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.(2002).

.(2005).

- Baraman, C. (1997). "*The learning cycle revisited A modification of an effective teaching model*". Monograph 6. Washington, DC: Council for elementary Science International
- Blank,L. M. (2000). "A Met cognitive Learning Cycle A better Warranty for student understanding", *Science Education*, vol (23), p(468-506) .
- Campell, M.(2006). "The Effects of the 5E Learning Cycle Model On Students Understanding Of Force And Motion Concepts", *Dissertation Abstracts International- A*, 44(5), p (20-71).
- Dabageh ,Nada H. et al. (2000). "*Assessing a problem – Based Learning Approach to an Introduction Instructional Design Course : A case study*", *Performance Impartment Quarterly* .
- Sum,Leung. (2003). "*Applying Computer-mediated Concept Mapping on problem-based Learning in Biology ,master dissertation*", The University of Hong Kong .
- Martin, R. (1994). *Teaching science for all children*. London: Appyn and Bacon publisher .
- Sunger ,Semra .et al. (2006). "improving achievement through problem – based learning", *Educational Research*, vol4., Number 4,Middle East Technical University, Turkey, p (155-16) .
- Wesolowski, Meredith .(2008)."*Facilitating problem based learning in an online biology laboratory course*", Doctoral Dissertation, University Delaware.