Building Bridges: Simulations as Pedagogical Paths to Higher-Level Learning

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Abstract:

How often have educators heard students complain that they will never use what they are learning? While those of us who dedicate ourselves to teaching would like for our students to appreciate the inherent value of learning regardless of whether it translates into immediate practical use, most educators today would accept that incorporating an experiential component in the classroom enhances a course’s material and, more importantly, the students’ understanding and retention of the subject matter. This paper reviews the literature relating to the idea of active or experiential learning broadly, the use of simulations as a specific type of active learning, and its specific implementation in the field of political science. It then relates these academic arguments to the observations of the author based on her experience coaching a cyber policy team in several crisis simulation policy competitions and discusses her intent for incorporating a simulation into the elective she is currently teaching.
“The mind is not a vessel to be filled, but a fire to be kindled.” – Plutarch

“One must learn by doing the thing, for though you think you know it – you have no certainty until you try.” – Sophocles

“True teachers are those who use themselves to build a bridge over which they invite their students to cross; then, having facilitated their crossing, joyfully collapse, encouraging them to create their own.” - Nikos Kazantzakis

Learning by Doing

How often have educators heard students complain that they will never use what they are learning? While those of us who dedicate ourselves to teaching would like for our students to appreciate the inherent value of learning regardless of whether it translates into immediate practical use, most educators today would accept that incorporating an experiential component in the classroom enhances a course’s material and, more importantly, the students’ understanding and retention of the subject matter. Indeed, the proliferation of projects-based evaluations, simulations, policy competitions, war-gaming exercises, and internships signals a broad appreciation for the value of experiential, or active, learning as a key component of higher education. Rooted in John Dewey’s progressive approach to education outlined in his seminal Experience and Education, this pedagogical approach purports to prepare students for the unknown and complex challenges of a world in flux.1

This paper reviews the literature relating to the idea of active or experiential learning broadly, the use of simulations as a specific type of active learning, and its implementation in political science curricula. It then relates these academic arguments to the observations of the author based on her experience coaching a cyber policy team in several crisis simulation policy competitions and discusses her intent for incorporating a simulation into the elective she is currently teaching.

Active Learning: A Broadly Accepted Pedagogical Theory

Even in the storied halls of the nation’s oldest universities, those most beholden to traditional methods of instruction such as lecture and seminar-based discussion of classic texts, educators have come to accept the critical role of experience in the learning process. Alternatively referred to as “experiential learning,” “active learning,” and “learning by doing,”2 this pedagogical approach demonstrates a “general acceptance of interactive activities as more

effective teaching methodologies than standard didactic instruction.”

It places the student at the center of the learning process, asserting “that the students’ job is to learn and the teacher’s job is to help the learners to learn.” Teachers are meant to assist students in the “process of building, testing, and refining their mental models with the goal of understanding the subject matter at hand” and being able to apply this understanding to new situations. Teaching practices of this sort “include those that focus on sense-making, self-assessment, and reflection on what worked and what needs improving.” In this way, students are encouraged – indeed, forced – to take ownership and control of their own learning such that they will be able to apply it more effectively in the future.

For example, Yale University’s famed “Grand Strategy” program features a crisis simulation as its final evaluation. This program is an intensely selective, interdisciplinary program taught over three semesters that seeks to educate future leaders to face the world’s most pressing strategic future challenges. Throughout these three semesters, students learn through more traditional methods, reading classic texts, engaging in classroom discussion, and writing research papers. However, the emphasis placed on the final crisis simulation – an intense experience that takes place over the course of two full days of a weekend – illustrates the importance the program’s faculty, some of Yale’s most illustrious professors, place on the role of experience and active learning in confronting complex problems. As one of the program’s architects, Professor Charles Gaddis, expresses to the students upon the conclusion of the exercise, “We hope there is something that sticks with you, and we hope you will find ways to reap its rewards in ways that you cannot anticipate now.”

The fundamental argument in support of experiential learning assumes that learning is contextual and that the ability of students to transfer the knowledge they attain in the classroom towards practical use to solve real-world problems relies heavily on the context in which they learned the material. As Svinicki and McKeachie assert, “If you want students to be able to transfer what they learn to the real world, it helps if the learning takes place under conditions that approximate the real world.” According to this logic, assigning readings and discussing concepts in abstract terms will do little to prepare students to actually put these principles into practice. Rather, students need to learn the material in a context that mimics the context in which they will need to put those principles into practice.

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3 Sands and Shelton, “Learning by Doing,” 133.
4 Joel Michael, “Faculty Perceptions about Barriers to Active Learning,” College Teaching 55, No. 2 (2007): 43.
5 Michael, “Faculty Perceptions about Barriers to Active Learning,” 43.
7 Linda Kulman, Teaching Common Sense: The Grand Strategy Program at Yale University (Westport: Yale University, 2016), 187.
9 Svinicki and McKeachie, McKeachie’s Teaching Tips, 204.
According to Svinicki and McKeachie, the ideal approach to experiential learning incorporates real-world situations, problems, equipment, or actions; … involve complex, ill-defined problems that don’t have a simple answer and may even have more than one possible answer; … involve the learners in solving a problem that reflects the kinds of problems they would encounter in the real world using the tools of the discipline; [utilizes the instructor as] a resource, but not the leader of the problem-solving task; [and] when the learners have come to a solution, they spend an equal amount of time reflecting on how they reached their solution and getting feedback about the quality of their proposed solution.10

However, they recognize that these components can be hard to integrate into every instance of experiential learning and thus allow for less elaborate alternatives that can still achieve similar learning objectives. The authors separate experiential learning into three broad categories: case-based, problem-based, and reality-based.11

The case method, often used in business and law schools, asks students to evaluate an actual situation or event in the field and thus “represent the best possible portrayal of that environment that can be made without actually being there” and are “intended to develop student ability to solve problems using knowledge, concepts, and skills relevant to a course.”12 Another advantage to this format is that students – once they have gone through the exercise of defining the problem, developing hypotheses about its causes, gathered evidence to support or discount those hypotheses, and made appropriate recommendations – students can compare their solution to what was done in the actual case. This can lead to a particularly productive analysis and discussion.

Another approach, known as problem-based learning, achieves many of the same objectives as the case method, but allows for more creativity and flexibility. This method provides students with much less information than the case method, forcing them to determine how they will address the problem rather than critique another’s approach.13 The most common manifestation of this method is known as “guided design” and is essentially the application of the scientific method with particular “emphasis on assessment of constraints, costs, benefits, and evaluation of the final solution.”14 This reflective component, according to Svinicki and McKeachie, is especially critical to the learning process in that it helps develop the students’ ability to self-assess and encourages the habits of lifelong learning.

The problem-based method is most often implemented through the use of games, simulations, or role-playing activities. These offer the advantage of incorporating students as

10 Svinicki and McKeachie, McKeachie’s Teaching Tips, 204.
11 Svinicki and McKeachie, McKeachie’s Teaching Tips, 203.
12 Svinicki and McKeachie, McKeachie’s Teaching Tips, 205, 206.
13 Svinicki and McKeachie, McKeachie’s Teaching Tips, 208.
14 Svinicki and McKeachie, McKeachie’s Teaching Tips, 208.
“active participants rather than passive observers.” One caveat to note with this method is that students need to have a base level of knowledge in the course material in order to get the most out of this experiential approach. As Jackson Kytle notes in *To Want to Learn*, students need to have gained some conceptual knowledge in order to maximize the value of the experience and “requires additional and *intentional* steps before and after having had a powerful experience.” That is, students need to have the conceptual tools at their disposal in order to effectively address the problems these exercises will ask them to solve.

Finally, the third approach to experiential learning, known as reality-based, requires students to participate in some sort of real-world application of the course’s concepts. Though the most common version of this style of experiential learning is the internship or field research experience, another common approach incorporates “‘service learning,’ an instructional situation in which students take the skills they are learning and put them to use in real service projects in real community projects.” Through this community service, students are able to fulfill specific learning goals while also contributing to their community. These projects are useful for lower level courses that do not have the time or resources to allow for the fully immersive experience of an internship or field research.

Experiential learning, therefore, can take various forms in practice. Regardless of the specific tool used to implement experiential learning, the approach places the student at its center, empowering them to take control of their learning and emphasizing the process of self-assessment and self-reflection in the application of conceptual knowledge to addressing real-world challenges.

**Simulations as an Experiential Learning Tool**

Though experiential, or active, learning can take many forms, one of the most effective methods through which to teach and reinforce concepts in the social sciences is through simulation. Dorn defines simulations as

> activities undertaken by players whose actions are constrained by a set of explicit rules particular to that game and by a predetermined end point. The elements of the game constitute a more or less accurate representation or model of some external reality with which players interact by playing roles in much the same way as they would interact with reality itself.

Simulation games offer the advantage of representing reality while allowing for flexibility in how that “reality” is constructed. Simulation models generally “contain important parts of reality but not all of reality.” Simulation designers can tailor the

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17 Svinicki and McKeachie, *McKeachie’s Teaching Tips*, 211.
model’s size, conceptual scope, and rules based on the number of participants, the
learning objectives of the exercise, and the time allotted to the simulation itself.
Simulations can also vary in their format, “from computerized games to elaborate, role-
playing scenarios.”19

Simulations are touted as an effective teaching tool because they “make learning a
matter of direct experience,” ostensibly increasing students’ motivation and interest in the
subject material and therefore enhancing the overall learning environment.20 Various
studies provide evidence “that simulation games generate high levels of interest and
motivation among students.”21 Similarly, other studies have shown that “simulation and
role-playing exercises increase student interest in politics and stimulate greater
understanding of political actors and processes.”22 One can reasonably conclude,
therefore, that simulation games, if designed well and towards the appropriate learning
objectives, can greatly enhance students’ overall learning experience and are therefore an
important pedagogical tool.

This logic is based on the assumption that integrative experiences that offer
students an opportunity to actively engage in the learning process and apply conceptual
knowledge to new situations are the most effective learning environments.23 As one study
points out,

Simulations do not necessarily test the students’ ability to recall
factual information or summarize previously learned course content.
Instead, the simulation requires students to apply the course content to a
new, relatively realistic context in order to weigh policy alternatives, draw
upon the various course components in order to formulate an argument,
and make judgments regarding the “best” alternative.24

Rather than emphasize knowledge and comprehension, simulations focus on what Bloom
famously characterized as higher-level learning objectives: application, analysis,
synthesis, and evaluation. Simulations are therefore most beneficial when incorporated at
the end of a course or once students have acquired a foundation of conceptual knowledge.

In one study, a professor conducted a survey of over 200 students to determine
whether a role-playing simulation effectively provided an opportunity to engage in these
higher-level learning practices. The survey asked the students to “reflect upon and self-
assess the impact of the simulation on their own learning [and] is thought to be the most
appropriate approach to understanding the impact of the simulation on higher-level

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22 Zaino and Mulligan, “Learning Opportunities in a Department-Wide Crisis Simulation: Bridging the
learning.”25 His findings show that role-playing simulations do in fact help achieve Bloom’s higher-level learning categories. An overwhelming percentage of students “reported that the simulation did in fact help them apply concepts learned in class to ‘real’ situations,” thus achieving the application learning objective.26 On average, students also agreed that the simulation “helped them think through policy issues and to confront the trade-offs between different perspectives,” thus developing their analytical skills.27 Students also felt the simulation forced them to synthesize information by drawing on a variety of concepts discussed throughout the course to develop an argument. Finally, 94% of respondents indicated the development of evaluation skills through “the opportunity to make judgments about different policy alternatives.”28 This study’s result point overwhelmingly to the value of simulations in achieving higher-level learning objectives.

Beyond the broad educational advantages they offer, simulation games are especially valued in the social sciences because they require extensive interaction among the students themselves, thus helping develop skills of empathy, leadership, and general group dynamics.29 They have also been shown to improve interpersonal skills, self-confidence, and decision-making abilities.30 In Silvia’s study, role-playing seemed to “provide a vehicle for personal growth and increased awareness of others that traditional teaching techniques have a difficult time replacing.”31 In a field in which interacting with others is so critical to success, this method of teaching offers some obvious advantages by providing some of the more practical skills necessary to be successful as a practitioner in the field.

Given the educational and developmental advantages simulation games seem to offer, it is no wonder they have become increasingly popular as pedagogical tools, especially in the social sciences. Surely, they merit consideration for incorporation into all higher-level electives that require an appreciation for the interrelatedness of topics and “the complexity inherent in the real world.”32 Once students have acquired the base level of conceptual knowledge in a particular field, they should be given an opportunity to apply these principles to address complex challenges that require higher-level learning skills.

29 Dorn, “Simulation Games,” 5.
31 Silvia, “The Impact of Simulation on Higher-Level Learning,” 413.
Learning Cyber through Policy Simulations

In my short two years as an instructor in the Department of Social Sciences, I have had the opportunity to become involved in various extracurricular activities developing cadets intellectually outside of the classroom. One of the most rewarding and challenging has been my role as a coach for the Cyber 9/12 Policy Competition Team. Hosted by the Atlantic Council, the Cyber 9/12 competitions present the competing teams with hypothetical, but realistic, scenarios of a cyber-attack and ask the teams to develop policy recommendations in response to these events.

The competition fulfills the criteria of a simulation by placing the cadets into a hypothetical role, constraining their actions and recommendations by a set of rules, and mimicking reality while allowing for a flexible design that need not replicate reality exactly. The competition requires its participants to apply their technical cyber knowledge, understanding of cyber policy, and the roles and responsibilities of applicable government agencies to solve a complex problem. The competition occurs in various rounds, with more information about the cyber-attack and relevant actors being revealed with each subsequent round. This format allows the competitors to self-assess their recommendations and make refinements to their mental models and recommendations. Thus, this style of competition meets the criteria of a simulation game as outlined previously in this paper.

In my experience formally coaching two teams and assisting in the preparation of two more, this format of competition is a highly effective method of achieving higher-level learning objectives. Admittedly, teams must possess a fundamental level of technical and/or policy knowledge to be able to understand the scenario, interpret the facts they are presented, and develop feasible policy recommendations. However, the most successful teams are those that are able to leverage a wide array of concepts from a variety of disciplines and synthesize them in the formulation of a recommendation that reflects the interconnectedness and complexity of the issue. For example, the team that won the inaugural Indo-Pacific Cyber 9/12 Student Challenge in Sydney, Australia in September, 2017 featured four cadets majoring in disciplines as varied as International Relations, Chemistry/Life Science, Computer Science major, and Geography. However, each cadet had previous experience competing at the national level and had participated in extensive preparation and rehearsals leading up to the competition.

Undoubtedly, each cadet would attest that, regardless of how many rehearsals the team conducts leading up to the competition, little can fully prepare them for the specific issues of the final scenario and the stress of developing and presenting policy options in a time-constrained environment to a panel of expert judges. They would surely confirm that the vast majority of their learning occurs during the late night strategizing they conduct in between rounds, in the frenetic fifteen minutes they are allotted before the final round, and during the question and answer session with the judges at the end of their presentations. It is in these realistic, high-stress situations that their ability to apply, analyze, synthesize, and evaluate is truly tested. Though I haven’t had the opportunity to conduct a formal test of theses simulations on the development of each team’s higher-level cognitive skills, my experience in observing the pace and amount of
learning that occurs during these events has convinced me of the value of simulation games as a pedagogical tool.

It is this experience that led me to incorporate a simulation exercise into the elective I am currently teaching. SS76: Conflict and Negotiation asks cadets to engage with the theoretical literature explaining the causes of civil war and its termination, then leads them through a block of instruction exploring the practical challenges associated with third party mediation and post-conflict management of inter-state conflict before asking them to apply these concepts to the explanation of various case studies. Given the complex and interdisciplinary nature of this field of study – with its incorporation of international relations, comparative politics, economics, psychology, sociology, and organizational theory – this course is particularly well-suited to the benefits of a simulation exercise.

I have therefore solicited the assistance of the United States Institute of Peace, a nonpartisan institute dedicated to the reduction of violent conflict with vast experience mediating peace talks and training both American and foreign government agencies and decision-makers, cadets will participate in a simulation game in which they will be assigned a variety of roles associated with the Afghan conflict and charged with developing a peace agreement between the Afghan government and the Taliban. Though I have no illusions that they will actually forge an agreement, I am hopeful that this experience will provide them an opportunity to apply the concepts we have been discussing throughout the semester, analyze the effectiveness of various approaches, synthesize what they have learned towards a feasible solution, and evaluate its potential effectiveness. That is, I hope this simulation will serve as the exercise in which they begin building their own intellectual bridges.


