MODELS OF INNOVATION & BEST PRACTICES IN TEACHING & LEARNING AT UND

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DEPARTMENT: Aviation

STRATEGY: Creative & Critical Thinking

CLASS(ES) AND CLASS(ES) SIZE WHERE UTILIZED SUCCESSFULLY:

- Honors 392/393: Transportation Today & Tomorrow (12 students)
- Aviation 302: Air Transportation (25-30 students per section per semester)
- Aviation 485: Senior Capstone (10-20 students per semester)

STRATEGY’S APPLICABILITY: WHAT KINDS OF STUDENTS, COURSES, LEARNING ENVIRONMENTS, ETC?

Aviation 302 is a required class for all aviation majors, although it is being phased out and replaced by the required aviation capstone class, which incorporates the successful elements of Aviation 302 outlined below. The framework of the strategy, however, is easily adaptable to any discipline's capstone or "state of the discipline" course.

ABSTRACT OR SYNOPSIS OF STRATEGY YOU ARE SUBMITTING:

Research indicates that teaching students by telling is not nearly effective as students personally connecting deeply and meaningfully with the material. Students retain more when they feel they "own" it themselves. I show how a traditional, chronologically structured course in any discipline can be converted to emphasize creative and critical thinking skills while simultaneously providing the required course content. In short, students immediately view the course and material as relevant, interesting, and fun.

Briefly, the semester is divided into four distinct learning blocks, each building on the last. The first block immediately exposes students to the current state of the discipline, focusing on current issues or problems. Students examine and create context for the issues by guided exploration and targeted presentation of issues by the professor. The second block springboards into ethical or professional issues raised by the current issues block, and the students shape and explore their own relationship with the course content through their own ethical lenses and others' perspectives. The third block gives perspective to the issues examined by rotating the focus of exploration to significant historical events of the discipline--not necessarily chronologically presented, but contextually relevant. By now the students have engaged with material relevant and close to their own experiences, explored differing perspectives, and placed those experiences in context of the larger discipline. For the fourth block, students will build upon those experiences and engage in highly creative thinking and critical analysis, working in groups to design and make something useful or valuable to the discipline, which is then presented for peer review. I have been surprised every time by the quality and originality of the projects, and the students are rightly proud of their work and evaluate the experience highly.

a) What strategy are you submitting? What inspired it and how did you develop it?
My inspiration for the course overhaul stemmed from being assigned it my first semester teaching at UND and hearing from other professors that students universally disliked it. I wanted to change the delivery radically to stimulate interest and inject relevance. Harnessing student energy was crucial for its success, and so I approached it from a problem solving perspective, modeling how new research is conducted in most disciplines—identifying a current problem, exploring its facets, reviewing literature, and creating a solution. I added ethics and professionalism simply because I have a particular interest in studying them.

To set the mood, I begin the class on the very first day by having an open and honest conversation with the class about the course. It seems to work best by asking them to get into small groups of 4-5, introduce themselves, and answer the following questions individually, then compare their answers, and finally elect a spokesperson to summarize them for me to write on the board for discussion:

*What do you want to get out of the course?*
*What can I do to help you achieve those goals?*
*What bad things have you heard about this course?*
*What interesting things or special knowledge do you bring to this course?*
*What are some annoying things from other professors and classes I should avoid?*
*What class rules should we set up?*
*Do you have any specific questions for me? They can be about the class, grading, personal background, or whatever.*

Inevitably someone asks what the course is all about, and I use that to discuss how the class is structured. I ask someone to take notes from the class discussion and I also collect the students' responses to the questions above. For the next class, I adjust the syllabus to accommodate any specific things the class negotiated on the first day and we review the changes. Doing that ensures buy-in from day one, and students seem much more willing to engage. I capture that mood with a creative ice-breaker for the beginning of the second class period. I have had good results by asking the students to make up a short story where their group must escape from the classroom, which has been locked up by an evil professor, using a few random objects I write on the board. They then act out their stories for the class.

I then leverage the class energy and new relationship bonds built up by the activity to explain the goals of the four blocks of the semester. The easiest way to convey that to the reader of this model is by presenting the syllabus itself, which I have edited slightly so as to work with any particular discipline:

**Course Design:**
The course is divided into four learning blocks, each of which will help you improve a discrete skill or knowledge set, and in combination which will prepare you for a successful career start, and a rewarding future.

Since no one can predict the future with any great certainty, and since most of you will hold many positions in [your discipline] and likely even change careers several times, a broad-based inquiry into the current state of affairs, ethical issues you may encounter, the history of the industry, and how you can distinguish yourself while working together to better [your discipline] is appropriate. To that end, you will be working in peer groups in each block of the semester. The four learning blocks will be structured as follows:
Block 1: The Current State of Affairs. Starting with a broad inquiry into [your discipline], we will explore current problems and issues and discuss the roles you and others play. Part of block 1 is the requirement for you to engage in conversation with experts in your discipline. To start this process, you must create a professional networking page on LinkedIn. You also need to join the class LinkedIn group by the due date on the calendar. The group page may be found by going to [html address] on LinkedIn. [For brevity, I have omitted the mechanical requirements of the LinkedIn assignment. The students work together in groups in class during block 1 on their pages. They must also identify, connect, and converse with others who are successful in their discipline via LinkedIn about current issues we identify in class. Their work and discussion threads can be evaluated via rubric, and any course content can be assessed with a quiz at the end of block 1.]

Block 2: Ethics: Problems & Issues. Block 2 will examine problems and issues facing [the discipline], especially ethics issues both present and forecast. We will focus on maintaining or improving [the discipline’s] ethical requirements in light of these problems and issues. At the end of block 2, your group will present an ethics problem and propose a solution. For your ethics presentation, please choose a topic that addresses an ethical issue or dilemma in [the discipline]. A sample list of topics is below [omitted]. You may select any topic that involves industry ethics or professionalism. You are not limited to topics on the list—it is merely a guide. After selecting a problem, you will critically analyze the problem and propose a solution. You must go further than merely reporting on it. Throughout block 2, you will work in peer groups to refine your presentation. You will be evaluated based on the rubric below [omitted]. [Again, the peer groups expand on ethics issues raised in class discussion, meeting approximately one class period out of every 3 or 4].

Block 3: A Brief History. A solid background in the history of [the discipline] is critical to full understanding of where we are today, and where we will go tomorrow. The perspective gained by exploring [the discipline’s history] is invaluable to you as industry professionals. During block 3, your groups will be responsible for creating essay test questions from the material we discuss in class and from movies shown in block 3. An essay exam will be given at the end of block 3, testing your knowledge of the materials we discussed. [I have omitted the specific requirements for the essay questions, as they can be tailored to any particular discipline or class requirements].

Block 4: Group Creative Project. The last block of the semester will be entirely devoted to creating something useful or meaningful for you or your colleagues in [the discipline]. In the interests of creative freedom, there are no restrictions on your project, other than your group must prepare and present something of substance that is useful to your colleagues in [the discipline] at the end of block 4. Since this is your “final exam,” your peer group will spend the majority of block 4 planning and executing a group creative project, culminating in an Executive Summary and Presentation. Your peer group will be evaluated via rubric on its dynamics, originality and creativity, presentation, and executive summary. You will meet regularly in class (and outside of class, if you choose) in furtherance of your creative project. The expectations for your peer groups are set out below [omitted--these can set up to fit any particular situation]. Working toward the final project, peer groups must submit several short progress reports. The requirements for your executive summaries and presentations will be given in a separate document. [In the last block most of the class periods are devoted entirely to guided group research, where your role is limited to suggestions and hints when students ask. It is helpful to bring the class together a few times for status updates from the groups--it keeps the energy levels high.]
b) What do you want students to know or be able to do as a result of your teaching strategy? How do you know that learning occurred?

My goals for the course are for students to create their own frameworks for understanding. Too often I see traditional models used where teacher tells and student regurgitates, but then retains almost nothing a short time later. By encouraging students to pool their creative resources and energy and shaping the class in a way that is relevant to them, I see students not only retaining content, but also concrete evidence of learning--two of my students have gone on to market and sell concepts or inventions they started building in the block 4 creative project. Numerous others have reported successful career advancement directly as a result of the LinkedIn connections they made. Finally, in formal course evaluation and SGID evaluations, I have received particularly strong validation of the course. Here are some comments from students:

"Our final project brought together everything we had learned the semester to invent or improve something in the industry. It brought together all we had learned during the semester and made us do research just we will have to do in the real world when we graduate."

"I liked the group project. It encouraged us to think of something new, not just learn from others."

"Great class! Vacek turned a class that I had heard bad things about into one of my favorite classes I have taken in college. It was engaging, fun and enjoyable."

c) Is there any other information that will help us determine the suitability of your strategy for this project?

This framework is adaptable to many disciplines and capstone courses. Although it requires flexibility from those teaching it, it seems to work for a variety of teacher styles, as well. I find I learn at least as much from the students during the semester as I think they learn! And finally, the framework seems adaptable to any level of teaching technology, and even has been tested successfully once in a distance course.