Ingenuity in the Pandemic: A Cross-Course Science-Literacy Integration Project

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Introduction: From your view

Respond at polleverywhere.com/bkiser

Introduction: Supporting Literature

Increasing pressures of accountability in elementary schools, with a particular focus on mathematics and English language arts, leaves little room for science education (Webb & Rule, 2014)

Reading from the textbook in United States middle school science classrooms is associated with low performance on the Trends in International Mathematics and Science Study (Su, 2014)

There is a need for science education worldwide to increase the level of cognitive demand upon our students (Calado, Neves & Morais, 2013)

The integration of science and literacy instruction in early years may be the beginning of this journey toward student success in future science education; thus our pre-service educators must be familiar with this process of integration in order to effectively teach it in their own elementary classrooms.

Visual Literacy

Topic	GLOWS	Grows
Weather vanes	*Activities with KAHOOT use great questions They used a lot of class discussions to help keep students informed.*	*More specific on class discussions and linking to the literacy standards*
Kinetic and Potential Energy	*Activities were great to use for each grade and allowed for different activities to work well with the content*	*More clearly explain their activities and the connection to the standards and how it is used virtually as well.*
Owl Pellets	*I really enjoyed the field trip idea for Kindergarten and using flipgrid as a good virtual assessment for students*	*Have more clear connections with the reading standards and how it will play a part in the lesson*
Gravity & Motion	*Using a graphic organizer is a fantastic idea They really help with students to learn more vocabulary, build on their knowledge and be used as a guide for help*	*Assigning the standards to the assessments and activities is again important. After all groups have gone I've noticed this to be a overall challenge for everyone*

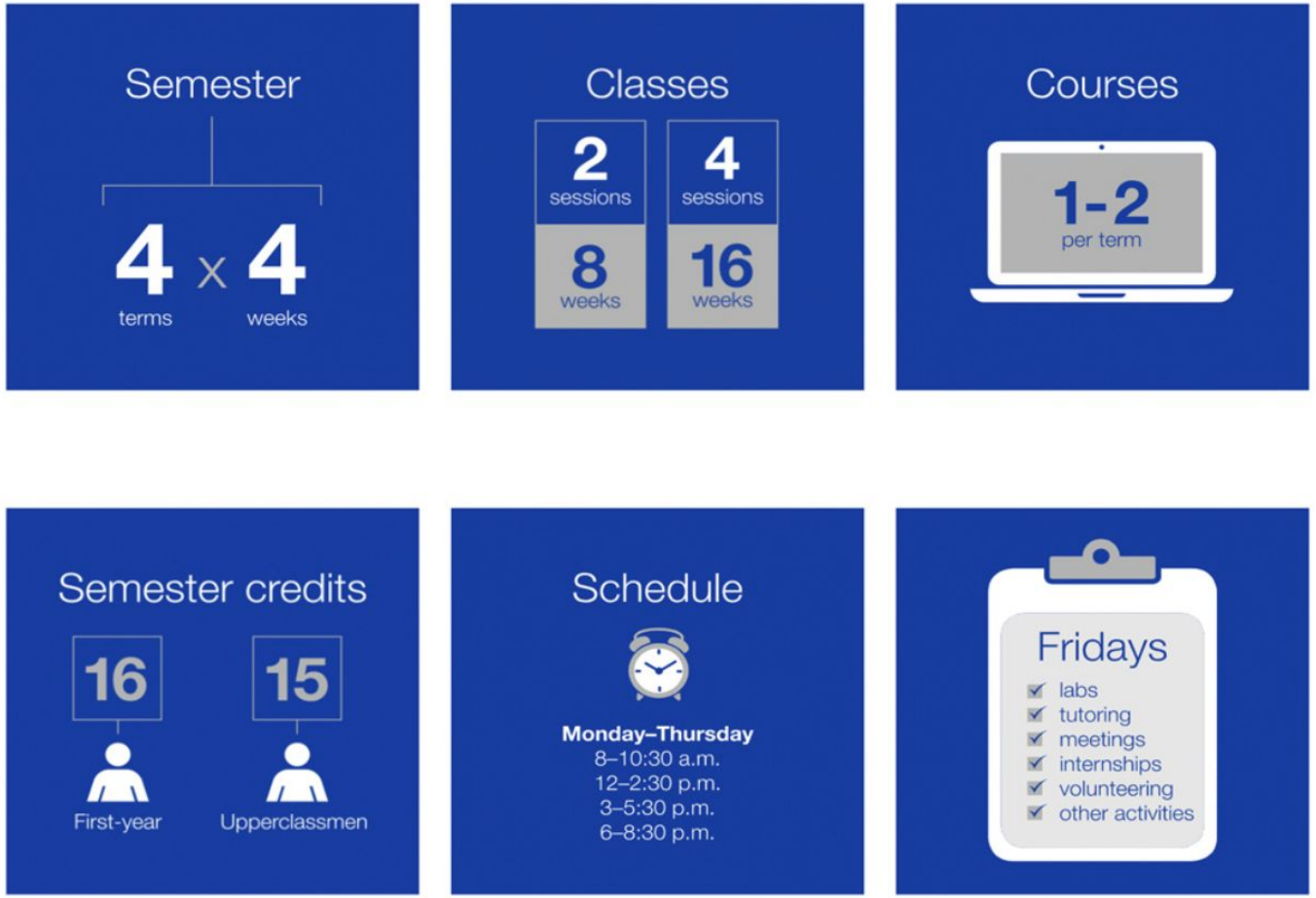
Topic	GLOWS	Grows
Wind	Their activities were relevant to the topic	Standards that aling and add more visuals
Weather	Very orgnized, books were relevant to the topics	Activities that are more easy or hard according to grade level
Owls	their activities were appropiate to the grade levels.	Standards were not aligned.
Gravity.	The assessments were appropiate and matched the standard.	reading portion and activities were off.

What's going on here?

What do you see?

(Herman, 2016)

Background: Schedule



(Carter-Tellison, 2022)

Background: Courses

Science in the Elementary School I

The purpose of this course is to provide meaningful and practical learning experiences that will prepare teacher candidates to create effective science learning environments for elementary school students. Teacher candidates will participate in the same kind of inquiry-based experiences that they will use in their own teaching with emphasis on applying the scientific process and proper laboratory procedures and student-centered instructions. Topics include earth and space science, life science, physical science and the nature of science. Eight hours of field observations required.

Literacy in the Primary Grades

Literacy approaches, methods and materials appropriate to teaching young readers in the primary grades are addressed. Emphasis will be on emergent literacy, sequential development of skills, perceptual development, word attack skills, vocabulary, comprehension and oral language development as all are a part of a balanced literacy approach to reading. Eight hours of field observations are required. Pre-service teachers will learn a variety of reading strategies and assessments to implement in their future classrooms.

(Lynn University, 2022)

The Approach: Collaboration

- Two classes, 24 students total
- Five collaborative groups of four or five students
- Groups contained at least two students from the literacy and two from the science course
- One, 150-minute class period on Zoom together for planning and introduction with modeled lessons
- Groups met in breakout rooms, with professor monitoring and assistance
- One, 150-minute class period nine days later for presenting

The Approach: Task

Student groups were tasked with developing six lesson activities, one for each grade level K-5, with each to include:

- an aligned state literacy standard
- an aligned state science standard
- an informational text which corresponded with the science topic and state literacy standard
- a virtual adaptation of the activity for the online classroom, appropriate for the grade level, which aligned with the state science standard, and
- an assessment addressing both content standards

Results: Visual Intelligence

Topic	GLOWS	Grows
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Let's take a closer look. Now what do you think you see?

What single sentence would you use to completely and accurately describe these visuals?

(Herman, 2016)

Discussion

Common themes:

- appropriateness of activity to grade level
- alignment of assessment to standards
- alignment of standards to grade level
- connection between informational text and science standard

Students did not understand how to combine standards that were cross-curricular and provide grade-level activities and assessments upon questioning and requested explanations.

Noted strengths:

- strong selection of informational texts to align with the science content
- incorporation of nature of science standards alongside the content standards (physical science, earth/space science, life science)
- interactive read-alouds which made good use of the strategies taught

Conclusion

When pre-service teachers are encouraged to work together in applying technology, science content and literacy strategies in an equally balanced lesson to state standards, students expand their understanding of all that is involved.

This presentation has described one such project of literacy and science integration, which has demonstrated the value of educating pre-service teachers in the art of integration, an impossible feat sans the successful collaboration of professors as well as students.

Questions or comments?

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Thank you for coming!

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