Teaching Students to Visually Model Community Responses to Opioid Crisis

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The policy course in the public administration curriculum at the graduate level tends to focus on policy making at the national level and the major areas of policy, such as health policies, foreign policies, and economic policies. Relatively few students in a master's of public administration (MPA) program at a regional university like Albany State University in southwest Georgia will become policy analysts or complete terminal degrees. They are more likely to become employed in a small city or rural place as a city administrator or a leader in a department of local government. Suddenly concerns like those involving macroeconomic theory or international diplomacy are less relevant. What matters is thinking clearly about social problems, policy goals, the critical success factors of government programs, possible actions, and the anticipation and mitigation of likely unintended consequences of government actions.

The MPA Program

The master's of public administration program at Albany State University began in the late 1980s and has had around 50 students (including both full time and part time) through the years. There are five core faculty members, including the Program Director. The program is professionally accredited by NASPAA. Completion of the course requires 36 credit hours, including core courses. It is a traditional face-to-face program and classes meet in the evenings for the convenience of students.

The Public Policy Course

The public policy course (PADM 5781) is a required core course in the MPA program. It is an introductory course with a broad and general course description. The textbook this semester is titled, "An introduction to the policy process: Theories, concepts, and models of public policy making (4th edition) by Birkland. When I teach the course, the first half of the course has traditional public policy course content, including usual stages of policy processes and traditional

actors in policy processes. In the second half of the course, I focus on the visual modeling of public policies and their implementations.

The Challenges of "Wicked" Social Problems

A wicked problem is one that is difficult or impossible to solve because of its complex interdependencies. Many of the wicked social problems faced by small communities and other political jurisdictions are likely to persist despite attempts to address them. The problem is not likely to be solved and concluded. The problem is likely to persist "forever" because of its complexities and underlying origins. Poverty and homelessness are examples of wicked problems. While these problems can be described, they are likely to continue or even increase locally as local efforts to address them are implemented. A place that provides well for homeless people is likely to attract additional homeless people and families from other places.

The present opioid crisis is being experienced in small and large places across the United States and beyond. Governments are unable to stop the production and distribution of opioids and other addictive drugs. In a world of physical and mental pains (and social pressures including through social media) governments cannot stem the demand for opioids or easily wean people already addicted from continuing to acquire and ingest opioids and similar addictive drugs, from sources both legal and illegal. Efforts to help people already addicted are likely to signal to young people not already addicted that use of such drugs is acceptable. This crisis was substantially triggered by major pharmaceutical companies claiming that their opioid products for pain relief were safe and not addictive. Now, the attempt to limit legal prescriptions has fueled black markets in which fentanyl and other drugs and substances are being produced and sold. First responders are saving many lives but the people they save are likely to continue to use such substances because they are addicted. But repeatedly saving the lives of the same

people in a community of any size is costly and probably cannot be sustained over time. A person who takes opioids or similar substances repeatedly is likely to die prematurely.

The Instructional Benefits of Visual Modeling

The human brain has capacities to process both sequential input (such as text, spoken or written) and gestalt input (images such as pictures and graphics). Processing sequential input is said to be more of a "left-brain" function. Processing visual content is said to be more of a "right brain" function. Each of these capacities contribute to reason and to critical thinking. Words allow precision of meanings and expressions that visual images do not convey. Images facilitate the perception of complex sets of relationships.

Wicked social problems, such as the challenge of a community trying to address opioid addictions, cannot be effectively perceived in only sequential ways. Visual modeling is widely used today in the design of complex software applications. In the old days, procedural software languages fostered a kind of sequential thinking characteristic of COBOL programmers. With the advent of object-oriented programming languages, programmers used visual development interfaces to both think about their programs and to actually let the interface generate programming code in the background. Most modern software applications probably could not have been created without visual programming techniques. Visual modeling enables programmers to literally "see" their work in a way that procedural programming does not allow. Visual models can also be an effective way for programmers to communicate with one another and to collaborate to build complex computer applications together.

Visual modeling is also valuable in other domains. For example, Goldratt's Theory of Constraints draws upon use of visual models to address a variety of types of difficult problems, including the optimal design of manufacturing production facilities (Dettmer, 1997). Architects,

of course, use standardized notations and visual models to create and communicate the design of new buildings. The design sciences involve both the sequential use of words and the gestalt qualities of visual resources (Simon, 1996).

The Assignments

My intent in the course is for students to learn to produce and interpret visual models similar to the one shown below. The goal is the essential problem that a public policy and its implantation intends to address. Goals tend to be hierarchical in nature and it is important to define the scope of the problem to be addressed. For example, the goal shown in Figure 1 is to reduce red-light running at traffic intersections. If the goal was to reduce traffic accidents at intersections, the reduction of red-light running would likely to become a critical success factor (CSF).

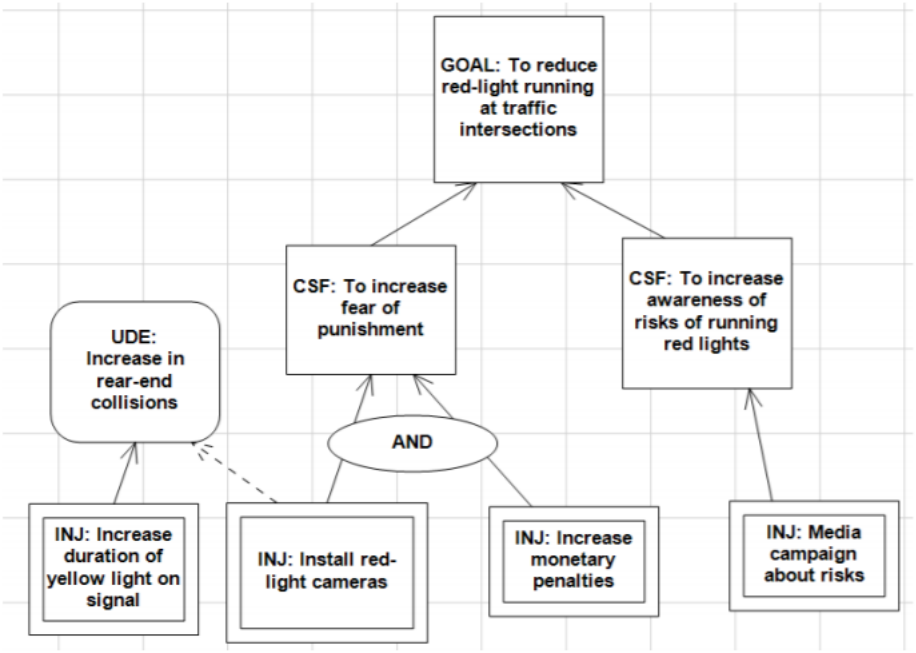

Figure 1: Simple Visual Model of a Public Policy Strategy

The essential things I try to teach my students is how to use visual modeling to identify a goal and an associated small set of critical success factors. This is an exercise in dividing a

difficult problem into its parts or aspects. In the context of computational thinking, this is decomposition. Then students need to identify the steps or activities necessary to address each critical success factor. In the context of computational thinking, this is a part of abstraction and algorithmic thinking. Then it is important to identify which pairs of sets of government actions are required together (an AND visual stereotype) or situations in which one but not both actions are necessary (an OR visual stereotype). It is also necessary to identify the unintended consequences of particular government actions and to identify ways to prevent or reduce those consequences. In the context of computational thinking, this is analysis (solution execution and evaluation).

Student Experiences

I am presently teaching the course and cannot report findings for this semester yet. When I taught this course last semester I found that students learned to interpret visual models but had difficulty with the creativity and domain expertise needed to create them effectively. I believe that systems thinking and critical thinking in this context require that students be able to both interpret and create this kind of visual model in a policy domain they have knowledge of.

Conclusion

The major challenge I am facing is how to teach students to actually apply critical thinking skills necessary to create such models on their own. I suspect that the answer may reside in the literature on teaching computational thinking. Public administration as presently taught is not a design science. It needs to become a design science, in my opinion. Public administrators and elected leaders and others make important decisions that shape the future and affect the lives of every person on the planet. Politicians are driven by the desire to be reelected frequently. Elections do not allow voters to express their deep thoughts about how to address wicked

problems in the long term. Lobbyists do not usually speak for those in the distant future and do not generally attempt to address problems except from the perspective of the interest groups that employ them. Public administrators are expected to speak for the interests of their respective agencies. But if anyone close to policy decision making is likely to speak for future generations and to try to actually solve problems rather than represent interests, it may be public administrators. I am trying to take a step in the direction of helping public administrators of today and the future to understand important social problems, including how communities can respond to the opioid crisis, with a systems perspective and the eyes and minds of designers.

References

Dettmer, W. H. (1997). *Goldratt's theory of constraints: A systems approach to continuous improvement*. Milwaukee: Quality Press.

Simon, H. A. (1996). *The sciences of the artificial* (3rd ed.) . Cambridge: MIT Press.