

Course: EDEE 434 (Formerly EDEE 455, Science Methods, Fall/Spring 2011-12)
Signature Assignment: Looking at Students' Understanding of Science Concepts

e. Brief Description: One of the most important aspects of a teacher's job is to uncover what a student understands or doesn't understand about a specific science concept. Understanding is not about repeating the "right" answer or science fact, but the student's core understanding of the science concept. One effective way to uncover students' understandings is to engage them in a one-on-one conversation in which teachers ask questions and listen to students' answers.

Instructions to the Candidate: The purpose of this assignment is to give you practice designing assessment questions, first on paper and then as tools in a conversation with a student through a *Science Interview Question Guide* you will develop. Note: Before beginning this project, please obtain "Permission to Interview Your Child" from the parents or guardians, in order to protect the confidentiality of the student whom you will be interviewing.

After the interview, prepare a verbatim transcript that you will use to assess the student's grade-level understanding of the science concept targeted by the questions. Please use pseudonyms when referring to the students. Once you have analyzed the student's core understanding, you will prepare an "imaginary" letter home that documents the student's grade-level understanding of the science concept as revealed in the interview transcript. Use actual quotes and information from your transcript and analysis to synthesize what the student's understanding of this science concept is and provide suggested activities or experiences for the parent or guardian to help their child progress to the next level of understanding.

Fall 2011

ACEI Standard	n =	Range of scores	Mean	Standard deviation	Students who achieved target
1.0	17	2	2	0	100% 17/17
2.2	17	1-2	1.94	.24	94% 16/17
3.1	17	2	2	0	100% 17/17
3.3	17	1-2	1.76	.44	76% 13/17
5.1	17	1-2	1.94	.24	94% 16/17
5.2	17	1-2	1.59	.51	59% 10/17

Spring 2012

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REFLECTIONS

Fall 2011:

The scores from the signature assignment rubric suggest that the Teacher Candidates are developing the skills necessary to design questions and implement an interview designed to uncover grade appropriate science understanding of elementary students (Standards 3.1) indicated by the fact that no candidates scoring in the unacceptable level and 100% scoring a 2 or the target performance level, indicating that focused effort by the instructor based on lower scores for this item in past semesters has been effective. For the rubric item (Standard 3.3), the Teacher Candidate can design Single well defined science concept that lends itself to a concrete hands-on/minds-on investigation and is aligned to Hawaii Science Standards, the students performance was not as strong with only 76% hitting the target performance of the rubric. While this score is significantly higher than the fall 2011 score, it was only slightly higher than the spring 2011 score with an improvement of 4%. This score, while better than previous semesters, suggests that, more work can still be done to help the candidates develop their critical thinking and problem solving skill, it should be noted that none of the scores were at the unacceptable level. Scores for the rubric item specific to science content (Standard 2.2), Teacher Candidate can design questions that reflect a deep personal knowledge of the science concept and provide evidence that candidate did additional research about concept to increase their own ability to understand and explain the science concept, indicate that Teacher Candidates have worked to increase their own content knowledge in preparation for designing the interview questions, with 100% achieving a target score. For the rubric item focusing on professional growth (Standard 5.1), the scores indicate that the Candidates' deepened their own knowledge of the concepts through research by using a variety of resources available for professional learning, the scores mirror those from fall 2010 with 94% achieving a target score. The rubric score for Standard 5.2, with 59% making the target score suggests that the candidates continue to need more instruction in linking the data from the interview to student evidence to student understanding. It is also a matter of concern to the instructor that the candidates' ability to meet target dropped from the previous spring where 71% met the target. The percentage meeting target in the fall 2011 was 58%, almost identical to this semester suggesting that the instructor needs to refer back to his rubric scores prior to the start of each semester and suggests that more emphasis on this standard will be added again in the future. Standard 1.0 was targeted by the rubric item focused on the format of the letter, analysis of the letter and use of student artifacts in reporting understanding of concepts. Scores for this item indicate that 100% of candidates scored at the target level and none at the unacceptable level. In general the rubric scores for this group of teacher candidates suggest that their weakness is their ability to design questions that focus on well-defined science concepts that are aligned to the Hawaii Science Content Standards as well as designing questions that truly uncover student conceptual understanding. These weaknesses suggest areas for redesign in the course and the instructor's focus on content.

Spring 2012:

The scores from the signature assignment rubric suggest that the Teacher Candidates this term were less successful in developing the skills necessary to design questions and implement an interview designed to uncover grade appropriate science understanding of elementary students (Standards 3.1) indicated by the fact that only 55% scored a 2 or the target performance level, indicating that the instructors efforts to target this area was less successful than in previous semesters. It is hoped that this group of candidates was an anomaly from previous groups but just to be sure the instructor will expend more effort in this area of instruction. For the rubric item (Standard 3.3), the Teacher Candidate can design Single well-defined science concept that lends itself to a concrete hands-on/minds-on investigation and is aligned to Hawaii Science Standards, the candidates' performance improved significantly from the previous semester with 91% hitting the target performance of the rubric. While this score is much better than fall 2011, it suggests that the instructor should evenly focus efforts rather than focus so heavily on specific standards. Scores for the rubric item specific to science content (Standard 2.2), Teacher Candidate can design questions the reflect a deep personal knowledge of the science concept and provide evidence that candidate did additional research about concept to increase their own ability to understand and explain the science concept, indicated a significant decline from past semesters with 27% achieving a target score. While this score was lower than the previous semesters, it should be noted that none of the students scored lower than acceptable on this item or any of the items for that matter. For the rubric item focusing on professional growth (Standard 5.1), the scores indicate that the Candidates' need considerable instruction to help them deepened their own knowledge of the concepts through research by using a variety of resources available for professional learning, the scores mirror those for Standard 2.2 with 27% achieving a target score. The rubric score for Standard 5.2, increased from 59% to 100% meeting the target score suggesting that the instructors efforts focusing instruction on linking the data from interviews to student understanding as well as instruction on understanding age-appropriate recommendations to parents has been successful. However, this increase is off set by the loss of target attainment on some of the other standards suggesting that the instructor redouble efforts to focus more broadly on meeting all standards rather than focusing on specific curriculum needs.. Standard 1.0 was targeted by the rubric item focused on the format of the letter, analysis of the letter and use of student artifacts in reporting understanding of concepts. Scores for this item indicate that 82% of candidates scored at the target level, essentially unchanged from the previous spring semester, but somewhat lower than from the fall of 2011. While this score is strong, the instructor still sees room for improvement and will focus additional energy on improving the number of candidates achieving the target score. Overall the rubric scores for this group of teacher candidates was lower than seen in previous semesters suggesting that transition from two to three credits has not been as smooth as hoped. The instructor will continue to redesign the course and makes improvements and adjustments based on the results of these scores and continue to focus instruction in all areas addressed by the standards.