Effectiveness of inquiry based learning in teaching biology

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New methods and practices are constantly being introduced in education with an objective to get students understand and interpret his/her learning. Learning is a very personal and individualized experience for students who usually have to adapt to an educator's pedagogy or strategy of teaching.

This study was designed to evaluate the effectiveness of inquiry-based-learning (IBL) teaching methods over traditional lecture instruction in the context of biology concept. Random selection process was used to select the schools. Four were kept as control and four were selected for experimentation and grade 8 students (n= 30) were selected for the study. A teaching intervention was designed on the basis of IBL and was put into practice. Study was conducted for duration of one month

The activities involved in this study included inquiry-based activities and traditional activities on topics, such as, photosynthesis, food and nutrition, transportation in plants, sense organs, respiration, bio-diversity, etc... Students were given a pre-test to assess prior knowledge of the units that would be covered in the classroom lessons. The same assessment was also administered at the completion of the unit.

When comparing unit test scores, inquiry students' scores were significantly higher than the traditional lectures. If inquiry activities are executed properly, implementing them into the Biology curriculum can increase learning gains in Biology topics. This suggests that classroom interactions taking place in inquiry laboratories closely resemble the thinking involved by scientists. Inquiry Based learning approach will show a positive impact on students' conceptual understanding and scientific skills. It was also observed that children were more open to activities and were enjoying when they were learning by Inquiry method

Keywords: *IBL, traditional lecture method, strategy, scientific skills.*

Biomimetics- Inspiring Biology Students Beyond The Obvious

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Introducing students to the field of biomimetics has potential to add new, stimulating and creative dimensions in the study of biology. Biomimetics, also known as biomimicry is about drawing inspiration from nature's inherent forms, processes and systems to find innovative and sustainable solutions to human challenges. In the study of biology, students have opportunity to acquire knowledge about living systems. This would broadly include study of life forms, their origin, functioning, growth, development, distribution and correlations with each other and surroundings. This knowledge may then further extend to applications of biology addressed in subjects like medicine, biotechnology, biomedical engineering etc. Biomimetics offers potential to supplement the existing "learning about" with "learning from" biology. For instance, with

biomimetics, knowledge acquired from the study of biology could extend beyond the utilization of living systems for our needs. It would involve being inspired by that understanding to design innovative strategies of our own. Bio-inspired design will challenge students to not only deepen their understanding of biology but also integrate their learning by establishing connections with other disciplines – be it maths, physics, chemistry or other. With advanced understanding, biomimetics holds relevance not only for technological innovations; but also in (community / industry / organization) management and policy making. This work (a) outlines some aspects related to the field of biomimetics that could enrich biology students' learning experiences and (b) reports preliminary analysis of written responses obtained from high school students who attended an interactive talk on biomimetics. The responses stated here are students' answers to questions posed to them during the talk delivered by the first author, as a part of an enrichment session for students. Themes and values that emerged from this analysis are reported. For example, some students' responses related to re-cycling of waste, environmental balance and sensible resource use were indicative of sustainability values. Some writings seemed to draw inspiration from the social life of insects and conveyed values of harmony.

Keywords: *Biomimetics, biology, bio-inspired design, technology, sustainability, multi-disciplinary*

Study of Efficacy of Activity Based Learning Model on Learning Life Science among Upper Primary School Students

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Being process of inquiry, science can be learned best by doing. Therefore, the kind of pedagogical strategy the teacher is employing for authentic engagement of learners so that they can do science, emphatically by inquiry, is most important. Designing teaching learning activity that facilitates learner to adapt to science process skills and to construct concept of life science is always challenging. The present research has tried to study the efficacy of Activity Based Learning Model (ABLM) designed to ensure engagement-exploration-explanation-elaboration stages in inquiry based learning process on the basis of constructivist pedagogy, in terms of enhancing science process skills and concept formation. The quasi-experimental study involves pre-test – post-test non-randomized control group design. The experimental group comprising of ten students of class-VIII standard was taught two lessons of life science by ABLM, whereas the control group of same size was taught by conventional teaching method. The relevant descriptive statistics along with qualitative judgment of learners revealed that application of ABLM has enhanced the science process skills and clarity of concepts in life science. Thus the efficacy of the Activity Based Learning Model (ABLM) is found to be positive in optimizing science learning at upper primary level.

Keywords: *Activity Based Learning Model (ABLM), constructivist pedagogy, science process skills, concept formation*