INCORPORATING STUDENT MOTIVATION AND CONTENT KNOWLEDGE THROUGH INQUIRY BASED TEACHING IN BIOLOGY

Methodology / Treatment

- The study started and ended with a survey designed to gauge student attitude and motivation towards science, as well as their preferred methods of learning.
- The study alternated between a treatment unit each taught using a different inquiry based curriculum and a unit taught with more traditional classroom lecture and practice techniques.
- Pre- and post tests were administered for each unit to measure student understanding of concepts.
- Students reflected upon their learning in a digital lab notebook after each activity or lab to gauge whether inquiry or traditional methods gave students a better understanding of the topic, and discover what questions they still had, or struggled with.
- Students also undertook an independent research project lasting the semester on a topic of their own choosing.
- Students took a state assessment in science (MCA) at the end of the course, which was compared to previous state assessment scores.

Results

- An improvement in student attitude and motivation was observed during the inquiry activities. This was shown in the increase in positive responses on the student survey.
- Test scores were analyzed at the 95% significant level using a Wilcoxon test.
  - No difference in student content knowledge was observed between the traditional units and inquiry units on the pre- and post-unit tests.
  - A significant differences in MCA scores was observed with 38% of students having previously passed the MCA in 8th grade and after inquiry instruction 73% of students passing the tenth grade MCA.

Conclusions

Overall I believe that inquiry based teaching is of benefit when it come to classroom culture, as student motivation and attitude towards science are improved. Inquiry based teaching also proved to be a useful tool for improving student understanding of scientific practices, and as such helped improve state standardized test scores. There was no significant change to subject specific content acquisition through inquiry based teaching practices, but as there were no decreases in learning either, the benefits shown by this study outweigh these results.

Table 1. Data collection Methods.

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<th>Focus Question</th>
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<td>MCA Test scores</td>
<td>Student observations and questions</td>
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