3.3.g Assessment 3: Lesson Series for Science/Math Methods (EDU 303/304)

ACEI 2.2: Science Content Knowledge

ACEI 3.1-3.2-3.4-3.5- Planning for diverse learners, critical thinking, active engagement and communication

ACEI 4.0: Assessment

ACEI 5.1: Reflection

Data Analysis: Data for this assignment focused on science instruction for the 2012 cohort. This served as a check for science content knowledge, as this subject has lower grade point averages and Praxis II scores. The scores are generally higher for this assignment as students complete a similar assignment in the fall semester in language arts and math. However, scores were still lower in many areas; this could be due to the instructor assuming students were familiar with the rubric (as they used it previously) and not taking the time to discuss requirements with the candidates or the candidates not providing details on certain aspects of classroom instruction. The instructor approached the assignment differently in 2013, so the data for 2013 may be more reliable. Regardless, some trends emerge reflecting their competence of the ACEI standards. Overall, students demonstrated competence to meet aspects of ACEI standards 3.1, 3.2, 3.4, 4.0 and 5.1. Their strengths are reflected in their ability to integrate disciplines, plan developmentally appropriate instruction, use a variety of instructional strategies which promote higher level thinking and problem solving, and write and assess effective lesson objectives based on standards as required in ACEI 3.1. The candidates are also able to use a variety of verbal and nonverbal teaching strategies as stated in ACEI 3.5, and are able to analyze their teaching and student learning as found in ACEI 5.1. Candidates are weaker in demonstrating competence in assessing validity, reliability and biases in an assessment instrument and isolating what exactly students learned and what must be retaught as part of ACEI 4.0. Checks of candidate’s science content knowledge and knowledge and application of nature of science need to be supported more in coursework to help develop competence in ACEI 2.2. Also to meet this standard, candidates need more support in develop inquiry-based lessons. Candidates tend to use more whole group instruction instead cooperative group strategies that could help create supportive learning environments (ACEI 3.4).

EDU 303/304

Lesson Series Lesson format

ACEI standards 3.1, 3.2, 3.3, 3.4, 3,5, 4.0. 5.1

Part I: Goal of assignment: In this assignment, you are to design a small unit covering one, possibly two standards. The unit should be three days in length, integrate science and math (or language arts) and will be taught the first part of April. You will then analyze your teaching and student learning that occurred during your lessons.

Lesson format:

* The 5E format should be used. Each day should contain one or more parts of the 5E lesson format.
* The lesson series should contain an inquiry-based activity. You are required to justify why it was inquiry-based and identify the level of inquiry according to the inquiry continuum by Colburn as studied in class. Lesson should include all three aspects of science and an opportunity for the students to present their math knowledge in various representations.

Lesson should include:

A paragraph summary of the math and science content you will be teaching

A list of misconceptions (researched or published relating to the topic with source) or actual ones found in your class

Explanation of inquiry and justification of level

Standards

Objectives

Materials/Safety considerations

Adaptations for diverse learners

Lesson sequence with special attention to HOT question prompts/student responses and grouping strategies (if used)

Assessment strategies (include all handouts, rubrics, grading keys and examples of student work of various levels)

Part II: Analysis of Teaching and Learning-Analyze your teaching (using the feedback by your mentor teacher) and student work to answer the following questions. Be detailed and provide specific examples and data. Clearly organize your data/evidence in charts and graphs as needed.

Guiding questions:

a). What did you do well? What did not go so well? What would you do differently if you retaught the lesson again?

b). What did your students learn from your lessons? How do you know? Form a complete picture of student learning.

c). If you could, what would you reteach and how would you do so?

Helpful tips:

* Even though there are many ways to assess student learning, I would like for you to do a pre/post test format for this assignment. It would be incredibly helpful if you could give (or maybe your mentor teacher could give) the pre-test this week before the student leave for break and you start planning the lesson series in detail.
* If you are teaching the lessons together in the three day time period and/or integrating them, you only need one lesson plan. If the lessons are totally separate, then two lesson plans are required. Both subjects need an analysis of student learning.
* Categories on the rubric are not equal. See side notes for point values for the different rubric lines.
* Teacher feedback sheets are required for each day in the lesson series. You will use the 5 pt scale for more detailed feedback.
* If teacher requests a certain topic, indicate such on your lesson plan.
* Be detailed and give yourself credit for the good work you do.
* Starting writing now!
* Use the rubric as your guide!

**Lesson Series Scoring Guide**

**Teacher Education Program - Hanover College**

**February 2012- Science/Math Lesson Series**

***Part I: Developing the lesson (100 pts)***

***I. Competence: Knowledge (INTASC Principle 1,7)***

***Data for 2012 cohort-18 students (2 candidates off sequence and took methods at time time)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Level 1: C | Level 2: grade B | Level 3: Benchmark for A grade | Comments: |
| Knowledge of Discipline  ACEI 2.2/2.3  ACEI 2.2  ACEI 2.2  ACEI 2.3  (5 pts each-20 pts) | \* Identifies major concepts, conceptual frameworks that are central to the discipline  **2012: 0**  \*no possible misconceptions identified  **2012: 0**  \*only one dimension of science presented  **2012: 0**  \*students follow one method for solving problems  **2012: 2/18-11.1%** | \* Explains major concepts, conceptual frameworks that are central to the discipline  **2012: 8/18-44.4%**  \*identifies one or two common student misconceptions from literature  **2012: 6/18-33.3%**  \*Only two dimensions of science are presented  **2012: 12/18-66.7%**  \*opportunity for various student representations/explanations of math content, but not shared  **2012: 8/18-44.4%** | \* Clearly explains (in paragraph form or concept map) content to be presented in lesson, defining key concepts and how they are connected in own words. (both science and math)  **2012: 10/18- 55.6%**  \* Identifies at least 3 common student misconceptions from literature or actual misconceptions of your current students.  **2012: 12/18-66.7%**  \* All three dimensions of science are present in objectives and lesson content (content, process and nature of science)  **2012: 1/18- 5%**  \*opportunity for various student representations/explanations of math content shared with class  **2012: 8/18-44.4%** |  |
| Teaching of the Discipline  ACEI 3.1  ACEI 3.3  5 pts/5 pts)  ACEI 2.2/2.3  (7 pts)  ACEI 2.2  (5 pts)  ACEI 2.2  (10 pts) | \* Shows no connection between multiple content area learning experiences  **2012: 0**  \* Sets objectives limited to basic recall of facts of the discipline  **2012: 0**  \*Creates few if any hands-on activities for students  **2012: 0**  \*type of inquiry misidentified or not present  **2012: 3-16.7%**  \*lessons not in a 5E format  **2012: 0** | \* Develops interdisciplinary experiences are forced and are not a natural progression for students  **2012: 0**  \* Sets objectives for comprehension of concepts  **2012: 3/18-16.7%**  \*Creates varied activities/cookbook based for students with low level of inquiry  **2012: 7/18-38.9%**  \*type of inquiry identified but nor justified why  **2012: 9/18-50%**  \*5E format used, but steps in wrong order or not appropriately used  **2012: 3/18- 16.7%** | \* Creates interdisciplinary learning experiences that allow students to integrate knowledge and skills  **2012: 18/18-100%**  \* Sets objectives for application of concepts in the discipline  **2012: 15/18-83.3%**  Creates opportunities for inquiry/ problem-based learning) within the discipline for students  **2012: 11/18-61.1%**  \*Identified type of inquiry according to inquiry continuum and justified why  **2012: 6/18-33.3%**  \*5E lesson plan format used effectively  **2012: 15/18-83.3%** |  |

***I. Competence: Planning (INTASC Principle 1,2,7,8)***

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| --- | --- | --- | --- | --- | --- |
| Criteria | | Level 1 | Level 2- B | Level 3- A- | Comments: |
| Based on Student  ACEI 1.0  ACEI 3.2  ACEI 3.2  ( 4 pts each- 12 pts total) | \* Plans instruction that is occasionally developmentally inappropriate  **2012: 1/18-5%**  \*strategies not well documented for academic needs of students  **2012: 0**  \*little variation in lesson strategies  **2012: 0** | | \* Plans developmentally appropriate activities  **2012: 2/18-11.1%**  \*strategies for various present but not well-described  **2012: 6/18-33.3%**  \*varied strategies in lesson for diverse learners  **2012: 11/18-61.1%** | \*Plans developmentally appropriate activities and documents how incorporated or built upon students’ prior knowledge and experience  **2012: 15/18-83.3%**  \*strategies for various levels of academic diversity well described and documented in lesson plan  **2012: 12/18-66.7%**  \*varied strategies in lesson for diverse learning styles with detailed and targeted connections  **2012: 7/18-38.9%** |  |
| ACEI 4.0  Based on Assessment  (3 pts) | \* Not likely to use assessments as part of planning  **2012: 0** | | \* Uses assessments as part of planning  **2012: 3/18-16.7%** | \*Uses and documents informal and formal assessments (pretests, classroom observations, and discussions with mentor teacher) in planning lesson series  **2012: 15/18-83.3%** |  |
| ACEI 4.0  Based on Discipline  ACEI 4.0  ACEI 4.0  ( 5 pts each-15 pts total) | \*Chooses and implements activities with little or no connection to the objectives of the lesson series.  **2012: 0**  \*lesson objectives are incomplete or certain ones missing  **2012: 0**  \*more than one standard or objective is not assessed  **2012: 1/18-5%** | | \*Chooses and implements activities that allow students to make some connections to the objectives of the lesson series.  **2012: 3/18-16.7%**  \*lesson objectives are present but are not measurable  **2012: 3/18-16.7%**  \*One standard or objective is NOT assessed  **2012: 2/18-11.1%** | \*Lists subject specific behavioral/performance objectives developed for each lesson related to student standards  **2012: 15/18-83.3%**  \*Lesson objectives are written correctly and cover all aspects of standards/prerequisite skills  **2012: 15/18-83.3%**  \*All standards and behavioral objectives assessed  **2012: 15/18-83.3%** |  |

***I. Competence: Organizing for Teaching (INTASC Principle 5 &6)***

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| --- | --- | --- | --- | --- |
| Criteria | Level 1- C | Level 2- B | Level 3- A | Comments |
| ACEI 3.4  ACEI 3.4  Motivation and  Instructional Groups  (3 pts each) | \*Whole group instruction/teacher directed lessons used extensively with little attention for learning from peers  **2012: 0**  \*students working individually  **2012: 2/18-11.1%** | \* Engages in primarily whole group instruction with opportunities for social interaction and supportive learning atmosphere; varied teacher role  **2012: 7/18-38.9%**  \*groups used, but no strategy for assigning groups given  **2012: 9/18-50%** | \* Incorporates cooperative groups that develop shared values and responsibility for positive climate/productive work; teacher role varies (coach, audience member, facilitator)  **2012: 11/18-61.1%**  \*describes how groups are determined  **2012: 7/18-38.9%** |  |
| ACEI 3.5  ACEI 3.5  Communicate to foster collaboration  ( 3 pts each) | \* Uses verbal and nonverbal strategies to communicate  **2012: 0**  \* Uses little technology and/or uses inappropriately  **2012: 5/18-27.8%** | \* Uses some verbal and nonverbal strategies  **2012: 1/18-5%**  \* Uses some technology but it does not contribute to teaching and learning  **2012: 2/18-11.1%** | \*Uses a variety of verbal and nonverbal teaching strategies  **2012: 17/18-94.4%**  \* Integrates appropriate technology that makes a contribution to teaching and learning  **2012: 11/18-61.1%** |  |

***I. Competence: Critical Thinking (INTASC Principle 4,6 & 8)***

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| --- | --- | --- | --- | --- |
| Criteria | Level 1- C | Level 2- B | Level 3- | Above and Beyond-A |
| ACEI 3.3  Type of Thinking  ACEI 3.3  ( 3 pts each) | \* Lists various kinds of instructional strategies  **2012: 0**  \*no HOT question prompts provided  **2012: 0** | \* Uses a variety of instructional strategies  **2012: 3/18-16.7%**  \*documents questions in lessons  **2012: 10/18-55.5%** | \*Uses a variety of instructional strategies which promote higher level thinking and problem solving  **2012: 15/18-83.3%**  \*documents HOT question prompts in lessons  **2012: 8/18-44.4%** |  |

***Part II: Analysis of Learning and Teaching- Being Critically Reflective (INTASC 8 and 9) (75 points)***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Criteria | Level 1: C | Level 2: B | Level 3: Benchmark for A- work | Above and Beyond: A |
| ACEI 4.0  Analysis of Learning  ACEI 4.0  ACEI 4.0  ACEI 4.0  (40 pts-10 pts each) | \*One type of Assessment is used primarily for assessing student work  **2012: 0**  No clear connection between data and student learning  **2012: 0**  \*No rubric or plans for grading assignments provided to students  **2012: 0**  \*class overview comparison of pre/post test with no attention to individual objectives  **2012: 0**  \*little or no attention to student responses to HOT questions  **2012: NA (new for 2013 rubric)** | \*Both informal and formal assessments are used to assess student work; analysis includes student strengths and weaknesses  **2012: 7/18-38.9%**  \* Describes one data source understand learner needs and behavior  **2012: 4/18-22.2%**  \* Has criteria for assignments and assessment tasks; tasks evaluated and graded but no clear method present  **2012: 8/18-44.4%**  \* general overview of what students learned with one or two objectives addressed  **2012: 13/18-72.2%**  \*some mention of student responses to HOT questions  **2012: NA (new for 2013 rubric)** | \*Uses varied assessments to assess learning and modify instruction or learning goals (present or future)  **2012: 11/18-61.1%**  \*Uses multiple sources of information/data sources in order to compile a complete picture of what each student has learned.  **2012: 14/18-77.8%**  \*criteria for assessments clear and work graded fairly and transparently  **2012: 10/18-55.5%**  \*clear description of what objectives students understood and what objectives need to be retaught; all objectives addressed  **2012: 5/18-27.8%**  \*Detailed discussion of student responses to HOT questions  **2012: NA (new for 2013 rubric)** |  |
| Analysis of Assessment  ACEI 4.0  (10 pts) | \*Little or no discussion related to measurement issues  **2012: 0** | \*Some discussion or analysis related to measurement issues  **2012: 12/18-66.7%** | \*Assessments are evaluated with an understanding of validity, reliability, and bias and explicit use of the terms  **2012: 6/18-33.3%** |  |
| ACEI 5.1  Analysis of Teaching  (25 pts)  ACEI 5.1 | \* Analyzes his/her teaching and learning in a minimal or inaccurate manner  **2012: 0**  \* Little attempt to use problem-solving strategies to improve teaching practice and student learning  **2012: 0**  \* Limited evidence of supervisor or mentor teacher feedback in revised practice  **2012: 0** | \* Analyzes his/her teaching and learning primarily based on self  **2012: 3/18-16.7%**  \* Uses problem-solving strategies to improve teaching practice and student learning.  **2012: 5/18-27.8%**  \* Accepts feedback from supervisors and mentor teachers  **2012: 11/18-61.1%** | \* Analyzes his/her teaching and student learning broadly considering self, students, instrument and contextual factors  **2012: 15/18-83.3%**  \* Conducts continuous analysis and reflection on his/her teaching practices; makes timely adjustments.  **2012: 13/18-72.2%**  \*uses and documents in detail feedback from supervisors and mentor teachers and how this feedback was incorporated into teaching.  **2012: 7/18-38.9%** |  |

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***I. Competence: Planning (INTASC Principle 1,2,7,8)***

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| --- | --- | --- | --- | --- |
| Criteria | Level 1- C | Level 2- B | Level 3- | Above and Beyond-A |
| ACEI 3.3  Type of Thinking  ACEI 3.3  ( 3 pts each) | \* Lists various kinds of instructional strategies  \*no HOT question prompts provided | \* Uses a variety of instructional strategies  \*documents questions in lessons | \*Uses a variety of instructional strategies which promote higher level thinking and problem solving  \*documents HOT question prompts in lessons |  |

***Part II: Analysis of Learning and Teaching- Being Critically Reflective (INTASC 8 and 9) (75 points)***

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| Analysis of Assessment  ACEI 4.0  (10 pts) | \*Little or no discussion related to measurement issues | \*Some discussion or analysis related to measurement issues | \*Assessments are evaluated with an understanding of validity, reliability, and bias and explicit use of the terms |  |
| ACEI 5.0  Analysis of Teaching  (25 pts)  ACEI 5.0 | \* Analyzes his/her teaching and learning in a minimal or inaccurate manner  \* Little attempt to use problem-solving strategies to improve teaching practice and student learning  \* Limited evidence of supervisor or mentor teacher feedback in revised practice | \* Analyzes his/her teaching and learning primarily based on self  \* Uses problem-solving strategies to improve teaching practice and student learning.  \* Accepts feedback from supervisors and mentor teachers | \* Analyzes his/her teaching and student learning broadly considering self, students, instrument and contextual factors  \* Conducts continuous analysis and reflection on his/her teaching practices; makes timely adjustments.  \*uses and documents in detail feedback from supervisors and mentor teachers and how this feedback was incorporated into teaching. |  |