

Maliwan Pratumtong 2014: The Development of Concept on Cell Division and Genetic Inheritance of Grade 10th Students by Using Inquiry-based Learning. Master of Education (Science Education), Major Field: Science Education, Department of Education. Thesis Advisor: Miss Jeerawan Ketsing, Ph.D. 206 pages.

This study aimed to 1) develop students' scientific concept on cell division and genetic inheritance by using inquiry-based learning, and 2) explore techniques in inquiry-based learning that promote the development of students' scientific concept in the focus topic. The participants were 35 10th graders who studied Basic Biology subject in an academic year 2013. In addressing the first research aim, the researcher collected data by utilizing conceptual test. The students' responses were categorized into 5 categories: Scientific Conception, Partial Conception, Partial Conception & Complete Misconception, Complete Misconception, and No Response. In addressing the second aim, the data was gathered via researcher's journal, videotapes of classroom instruction and discussions with teacher researcher. The data was analyzed through inductive analysis.

The result revealed that after learning the concepts via inquiry-based learning, a number of students who were in Scientific Conception category was increased from before learning in all concepts, particularly in the concepts of 1) number of chromosome in organisms, 2) relationship among gene, DNA, and chromosome, and 3) chemical components of DNA, respectively. However, the study found that even after the instruction, many students were still in Complete Misconception or Partial Conception & Complete Misconception categories, particularly in meiosis process, DNA structure, and mitosis process, respectively. Moreover, the study found a number of teaching techniques in inquiry-based learning that might be able to promote students' scientific concept, for example: 1) the questions used for exploring student's prior knowledge should be succinct; 2) instructional media should be used with systematic questions in order to motivate students' interest; 3) instructional media should be highly related to the focused concept and should not be a source of misconception; 4) the discussion with students before conducting learning activity promote the successfulness of the activity; 5) the learning activities should fit with timeframe and should be interesting; 6) in presenting the result, teacher should select only the groups that have representative result of the class to present their findings; 7) encouraging students to learn for themselves, not for rewards; 8) students should have opportunities to compare new knowledge with prior knowledge; and 9) teacher should use a variety of assessment methods to assess students' learning.

Student's signature

Thesis Advisor's signature