Science Teaching, 29*, 331–359.

Leher, R., & Littlefield, J. (1991). Misconceptions and Errors in LOGO: The Role of Instruction. *Journal of Educational Psychology*, 83(1), 124-133.

Lemma, A. (2013). A diagnostic assessment of eighth grade students' and their teachers' misconceptions about basic chemical concepts. *African Journal of Chemical Education,* 3(1), 39-59.

Levenson, E. (1994). *Teaching children about life and earth sciences.* New York: McGraw-Hill.

Lin, S. W. (2004). Development and application of a two tier diagnostic test for high school students' understanding of flowering plant growth and development. *International Journal of Science Mathematics Education,* 2(2), 175-199.

Longden, B. (1982). Genetics - are there inherent learning difficulties? *Journal of Biological Education*, 16(2), 135-40.

Macaulay's Minute on Education (1835). *In J. C. Aggarwal (2010). Landmarks in the History of Modern Indian Education.* S. Chand Publishing House: New Delhi.

Mahapatra, J. K. (1989). Four dimensions of the teaching learning of science: characteristics and implication. *Indian Educational Review*, 24(3), 1-17.

Maitra, K. &, Maitra, A. (1997). To explore the attitudes towards laboratories and other related practical work in science. *School Science.* 24(2). P.44-51

Malhotra, V. K. (1998). *A critical study of the existing facilities of science teaching and construction of evaluation instruments for its supervision in different types of secondary school in Delhi.* (An unpublished Ph.D thesis). CIE, University of Delhi: Delhi.

Marek, E. (1986). They misunderstand, but they'll pass. *The Science Teacher,* 32-35.

Maria, K., & MacGinitie, W. (1987). Learning from texts that refute the reader's prior knowledge. *Reading Research and Instruction,* 26, 222-238.

Mark, C. P. (1993). The effect of formal reasoning ability and grouping by formal by formal reasoning ability in cooperative study groups upon the alleviation of misconceptions in high school physics. (Doctoral Dissertation, Mississippi State University, 1993). *Dissertation Abstract International,* (53)7, 2315A-2316A.

Marleen, O. B., Roger, A. R. T., Donders, & Ruiter, D. J. (2016). Uncovering Student's Misconception by Assessment of their written question. *Medical Education.*

Mary, J. L., Steven, T. K., & Tessa, C. A. (2014). Misconceptions Yesterday, Today, and Tomorrow. *CBE Life Sciences Education.*

Mayer, K. (2011). Addressing student's misconceptions about gases, mass and composition. *Journal of Chemistry Education.* 88, 111-115.

Mc Closkey, M. (1983). Naive theories of motion. In D. Gentner & A.L. Stevens (Eds.), *Mental models* (pp. 299-324). Mahwah, NJ: Erlbaum.

McWilliam, P. A. (2002). *An examination of the effectiveness of the Socratic dialogue as a tool to promote conceptual change and overcome misconceptions in mechanics.* (Unpublished M. Phil. Dissertation). The University of Plymouth.

Mehrotra, R. N. (2006). *Teacher and Teaching: A Trend Report.* Indore: Devi Ahilya University.

Mestre, J. (1999). Hispanic and Anglo Students' Misconceptions in mathematics-research. Online: http://www.penpages.psu.edu/penpages_reference/28504/285073220.html.

Mestre, J., & Touger, J. (1989). Cognitive Research--What is in it for physics teachers? *The Physics Teacher,* 27, 447-456.

Mesutoglu, C. & Birgili, B. (2017). *Awareness of Misconceptions in Science and Mathematics Education: Perceptions & Experiences of Pre-Service Teachers.* Retrieved from https://www.researchgate.net/publication/319403020

Milenkovic, D. K., Hrin, T. M., Segedinac, M. D., & Horvart, S. (2016). Identification of Misconceptions Through Multiple Choice Tasks at Municipal Chemistry Competition Test. *Journal of subject Didactics,*DOI:10.5281.zenodo.55468

Miller, W. W. (1989). *Philosophy of Social Science.* Retrieved from: https://doi.org/10.1111/j.1468-0149.1989.tb02151.x

Ministry of Education. (1952-53). *Secondary Education Commission. (1952-53).*New Delhi: Government of India.

Ministry of Education. (1956). *Tara Devi Report. (1956).*New Delhi: Government of India.

Ministry of Education. (1966). *Education and National Development. (1964-66*). New Delhi: Government of India.

Ministry of Education. (1968). *National Policy on Education. (1968*). New Delhi: Government of India.

Ministry of Education. (1975). *Curriculum for Ten year School: A Framework. (1975*). New Delhi: Government of India.

Ministry of Education. (1977). *Ishwarbhai Patel Commission (1977).* New Delhi: Government of India.

Ministry of Human Resource and Development (1988). *Curriculum for Elementary and Secondary Education: A Framework. (1988*). New Delhi: Government of India.

Ministry of Human Resource and Development. (1986). *National Policy on Education. (1986*). New Delhi: Government of India.

Ministry of Human Resource and Development. (1992). Plan of Action: *National Policy on Education. (1992*). New Delhi: Government of India.

Ministry of Human Resource and Development. (1992-1993). *Report of National Advisory Committe on Learning without Burden. (1992*). New Delhi: Government of India.

Mintzes, J. J., Wandersee, J. H. & Novak, J. D. (2001). Assessing understanding in Biology. *Journal of Biological Education*, 35(3), 118-125.

Mondal, B. C. & Chakraborty, A. (2013). *Misconceptions in Chemistry- Its Identification and Remedial Measures,* Germany: LAP LAMBERT Academic Publishing.

Moodley, K. & Gaigher, E. (2019). Teaching Electrical Circuits: Teachers Perceptions and Learners' Misconceptions. *Research in Science Education*, 49(1) 73-89 DOI-10.1007/s/11165-017-9615-5

Mouly, G. J. (1978). *Educational Research: The Art and Science of Investigation.* Canada: Holt, Rinehart & Winston of Canada Ltd.

Mukund, K. (1998). The Hoshangabad Science Teaching Project. *Economic and Political Weekly*, 23(42).

Nakhleh. (1992). Why some students' don't learn chemistry. *Journal of Chemical Education*, 69, 191-196.

Narode, R. (1987). *Standardized testing for misconceptions in basic mathematics*. (Unpublished Ph.D thesis). Cornell University, New York.

National Academy Press. (1997). *Science Teaching Reconsidered: A Handbook.* Washington D.C.: Author.

National Council of Educational Research and Training. (1998). *Fifth Survey of Educational Research- Vol-I*. New Delhi: Author.

National Council of Educational Research and Training. (2000). *National Curriculum Framework-2000*. New Delhi: Author.

National Council of Educational Research and Training. (2005). *National Curriculum Framework-2005*. New Delhi: Author.

National Council of Educational Research and Training. (2005). *National Curriculum Framework Review-2005*. New Delhi: Author.

National Council of Educational Research and Training. (2005). *Position Paper: National Focus Group on Teaching of Science*. New Delhi: Author.

National Council of Educational Research and Training. (2020). *National Education Policy -2020*. New Delhi: Author.

National Council of Educational Research and Training. (2023). *National Curriculum Framework for School Education-2023.* New Delhi: Author.

National Research Council. (1996). *National Science Education Standards: Observe, interact, change, and learn*. National Committee on Science Education Standards and Assessment. Washington, D.C: National Academy Press.

National Research Council. (1997). Science Teaching Reconsidered: A Handbook. National Academies Press. Retrieved from https://www.nap.edu/ catalog/5287/science-teaching-reconsidered-A handbook

National Science Teachers Association. (1982). *Science-technology-society: Science education for the 1980's.* (An NSTA Position Statement). Washington.

Neset, D. (2001). The effect of a web based physics software programme on the students' achievement and misconceptions in force and motion concepts. (Doctoral Dissertation, Florida institute of technology, 2001). *Dissertation Abstract International,* (62)3, 966A.

Nguyen, S., & Rosengren, K. (2004). Parental reports of children's biological knowledge and misconceptions. *International Journal of Behavioural Development,* 28(5).

Nik, S., Nik, D., Karim, M. M. A., Noraini, S. W., Hassan, W., & Rahman, N. A. (2015). Misconception and Difficulties in Introductory Physics Among High School and University Students : An Overview in Mechanics, *EDUCATUM - Journal of Science, Mathematics and Technology*, 2(1), 34 – 47.

Novak, I. D. (1988). Learning Science and the Science of Learning. *Studies in Science Education,* 15, 77-101

Novak, J. D. (1980). *Teacher handbook for the learning how to learn program* (Unpublished manuscript). Cornell University, Ithaca: New York.

Novick, S. & Nussbaum, J. (1981), Pupils' Understanding of the Particulate Nature of Matter: A Cross-age Study, *Science Education* 65(2), 187-196.

Nussbaum, J., & Novak, J. D. (1976). An assessment of children's concepts of the earth utilizing structured interviews. *Science Education*, 60, 535-550.

Oberoi, M. (2017). Review of Literature on Student's Misconceptions in Science. *International Journal of Scientific Research and Evaluation,* 5(03), 6274-6280.

Odom, A., Louis, B., & Lioy, H. (1995). Development and application of a two – tier diagnostic test measuring college biology student's understanding of diffusion and osmosis after a course of instruction. *Journal of Research in Science Teaching*, 32(1), 45-61.

Oglesby, M. L. (2010). Efficacy of changing physics misconceptions held by ninth grade students at varying levels through teacher addition to make a prediction phase to the learning cycle. (Doctoral Dissertation, University of Missouri, 2010). *Dissertation Abstract International,* (61)2, 513A.

Organization for Economic Co-operation and Development (2010). *PISA (2009) at a Glance.* London: OECD Publishing.

Organization for Economic Co-operation and Development (2023). *PISA (2022) at a Glance.* London: OECD Publishing.

Osbome and Wittrock, (1983), Learning Science: A Generative Process. *Science Education,* 67, 489-508.

Osborne, R. J. & Cosgrove, M. M. (1983). Children's Conceptions of Changes of State of Water. *Journal of Research in Science Teaching*, 20(9), 825-838.

Padhi, J. S. (1994). High school students' science classroom environment and their attitude towards science. *School Science*, 32(3) 32-37.

Palmer, D. H. (1998). Measuring contextual error in the diagnosis of alternative conceptions in science. *Issues in Educational Research*, 8(1), 65-76.

Patel. R. C. (1997). *A study of scientific attitude and its correlates among Secondary School* Students of Baroda. An unpublished Doctoral thesis in Education. The M. S University of Baroda.

Patil, S. J., Chavan, R. L., & Khandagale, V. S. (2019). Identification of Misconceptions in Science: Tools, Techniques and Skills for teachers. *Arhat Multidisciplinary International Education Research Journal (AMIER)*, VIII(II) 466-472.

Pearson, J. T. & Hughes, W. J. (1988).Problems with the use of terminology in genetics education. *Journal of Biological Education*, 22 (3), 178-182.

Pekmez, E.S. (2010). Using Analogies to Prevent Misconceptions about Chemical Equilibrium. *Asia-Pacific Forum on Science Learning and Teaching.* 11(2).

Peter, R. (2013). Understanding Student Weaknesses. *Harvard Gazette (2013)*.Retrieved fromhttp://www.news.harvard.edu/gazette/story/2013/understanding-student-weaknesses

Piaget, J (1977). *Problems in Equilibration: Theory, Research and application* (pp.3-130) New York: Plenum.

Piaget, J. (1952). *The Origin of Intelligence in Children*: New York: International University.

Pine, A. L., & West, L. H. T. (2001). Conceptual understanding and science learning: An interpretation of research within a sources-of-knowledge framework. *Science Education*, 70(5), 582-603.

Posner, G. J., Strike, K. A., Hewson, P. W., and Gertzog, W. A. (1982). Accommodation of a Scientific Conception: Toward a Theory of Conceptual Change. *Science Education*, 66, 211-227.

Potvin, P. (2014). The effect of predict-observe-explain strategy on learners' misconceptions about dissolved salt. *Frontiers in Human Neuro science*, 1(1), 00014.

Quick, E. F. (2003). An investigation of the relationship between middle school science teachers' knowledge and beliefs regarding the coherence and connections among

science concepts and their classroom practices. (Doctoral Dissertation, Lesley University, 2003). *Dissertation Abstract International,* (64)2, 448A.

Radhakrishnan, R. (2013). Astronomical Misconceptions Prevalent Among High School Students of Kerala. *Issues and Ideas in Education,* 1(2), 151-159.

Ramadas, V. (1993). *A Study on Misconceptions in Science.(Unpublished Ph.D Thesis).* Oregon State University: Thailand.

Ramesh, M. (2014). *Acquisition of science process skills through experiential learning in students of std. VIII (Unpublished Ph. D thesis).* CASE, M. S. University of Baroda, Vadodara.

Ramkumar, N. (2003). *Acquisition of process skills by IV standard pupils through an instructional programme in environmental studies.* (Unpublished Ph.D thesis) CASE, M.S University of Baroda, Vadodara.

Ranchi District Collectorate. (2015). *Ranchi District Information.* Retrieved October 23, 2015 from http://ranchi.nic.in>collectorate

Ranchi District Collectorate. (2015). *Ranchi District Map.* Retrieved October 23, 2015 from http://ranchi.nic.in>collectorate

Ranchi District Superintendent of Education. (2015). *Ranchi District School Information.* Retrieved October 29, 2015 from http://dseranchi.com

Rayla, L. L., & Rayla, L. L. (1938). Some misconceptions in science held by prospective elementary teachers. *Science Education,* 22(5), 244-251.

Read, J. R. (2004). *Children's misconceptions and conceptual change in science education*. Retrieved from http://acell.chem.usyd.edu.au/conceptual-change.cfm

Ross, J. (2004). *Misconception research paper (1-4).* Retrieved from http://www.esu.edu/sps/Dean/judy_ross.htm

Rowell, J. A., Dawson, C. J., & Lyndon, H. (2006). Changing misconceptions: a challenge to science educators. *International Journal of Science Education,* 12(2), 167-175, doi: 10.1080/0950069900120205.

Sahin, C. & Cepni, S. (2011). Development of a Two Tiered Test for Determining Differentiation in Conceptual Structure related to "Floating-Sinking, Buoyancy and Pressure" Concepts. *Journal of Turkish Science Education,* (8)1, 111-118.

Sanders, M. (1993). Erroneousideas about respiration: The teacher Factor. *Journal of Research in Science Teaching*, 30(8), 919-934.

Sanger, J. M. (1997). Identifying attributing and dispelling student misconceptions in Electrochemistry. *Dissertation Abstracts International*, 57(7), 2954-A.

Sarah, L. (2010). *Capacity for Change: A Review of the Nuffield Foundation Commonwealth Programme*, London: Nuffield Foundation.

Sargent Report (1944). *In J. C. Aggarwal (2010). Landmarks in the History of Modern Indian Education.* S. Chand Publishing House: New Delhi.

Satriana, T., Yamtinah, S., & Indriyanti, N. Y. (2018). Student's profile of misconceptions in chemical equilibrium. *IOP Conference Series: Journal of Physics: Conference Series 1097 (2018) 012066* doi:10.1088/1742-6596/1097/1/012066

Saxena, A. (2012). A critical study of the teaching styles of science teachers in different types of secondary school in Delhi. (Unpublished Ph.D thesis). CIE, University of Delhi: Delhi.

Saxena, A. B. (1994). Identification of misconceptions related to work and energy among students. In Krishna Kumar (Ed.), *Sixth survey of Educational Research, Vol. I* (p. 81). New Delhi : NCERT.

Saxena, S., & Mahendroo, K. (2006). Constructivism and Science Education: Revisting Hoshangabad Science Teaching Project, In Chitra Natarajan. Sugra Chunawala (Eds.) *Proceedins of Episteme 2*, Mumbai: HBCSF, TIFR.

Secken, N. (2010). Identifying Student's Misconceptions about SALT. *Procedia Social and Behavioral Sciences,* 2, 234-245

Senear, S. & Eryilmaz, A. (2004). Factors mediating the effect of gender on ninth grade Turkish students' misconceptions concerning electric circuits. *Journal of Research in Science Teaching*, 41(6), 603-616.

Senemoglu, N. (2001). *Development and Learning from the Theory to Practice.* Ankara: Gazi Kitabevi.

Sewell, A. (2002). Constructivism and student misconceptions: Why every teacher needs to know about them. *Australian Science Teachers' Journal*, 48(4), 24-28.

Sewell-Smjth, A. (2004). Teaching does not necessarily equal learning. *Teaching Science,* 50(1), 22-26.

Shavelson, R. J. (1976). An Analysis of the Secondary School Students' Perceptions and Methods for Examining Representation of Subject-Matter Structure in Student's Memory. *Review of Educational Research,* 46,407-441.

Shelat, P. (2013). *Instructional strategy and studying its effectiveness for comprehension in science among class VII students.* (An unpublished Ph.D thesis). CASE, M.S University of Baroda: Vadodara.

Sirakaya, M. (2018). The effect of augmented reality use on achievement , misconception and course engagement. *Contemporary Educational Technolog,* 9(3), 297-314.

Skelly, K. M. (1993). *The Development and Validation of A Categorization of Sources of Misconceptions in Chemistry.* Third Misconceptions Seminar Proceedings.

Smolleck, L. & Hershberger, V. (2011). Playing with Science: An Investigation of Young Children's Science Conceptions and Misconceptions. *Current Issues in Education,* 14(1). 1-31.

Sopapun, S. (1994). The development of a two-tiered multiple choice test to measure misconceptions in physics among high school students in Thailand. (Doctoral Dissertation, Oregon State University, 1994). *Dissertation Abstract International,* (54) 12, 4402A.

Soyiba, K. (2008). A review of some sources of students misconception in Biology. *Singapore Journal of Education,* 15(2), 1-11. Doi: 10.1080/02188799508548576

Special Issue on Modelling Conceptual Change, (2014). *Science and Education,(23)7.*

Storey, R. D. (1991). Textbook errors and misconceptions in biology: cell metabolism. *American Biology Teacher,* 53(6), 339-343.

Storey, R. D. (1992). Textbook errors and misconceptions in biology: cell energetics. *American Biology Teacher,* 54(3), 161-166.

Subari, K. (2017). Improving understanding and reducing matriculation students' misconceptions in immunity using the flipped classroom approach. *Overcoming Students Misconceptions in scienc,* 16(2), 265-282.

Tahsin, K. (2001). Pre-service elementary teachers' misconceptions with respect to three environmental issues. (Doctoral Dissertation, Indiana University, 2001). *Dissertation Abstract International,* (61)8, 3110A.

Tam, P. H. (2015). The identification of students misconceptions on a two tier item. *Science Education Research and Practices,* 15(2), 147-162. doi: 10.1007/978-981-287-472-6_7

Tamkavas, C. H., Kiray, S. A., Koack, A., & Kocak, N. (2016). Misconceptions about heat and temperature in Turkey between 2005-2015: A content analysis. *Necatiby Faculty of Education Electronic Journal of Science & Mathematics Education*, 10(2), 426-446.

Tan, K. C. D., Goh, N. K., Chia, L. S., Treagust, D. F. (2002). *Development and application of a two-tier multiple choice diagnostic instrument to assess high school students' understanding of inorganic chemistry qualitative analysis.* Retrieved from: https://doi.org/10.1002/tea.10023

Tangmongkollert, S. (1994). *Development And Use of an Instrument to Measure Student Misconceptions of Selected Science Concepts at the Elementary School Level in Thailand.* Oregon State University: Thailand.

Taylor, L. B., Spindler, S. R. Garvin-Doxas, R. K., &, Klymkowsky, M. (2011). Two dimensional, implicit confidence tests as a tool for recognizing student misconceptions. *Journal of College Science Teaching*.

Tekkaya, C. (2002). Misconceptions as barrier to understanding Biology. *Hacettepe Universitesi Egitim Fakultesi Dergisi*, 23, 259-266.

Temiz, B. K. & Yavuz, A. (2014). Students' misconceptions about Newton's second law in outer space. *European Journal of Physics*, 35(4), 045004.

Thagard, P. (2009). Why Cognitive Science Needs Philosophy and Vice Versa. *Topics in Cognitive Science* 1(2):237-254 DOI:10.1111/j.1756-8765.2009.01016.x

The PROBE Team (1996). *Public Report on Basic Education in India.* New Delhi: Oxford University Press.

The PROBE Team (1998). *Public Report on Basic Education in India.* New Delhi: Oxford University Press.

The PROBE Team (2006). *Public Report on Basic Education in India.* New Delhi: Oxford University Press.

Thompson, F. & Logue, S. (2006). Exploration of common student misconceptions in science. *International Education Journal,* 7(4), 553-559.

Tippett, C. D. (2010). Refutation text in science education: A review of two decades of research. *International Journal of Science and Mathematics Education*, 8, 951-970. doi:10.1007/s107633010392033

Treagust, D. F. (1988). Development and use of diagnostic tests to evaluate students' misconceptions in science. *International Journal of Science Education*, 10(2), 159-169.

Trowbridge, J. E. & Mintezs, J. J. (1985). Students' Alternative Conceptions of Animals and Animal Classification. ERIC, 85(4) p304.

Trowbridge, J. E. & Wandesee, J. H. (1994). Identifying critical junctures in learning in a college course on evolution. *Journal of Research in Science Teaching*, 31(5), 459-473.

Tyson, L., Treagust, D. F. & Bucat, R. B. (1999). The complexity of teaching and learning chemical equilibrium. *Journal of Chemical Education*, 76, 554-558.

Umashree, P. S. (1999). *Science curriculum and its transaction: An exploratory study in the secondary schools of Vadodara Gujarat*. (An unpublished Ph.D thesis). CASE, M.S University of Baroda: Vadodara.

Unal, G. & Ergin, O. (2006) Science Education and Models. *National Education Journal*, 171, 188-196.

UNESCO. (1992). *Towards Developing New Teacher competencies in Response to Mega Trends in Curriculum Reforms.* A Report of a regional study Group Meeting on Teacher Education organised by UNESCO PROAP in Collaboration with the department of Teacher Education. UNESCO Principal Regional Office for Asia and the Pacific, Bangkok.

Veerappa, K. (1958). A study to examine the position of science education in India. In M. B. Buch (Ed.), *Fourth survey of research in education, Vol. II* (p. 712).New Delhi: NCERT.

Von Glasersfied (1982). *In Bodner, G. M. (1986). Constructivism: A Theoryof Knowledge. Journal of Chemical Education, 63, 873.*

Voska, K. W. & Heikkinen, H. W. (2000). Identification and analysis of student conceptions used to solve chemical equilibrium problems. *Journal of Research in Science Teaching*, 37, 160173.

Vosniadou, S., & Brewer, W. F. (1992). Mental models of the earth and study of conceptual change in childhood. *Cognitive Psychology*, 20, 535-585.

Vosniadou, S., & Brewer, W. F. (1994). Mental models of the day and night cycle. *Cognitive Science,* 18, 123-183.

Wadih, A. R. (1993) in his study exploration of factors that may determine what misconceptions prospective elementary teachers at Wayne State University have in some concepts of physical science. . (Doctoral Dissertation, Wayne State University, 1993). *Dissertation Abstract International,* (54)3, 879A.

Wandersee, J. H. (1985). Can the history of science help science educator anticipate students' misconception? Journal of Research in Science Teaching, 23, 581-587.

Wandersee, J. H., (1983). Suppose a world without science educators. *Journal of Research in Science Teaching,* 20(1), 711-713.

Wandersee, J. H., Mintzes, J. J., & Novak, J. D. (1994). *Research on alternative conceptions in science: Handbook of research of science teaching and learning, edited by Dorothy L. Gabel.* New York: Macmillan Publishing, 177-210.

Wandersee, J. H., Mintzes, J.J ., & Arnaudin, M. (1989). Biology from the learners' viewpoint: A content analysis of the research literature. *School Science and Mathematics,* 89(3), 654-668.

Widiyatmoko, A. & Shimizu, K. (2018). Literature review of factors contributing to students' misconceptions in light and optical instruments. *International Journal of Environmental & Science Education,* 13(10), 853-863.

Wiji, W., & Mulyani, S. (2018). Student's mental model, misconceptions, troublesome knowledge, and threshold concept on thermochemistry with DToM-POE. *IOP Conference Series: Journal of Physics: Conference Series* ***1013*** *(2018) 012098* doi :10.1088/1742-6596/1013/1/012098.

William, C. P. (1993) A survey of eighth grade Earth science students' misconceptions about fundamental Earth science ideas and their teachers' perceptions about their students' knowledge of these fundamental ideas. (Doctoral Dissertation, University of Maryland college Park, 1988). *Dissertation Abstract International,* (54)1, 137A.

Woods Despatch (1854). *In J. C. Aggarwal (2010). Landmarks in the History of Modern Indian Education.* S. Chand Publishing House: New Delhi.

Yager, R. E., & McCormack, A.J. (1989). Assessing teaching/ learning successes on multiple domains of science and Science Education: *Science Education* Journal, 73(1, 45-58.

Yasin, A. (2017). A Review of Research on the Misconceptions in Mathematics Education. *Education Research Highlights in Mathematics, Science & Technology*, 21-31

Yen, C. F., Yao, T. W., & Chiu, Y. U. (2004). Alternative Conceptions in Animal Classification Focussing on Amphibians & Reptiles: A Cross-Age Study. *International Journal of Science and Mathematics Education,* 2, 159-174.

Yiebekal, A. (2014). Conceptions and Misconceptions of Students about Photosynthesis and Cellular Respiration in Plants. *Zenith-International Journal of Multidisciplinary Research,* 4(1), 259-272.

Yip, D. Y. (1998). Teachers' misconceptions of the circulatory system. *Journal of Biological Education*, 32(3), 207-216.

Zajkov. O., Zajkov. G. S., & Mitrevski, B. (2017). Textbook caused misconceptions, inconsistencies and experimental safety risks of grade 8 physics textbook. *International Journal of Science and Math Education*, 15, 837-852. doi: 10.1007/s10763-016-9715-0

Zakir Hussain Committee (1938). *In J. C. Aggarwal (2010). Landmarks in the History of Modern Indian Education.* S. Chand Publishing House: New Delhi.