Designing a Creative Context that Fosters Student Motivation and Engagement in Learning

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ABSTRACT

Student attitudes and motivation play a significant role in their literacy learning (Turner & Paris, 1995). Good educators intrinsically know that the nature of motivational change depends, to a large extent, on the characteristics of the learning environment. When teaching students to become literate, it is important to balance affective and cognitive aspects of literacy development.

One way to achieve this balance is to create integrated instruction contexts that foster student motivation and engaged learning. This article describes an activity-based integrated aviation history context aimed at increasing student motivation and engagement in learning. This learning context is designed around multidisciplinary aviation themes in which curricular areas such as history, science, and mathematics were taught at the same time. It encompasses seven different instructional characteristics designed to engage students and cultivate greater learning environments.

Contexts that are intellectually stimulating and active places of learning pose challenging and developmentally appropriate problems for students. The learning environment should set up relevant investigations and encourage students to think about the results of these investigations. Inferences about student achievement, potential, motivation, and literate ability are made by assessing student work generated in the creative context.

INTRODUCTION

A creative classroom is ever changing to fit the learning activity. It reflects the enthusiasm of the instructor and the learner and yet it is one that welcomes new ideas, new thoughts, questions, and different ways of approaching a topic.

As educators, we intrinsically know that the nature of motivational change depends, to a large extent, on the characteristics of the learning environment in which students find themselves. Educational researchers agree that in order for students to develop into mature, effective readers and writers, they must possess both the skill and the will to read, write, and communicate (e.g., Anderson, Hiebert, Scott, & Wilkinson, 1985; Gambrell, 1996; Guthrie & Wigfield, 2000). When teaching students to become literate, it is important to balance affective and cognitive aspects of literacy development. One way to achieve this type of balance is to create integrated instruction contexts that foster student motivation and engaged learning.

Unfortunately, attitudes and literacy are not easily measured constructs. Consequently, educators have been hindered in creating learning contexts to foster motivation and literacy growth in their students. In recent years, educational researchers have made important breakthroughs in measuring affective elements related to literacy (Henk & Melnick, 1995; Bottomley, Henk, & Melnick, 1998). As a result, the impact that attitudes, desires, and motivations exert on literacy learning has begun to receive the attention it deserves. By addressing the research, the author has been challenged to design and implement an integrated instruction context that would foster long-term motivation and cognitive dimensions for literacy learning among his students.

THE CASE FOR THE CREATIVE CONTEXT

This article is based upon the author's reflective experiences as an Adjunct Professor teaching “History of Aviation” to freshmen students at a historically black college. The course was taught for four consecutive semesters during the academic years, 2000 - 2001. The history course was offered to undergraduate students majoring in Airway Sciences; however, any student was allowed to use the course to fulfill a history general education requirement.

Each semester, the course had a maximum enrollment of 30 students.

Of the 120 students enrolled in the classes, only 10 percent were aviation majors. The majority of the students were fulfilling a general education requirement. Approximately 70 percent of the students graduated from inner-city high schools in large metropolitan areas, such as Chicago, Detroit, Los Angeles, Dallas, New York City, New Orleans, and St. Louis. An informal survey conducted at the first of each semester determined only three or four students recalled talking about aviation in their high school classes. Of these, most remember talking about current events involving commercial aviation or the space program. None of the students knew of Bessie Coleman or the Wright Brothers and their accomplishments.

Color overhead transparencies were used as the primary presentation aid during the first semester of teaching the history of aviation course. During a typical class period, 20-25 transparencies were used to present the topic. After a couple of weeks, it was realized this mode of traditional classroom instruction had proved to be largely ineffective. The students, predominately freshmen and first semester on a college campus, were disengaged, unmotivated, and unchallenged. At times, absenteeism was as high as 30 percent and as a result, assignment and test scores for the majority of students were unsatisfactory. A learning site of numbing boredom and degradation, instead of growth and connection, had been created by the instructor.

Traditionally, instructors have required students to commit bits of knowledge to memory in isolation from any practical application. Most instructors still believe they must spend 90 percent of their instruction time on content. That only leaves 10 percent of their time on activity-centered learning (Parnell, 1995). Therefore, the element of hands-on, active experience is relatively absent, and little attempt is made to connect what students are learning with the world in which they will be expected to spend their lives. Often the fragmented information offered to students in this type of educational environment is of little use or application, except to pass a test. According to Parnell (1995), this is the freezer approach to teaching and learning. In effect, instructors are handing out information to their students and saying, "Just put this into your mental freezer; you can thaw it out later should you need it" (pg. 5)." With the exception of a few academically talented individuals, students just are not buying that offer. The majority of students fail to see any meaning in what they are asked to learn and thus, simply do not learn it. In this more traditionally structured, "learn this and you'll use it someday" style of teaching, students are simply not getting the message (Parnell, 1995, pg. 67).

How, then, can one provide an education as rich in experience as in knowledge, an education that will enable students to relate their education to the experiences and responsibilities that constitute a part of living for all of us? According to Parnell (1995), that question points to a key aspect of contextual learning goals: to provide an education that connects information and knowledge with real-life experiences. Young people of today and tomorrow need an application-rich, as well as an information-rich, educational program.

As personally witnessed in the classroom, the memorization of subject matter or being a "knowledge consumer" is not an effective or engaging way to spark a student's curiosity to learn aviation history. Teaching students to engage their literate abilities is more about asking questions and helping them find answers than telling them everything they need to know. Therefore, an educational environment had to be visualized in which students would be excited about aviation history - an environment in which the instructor could pose challenging and developmentally appropriate problems for students, help set up relevant investigations, and encourage them to think about what the results of these investigations mean to them individually.

Instructors in creative contexts recognize that one of the most important contributions they can make is to develop in students the attitude, the motivation, and the personality that will serve them well in the future. For example, it is not enough for students simply to learn a skill such as reading. Instructors want students to take pleasure in reading, to be engaged in the material they are reading, and find pleasure in this process of

learning. To develop this kind of attitude in literate abilities, instructors strive to make sure that students' work is engaging, interesting, and motivating. Student engagement is essential to the work the students do in their learning contexts. Engagement means there is an active involvement and commitment in the learning process (New-Learning, 2002). Engaged learners find excitement and pleasure in learning, and possess a passion for solving problems and understanding ideas or concepts. To such students, learning is intrinsically motivating.

Therefore, instructors must make certain that students are actively involved in hands-on performances, as well as indicate the students' interest level as an indicator of whether learning is likely to be going on within the context. The skill to master is being able to present educational materials and activities that motivate students, attract students, and involve students with the work, and yet is designed to meet high and compelling academic standards.

After researching various effective teaching practices, the author focused on creative integrated instruction contexts specifically designed to generate thoughtful and engaged learning. After a thorough review of the literature focusing on creative contexts, a hypothesis was formulated stating that a student-centered and project-based learning context can indeed foster student motivation and engagement. According to Parnell (1995), when students engage in activities that require them to use new learning, both their knowledge of content and literate abilities develop productively together.

DIMENSIONS OF THE CREATIVE CONTEXT

By focusing on three principal dimensions defined by Ritchhart and Blythe (2001), one is able to understand how to construct and assess a creative context. These principal dimensions are: (1) creative approaches to content, (2) creative and learning practices, and (3) cultivation of student and teacher creativity. By examining these dimensions, it enables an instructor to reflect on their own teaching practices and identify some of their strengths and weaknesses within the classroom.

The creative approach to content is directly related to the knowledge of the subject matter, aviation history. An instructor's understanding of, and passion for, aviation history must reveal itself in content organized in a way that encourages excitement, facilitates connections, and motivates learning for each student. Incorporating content that involves finding new ways for students to explore is important, because when students are able to grasp the clear understanding and application of the content, they can clearly see the understanding in what they are learning, and thus are motivated to learn.

Creative teaching practices must be both innovative and effective in order for students to acquire the knowledge, develop their literate skills, and deepen their understanding of the content (Ritchhart and Blythe, 2001). Therefore, one's own teaching practices must recognize the multiple ways in which students acquire knowledge and be able to encourage each student to draw upon their own unique style of learning. Incorporating innovative practices in the context provide motivation for student learning and often infuse the classroom with excitement and enthusiasm.

It is believed by the author that content is equally important with the context, but the context may well determine whether or not the content is actually learned. Knowledge that is simply poured into the student's mind, that in no way modifies student behavior or elicits a response, is likely knowledge gone to waste. Ideally, within the creative context an instructor wants students to do more than simply learn the curricular content and wants to do more than simply teach that content. In fact, the ideal creative classroom should cultivate the creativity of both the students and the instructor. To accomplish this, the instructor must assume some risk in incorporating open-ended projects and peer-led discussions into the context to encourage students to think for themselves and to develop original responses to the curriculum. At times, it is important to allow students to self-assess themselves within the learning environment. Students have unique ways of expressing themselves and developing personal

ownership of ideas. By taking some risks in the creative context, the instructor can identify and understand a student's unique style of learning and retaining knowledge.

DESIGNING THE CREATIVE CONTEXT

The context created for the author's aviation students encompassed seven different instructional characteristics designed to engage students and cultivate greater learning environments. These characteristics are (1) students are seen as partners in learning, (2) students have access to a wide variety of learning material, (3) students are encouraged to ask questions, (4) students have ownership in their own learning, (5) students have the choice and the freedom to learn and grow, (6) students experience collaborative learning, and (7) students share what they learn through their literate abilities.

The first thing the author discovered when developing the curriculum was the significant amount of time and effort it took to incorporate sixteen weeks of aviation history content into the learning context. When thinking only in terms of the amount of time such planning may take, one might easily feel that such time is not available. However, time is relative. It is much easier to find time to do the things that one likes than the things one detests. As mundane as it may seem, the author enjoyed the challenge of spending over 200 hours viewing, capturing, and editing video clips from VHS-formatted documentaries, biographies, interviews, NASA archival footage, and full-length movies. The intent was to embed these video clips into PowerPoint presentations. After weeks of viewing and editing, approximately fifteen hours of clips were selected to embed into the aviation history presentations.

Each PowerPoint presentation contained approximately fifteen to twenty minutes of hypertext video that allowed the instructor to access increasingly more in-depth information about a topic (North Central Regional Educational Laboratory, 2002). With hypertext, the instructor points the cursor and clicks on a portion of the PowerPoint slide, usually a historical photograph or animated clipart, to retrieve additional information on that topic. For example, in a presentation on airships the instructor provided the students with information about the Hindenburg. After briefly describing the airship, the instructor clicked on a photograph of the Hindenburg displayed on a PowerPoint slide. Immediately, a three-minute hypertext video appeared full screen portraying the historical video of the Hindenburg, including its 1937 fiery crash.

Even though it took approximately twenty hours to generate each weekly presentation (usually fifty PowerPoint slides), the author elected to use video clips because of the belief that visual images can be a powerful motivator. Motivating is a short step away from communicating as a mode of visual learning. Visual images play an extremely important part in the communication of information. The ideas and images that the students formulate from the videos become central to how well the students will understand the content. Therefore, once the instructor has the ability to communicate with visual images, the author believes, through personal experience there exists the opportunity to motivate a student's learning of aviation history.

Also within the context, the author displayed numerous instructional models and educational references. Various models of military aircraft, space vehicles and rockets were located in the classroom. Regardless of cost, all the models were student-friendly. The instructor expected students to handle the three-foot Saturn V model; dismantle it into stages; and inspect the service, command, and lunar modules. The author actually witnessed a student simulate an Apollo mission by "launching" the model from his desk, "dropping" stages while traveling around the classroom, and linking the service/command module with the lunar module. Large reference posters and fact sheets illustrating the Wright Brothers, the aerodynamics of flight, astronauts, and commercial aircraft were also displayed in the classroom. Lastly, aviation and space inflatables (airplanes, space shuttles, astronauts) and large kites (Red Baron's tri-plane and the Wright Flyer) were hung from the classroom ceiling for reference purposes. The students were allowed to fly the kites on windy days.

Throughout the semester, the students completed several interactive class projects. The students constructed an inner-tube box and demonstrated how Wilbur Wright envisioned maintaining equilibrium in flight simply by squeezing opposite corners of this box. The students assembled a balsa wood glider to determine how a plane is controlled in flight. Given prescribed flight paths to simulate with their gliders, the students taped ailerons, elevators, and a rudder to their glider to determine how an airplane's control surfaces control flight. In order to ensure student learning, the instructor talked with the students about how the activities or projects helped them to achieve personal learning outcomes. As a result, students knew not only what they were supposed to do but also why they were supposed to do it. A student who knows a project is supposed to develop understanding of the function of control surfaces is less likely to spend most of his or her time perfecting the appearance of their glider.

The students were also introduced to computer software that simulated the historic flight of the Wright Brothers. This simulation can be found on several Internet sites. The students were divided into six teams. As each team member performed their simulated flight, the instructor recorded the flight data – time and length of each flight. After each round of simulated flights, the teams were allowed to collaborate, regroup and strategize for their next round of flights. After each team member had flown the Flyer four times, the flight times and distances for each team were averaged to determine the winning team. By assessing student behavior during this activity, the author discovered this flight simulation enhanced engaged learning because the software provided challenging tasks, personal experiences, and collaborative opportunities for each student. It allowed each team to plan, reflect, make decisions, experience the consequences of their actions, and examine alternative solutions and assumptions.

The students also constructed a large Wright Flyer model using meat trays, balsa wood, popsicle sticks, and toothpicks. The completed Wright Flyer provided the student with a three-dimensional visual aid the student could reference throughout the two-week lecture on the Wright Brothers. By examining their model, the students visualized the concept of wing-warping; the position of the pilot, engine, and propellers; and the mechanics of the rudder and the elevator and how they controlled and sustained flight.

Lastly, each student was required to complete a research poster portraying an aviation pioneer or a significant event in aviation history. Their poster was to contain text and graphics. At the end of the semester, each student orally presented their poster in class. Oral, rather than written presentations allowed more thorough assessment of student creativity as well as a variety of literacy skills.

The highlight of the semester, according to the students, was the model rocket project. While exploring the history of rocketry and the dynamics of rocket flight, the students encountered various hands-on experiences aimed at promoting learning through scientific investigation. Each student collected, analyzed, and shared data about their own unique observations of rocketry as they studied the basic concepts of component placement, stability, propulsion, recovery systems, and experimental measurement.

Students spent two to three days constructing and painting their rockets. They had to assemble their model by reading and understanding a detailed set of instructions. Each construction step had to be followed precisely and chronologically; otherwise the completed rocket might not fly properly – if at all. Six students were grouped in work areas that allowed informal interaction with, and assessment of, each group as they worked. In talking with each group about what they were doing and what they were learning, the author witnessed potential and productivity as students navigated through each step of assemblage. Resourcefulness among the students was also witnessed as they collaborated and contributed personal understanding of the project. Throughout the project, each student had the opportunity to make their own choices, to direct their own learning, and to personalize their own work. To provide this opportunity, students were allowed to make their own discoveries as well as their own mistakes. If a student was not engaged

in the activity or chose to inefficiently use their time and energy, there was a good chance their rocket was not assembled properly or they did not get the opportunity to launch it.

Depending, of course, on the size of the rocket engine (amount of propellant) students chose, their rocket would ascend 300 to 1000 feet. Students determined an approximate altitude of their rocket by reading the angle off an altitude finder and multiplying the tangent of the angle by the distance from the launch site to the altitude finder. This activity not only incorporated mathematics, but it also required collaboration with a classmate operating the altitude finder. Intent of the model rocketry project was to improve literacy skills by involving students in reading, writing, and speaking as they responded to problems, experiments, and open-ended questions.

The model rocket project also allowed students the opportunity to learn collaboratively. It was a knowledge-building learning activity that integrated knowledge and experiences of the students, thereby stimulating more equitable learning conditions for everyone and giving everyone access to cumulative knowledge. Overall, the students were able to see themselves and ideas as others see them, could articulate their ideas to others, have empathy for others, and were fair-minded in dealing with each other's views. They had the ability to identify the strengths and intelligences of themselves and others.

As each one of these activities or projects was implemented into the context, the author was not in pursuit of having students create the perfect simulated flight, model rocket, or research presentation. The author was more concerned with the pursuit of learning. What matters most is what students create within the context, not what the instructor initially creates. Furthermore, it should be realized that more and better learning can take place within the context when the instructor is willing to step back and surrender some control. The author believes students become more engaged when they feel they have ownership of the learning situation. Rather than produce a creative environment that showcases the instructor's talents and abilities, the author's pursuit was to design an interactive and creative environment that would bring out the talents and abilities of students.

As mentioned, the author would periodically visit with students both individually and in groups in order to assess their work and learning. Sometimes the conversations were informal, while the students worked on an activity or project. Or they might be more formal occasions in which the author would conference with individuals out of class. Student assessment was a very important component of the learning context. According to Brown and Knight (1994), assessment is at the heart of the student experience. Assessment defines what students regard as important, how they spend their time and how they come to see themselves as students. The clues to what students are really learning are embedded in their work - in the assignments and projects they complete and the processes and conversations in which they engage while completing those projects. Work that students generate in a creative classroom can often be more individualized and complex than work generated in a traditional classroom.

Therefore, in addition to student visits, assessment consisted of taking a sample of what students did and valuing the worth of their actions. The sample included the completion of assignments and tests, solving problems and reporting their solutions, carrying out practical procedures related to activities and projects, and orally participating in class discussions. On the basis of the sample taken, the author made inferences about a student's achievements, potential, motivations, and attitudes. Lastly, an estimate of worth in the form of a grade was made at the end of the semester.

CONCLUSION

In the end, the author had designed a creative context around multidisciplinary aviation themes in which curricular areas such as science, mathematics, and history were taught at the same time. Furthermore, the students had the opportunity to interact with real objects, events, and activities by using their literate abilities, and by recording their experiences through writing, drawing, and assemblage. Throughout the semester, a variety of informational resources were provided within the contextual

environment, including video presentations, literary resources, computer simulations, learning models, theme posters, and exhibits. And the context was designed to allow students to work together in a variety of social environments, including individual work, small groups, and entire-class activities as they learned and understood the content relevant to aviation history.

Classrooms are powerful places. The author is convinced that the difference between classrooms is not in what is being taught, but how the instructor approaches the content. It is the integrated, activity-centered classroom that fosters student enthusiasm and the willingness to learn. If an instructor chooses to replicate this type of learning context for their students, it is suggested they consider implementing the above-mentioned seven instructional characteristics aimed at fostering student motivation and engagement. The simple thing is this same creative learning context can be adapted to teach a number of aviation courses.

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