

Enhancing Concept Learning: The Simulation Design Experience

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***Editors' Note:** Druckman and Ebner carefully review a large number of studies which conclude that simulations (in all fields, not just negotiation) typically fail to live up to their promise. One quirk of the studies, however, drew their particular interest and inspired their own research: it seemed that students who designed simulations learned more than those who participated in them. Druckman and Ebner use this clue to develop a different kind of negotiation simulation – one in which the student plays the role of a teacher, and designs an exercise.*

Introduction

Role-plays and simulations¹ have long been considered a central element in negotiation pedagogy, as well as that of the wider field of conflict resolution (Ebner and Efron 2005, Druckman and Ebner 2008, Alexander and LeBaron 2009). Perhaps one reason for this is the fact that the early roots of negotiation education developed during a period, beginning in the 1960s, in which experiential learning began to gain momentum and acceptance, particularly in the social sciences. Indeed, some of the earliest examples of widely used simulations in the social sciences included either negotiation or specific related elements such as cooperation vs. competition, interdependence and communication.²

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As simulations are intended primarily to enhance learning benefits for the role-players participating in them, a top-down approach was adopted regarding their design; teachers or simulation-experts designed simulations for student-participants. By providing realistic, but controlled, environments in which students are guided by implicit rules, as well as explicit constraints, teachers provide students new venues to accomplish learning objectives by applying a body of theoretical knowledge in practice.

Precise design of these venues is paramount, in order to ensure that students are exposed to designed stimuli that encourage them to acquire the key concepts of the subject area being taught or the specific technical skills for which they are being trained. The effort to conceptualize what needs to be considered while designing educational simulations is evident in several early treatments of the design process by Richard Duke (1974, chapter 5), Cathy Stein Greenblat and Duke (1975, part II), Michael Inbar and Clarice Stoll (1972, chapter 17), Henry Ellington and colleagues (1984), and Ken Jones (1985). These authors provide systematic step-by-step guidelines for conceptualizing, constructing (scenario development), and implementing simulations. For the most part, the focus is on the educator-designer who, familiar with learning goals and participant proficiency, creates a training world for his or her students. However, as important as the issue of the perfect design process is, a more fundamental question demanded (and continues to demand) center stage in the literature on simulation games: is learning with simulations and games really effective?

Simulations as Teaching Tools: Do They Deliver the “Goods?”

In the fields of negotiation and conflict resolution, the question of the efficacy of simulation-games seems almost moot; ask any negotiation educator whether use of simulation as a training tool is beneficial, and odds are they will tell you it is. This is obvious from any review one could make of course syllabi and training plans. However, while little has been done to measure the effectiveness of simulations for learning in this field, there is a large body of research focusing on this in the literature of the fields of education and the social sciences, and a large number of evaluation studies have provided information about the learning and motivational outcomes of simulation participation. In a recent review conducted on the research regarding simulation evaluation, we discussed the overall themes presented by these studies (Druckman and Ebner 2008).

In brief, the findings we presented showed that an overwhelming majority of studies conducted since the mid-1960s indicate that

simulations do *not* live up to the notions held in their regard by the many educators who use them (for more on these notions, see Kovach and Ebner, *Simulation 2.0*, in this volume). Students learning through simulation showed no better outcomes than students learning through other methods regarding the degree of learning or thinking critically about the material. Simulations *did*, however, enjoy an advantage in two important areas: some studies suggested that students learning through simulations retained the material longer than students learning through other methods. Additionally, simulations repeatedly scored higher on student motivation. "Motivation" has been approached in different ways, in separate studies; this term seems to be wide enough to capture elements such as student interest, commitment, positive attitude towards the material, and desire or willingness to engage in a similar activity again (see Cherryholmes 1966; Pierfy 1977; Bredemeier and Greenblat 1981; Randel et al. 1992; Ellington, Addinall, and Percival 1998; Druckman and Ebner 2008).

Facing the challenge of improving students' learning through simulation, teachers would do well to improve the effectiveness of their employment of this method. A variety of suggestions have been made for improving the contribution of simulations to learning: what must we do to make the exercises work? Examples are clarifying learning objectives (Bredemeier and Greenblat 1981), providing more conceptual background on the subject prior to the simulation activity (Druckman and Robinson 1998), creating time for reflection on the events and getting feedback (McLaughlin and Kirkpatrick 2005), and providing participants with conceptual maps and graphics that reflect the game's purpose (Duke 1974). Other suggestions regarding use of simulations have been made through the evolving perspective provided by *Negotiation 2.0* in this book (Kovach and Ebner, *Simulation 2.0*, in this volume), as well as in the previous volume (Alexander and LeBaron 2009).

Improving the way we structure and use simulation is, however, only a partial response to the research described above. It challenges teachers to revisit their intuitive notions regarding simulation. Given the body of research showing that most social-science simulations do not improve student learning – but are, on the other hand, useful tools for retaining the material and stimulating interest, it would seem clear that the use of simulation needs to be targeted more carefully than it currently is, and that other modes of learning be considered. While suggestions have been made for incorporating a wider spectrum of experiential methods, relieving simulation of its center-stage role (Alexander and LeBaron 2009), we want to focus on something a bit closer to home. Long-time enthusiasts and de-

signers of simulations ourselves, we will move on to suggest another mode of learning that does not take us too far away from the previous discussion: employing student *design* of simulations as a learning tool.

Benefits of Design

It would seem as if the learning benefits of design were by no means ignored by veteran simulation designers; however, few took the step of actually implementing this well-known secret in a classroom setting and most settled for mentioning it as a reflection or an anecdote regarding their own learning process. In the literature, some designers comment directly on why these activities are likely to enhance an understanding of the concepts being simulated. Others make the learning advantages apparent in their descriptions of the design process.

The theme of simulation design as a learning device is highlighted in these treatments. Daniel Druckman (1971) provides examples of how designers learn to conceptualize system processes. Cleo Cherryholmes, after conducting what may have been the first comprehensive study showing relatively few benefits to simulation participation over other forms of learning, suggested that students be given “the task of designing a simulation before playing it, either re-designing an existing game or constructing a simple game of their own” (1966:7). In discussing students’ experiences in playing Simulated Society (SIMSOC), William Gamson remarked that: “Playing a game may be a more active experience than listening to a lecture, but developing a game is more active still” (1972: 67). He went on to decry game playing as an experience that (for most students) contributes little to analyzing the events in a detached manner. In contrast, design contributes to analysis by identifying critical elements with clarity, encouraging a search for concreteness, synthesizing the elements (roles, goals, resources, and rules), and leading to new analytical questions (Greenblat 1975), as well as having designers take all these into account while considering relational and identity-based issues (Ebner and Efron 2005). Attention to the design process remains popular as evidenced by the game-building exercise featured at the 2007 International Simulation and Gaming Association (ISAGA) conference at Nijmegen in the Netherlands and in several sessions of the 2009 ISAGA conference in Singapore. It is also evident in the recent book by Chris Bateman and Richard Boon (2006).

If simulation design is such an effective learning tool, why do we not often encounter it in the classroom? We would suggest two reasons. First, the top-down approach mentioned above is evident in the simulation literature, which assumes a teacher/designer-

planned and -driven activity. Second, the comments extolling design are mainly opinionating and anecdotal. The efficacy of design as a teaching tool was not considered, measured, or reported. All of the evaluation data, such as those studies commented on above, explored the effectiveness of *participation* in simulations; none of them measured the learning effectiveness of *designing* them.

Elsewhere in this book, it is suggested that modest learning returns in simulation-based classrooms are one of the reasons for diminishing its role in negotiation education and developing a new range of experiential methods to serve as learning vehicles. If so, then it stands to reason that each of these new methods be subjected to the same type of systematic evaluation that has been done routinely with simulation techniques. If not, we are replacing a tried-and-tested method with known benefits and recognized downsides with what might turn out to be, at best, a set of well-intentioned but unevaluated ideas (Ebner and Kovach, *Simulation 2.0*, in this volume).

Taking this line of thinking seriously, we decided to experiment with the method of role-play design, testing its value as a teaching tool. We decided that design would be compared to the most widely researched teaching method in the field – learning through participation in simulation games as role-players. A literature review showed that despite the comments mentioned above, simulation-design as a teaching tool was not discussed much, and certainly little examination of its efficacy was conducted in the realm of negotiation pedagogy. Generally speaking, only a few attempts have been made to compare approaches for learning negotiation skills. Druckman and Victor Robinson (1998) assessed the learning that occurs in each of three roles: analyst, strategist, and designer. The authors did not compare designers with role-players. The more recent study by Raphaël Mathevet and colleagues (2007) assessed learning processes during the negotiating phases of a complex environmental simulation. They did not, however, compare learning in different simulated environments. Other studies have used simulations as platforms for evaluating a variety of less-active learning approaches to negotiation (e.g., Spector 1995; Nadler, Thompson, and Boven 2003). They did not examine the active learning features of simulating, or raise the notion of design as a learning activity.

In order to compare the benefits of the two methods, we set up the following experiment. Students heard a similar lecture regarding three negotiation concepts: alternatives, time pressure and power. They were then randomized into two groups. One was charged with designing a simulation that incorporated these three concepts into the storyline and instructions. The second group was then assigned

to role-play these simulations.³ At the end of each group's activity – design/role-play – they were asked to fill out a questionnaire regarding learning and motivation. A third group served as a control: they heard the lecture and, without partaking in any further activity, filled out the questionnaire. In addition, students in all groups were asked to fill out the same questionnaire one week later, during the next meeting of their class. The experiments were replicated with multiple groups, in Australia and Israel. For a full description of the experimental design and a discussion of the considerations behind it, see Druckman and Ebner (2008).⁴

The experiment resulted in four major findings regarding learning and motivational impacts of simulation role-players and scenario designers:⁵

- 1) The process involved in designing scenarios enhances short-term concept learning more than playing roles in those scenarios; role-playing did not improve perceived learning over the control group.
- 2) The relation among the various concepts learned is understood better by designers than by role-players or controls. Further, role-players did not understand the conceptual relationships better than the controls who only listened to the lecture.
- 3) Designers retain their understanding of the concepts better than role-players.
- 4) Designers demonstrate *higher* degrees of motivation than role-players.

To summarize, working “behind the scenes,” designers learn more about negotiation concepts than their “onstage” role-play counterparts, and enjoy the play more. These results were obtained both in Australia and Israel.⁶

These results challenge a long-held belief by negotiation teachers and trainers about the advantages of role-playing. The role-players in this study indicated less understanding of the concepts in both short and retention assessments and were less creative in their brief essays about relations among the concepts – but showed equivalent understanding in their essays on each of the separate concepts. They also showed less motivation in both short-term and retention assessments. Perhaps the motivation finding is most surprising. Designers were highly motivated by the task, more so than role-players. As we have already commented, enhanced motivation is the one consistent advantage simulation enjoys over other teaching methods; that designing trumps role-play participation on its home turf is very telling, in our opinion, regarding the pedagogical value of incorporating designing activities in negotiation courses.

The spread of results from this experiment provides empirical support for the intuitive observations made by the professional designers cited above. However, there is no clear, accepted, cause accounting for the advantage of design over role-play. Three possible mechanisms have been suggested. One is encouraging active involvement with the material. This is referred to also as concreteness (e.g., Greenblat 1975; Crookall 1995). Another is synthesis or seeing connections between ideas and processes (e.g., Druckman 1971; Duke 1974), including an appreciation for the long-term consequences of how the designed system is likely to evolve (Toth 1995). A third refers to generating analytical questions. All of these elements contribute to linking abstract thinking with concrete implementation in the form of a simulation. All are likely to result from a design experience to a higher degree than they are likely to manifest during a role-play. They may differ, however, on their relative contribution to learning (synthesis), retention (question generation), and motivation (concreteness). Other explanations may exist, or are waiting to be suggested.

Among the four findings, and of the explanations for design advantages discussed above, we were struck in particular by the finding that designers displayed a better grasp of the relation between concepts than role-players. Synthesis is particularly important in studying the field of negotiation. One well-accepted approach is that the negotiation process is not sequential but is rather a tension between various elements formed by the way these influence each other over time (see Ebner and Kamp, *Relationship 2.0*, in this volume). The interaction and relation between the various elements are what make each process unique, and pose the negotiator with his or her greatest opportunities for gain and perhaps jeopardy for loss.

To demonstrate the importance of understanding relations among concepts, let us consider a negotiation between management and union representatives during a strike. Positions taken by the parties at the bargaining table are influenced by an interplay among the following factors: state of the economy, current administration policy on unemployment, the wage-price spiral, community standard of living, going rates at other companies, company budget and costs for alternative agreements, union funds/strike costs, and the history of the strike including factors that generated the grievances. Defining these factors in a simulation scenario is one design challenge. Conceptualizing relationships among them is another. For example, going rates at other companies in the industry depend on the state of the economy as well as company profits and the community's standard of living. The going rates are also alternatives for employees who must balance opportunities against the costs of

striking and time pressure. The challenge of creating a scenario that ties these concepts together enables the designer to appreciate complexity, which includes also changing relationships among them through time.

Concept synthesis is a negotiation teaching goal, which designing seems to achieve at a unique level. Why does design enhance synthesis? David Crookall illuminates the key features of design: "(a) Design is concrete – you can touch the results; (b) it is creative – you develop an object, and (c) it is involving – you develop understanding in a passionate and intimate way" (1995: 161). These features are further developed in Duke's (1974) earlier chapter on the simulation design process. Taking the process through a sequence of stages, Duke provides clues to learning. Most important to the synthesis issue, perhaps, is the first stage, referred to as "generating the conceptual map." Questions asked include: What is to be conveyed (themes, issues, problems) by the simulation? How is the message to be transmitted to the role-players? These questions are answered by expressing the conceptual map with text and graphics, gauging the correspondence between the map and reality, ascertaining an appropriate level of abstraction, and implementing the map through simulation construction. This process encourages designers, first, to view the system from above and, second, to work out the details (including role definitions and assignments) for play – thereby capturing Crookall's features of creativity, involvement, and concreteness at a whole-system level, as the designer carries around a mental web of all the elements and concepts involved – and the connectedness and tensions between them.

Greenblat specifically recognized synthesis as a reward of designing: "... a gaming-simulation may be a more productive way of conceptualizing elements and relationships, whether one's purpose is teaching or refinement of theory" (1975: 93). This point is reinforced by the authors in Part II ("Elements of Design and Construction") of her 1975 book edited with Duke. In Greenblat's more recent book on game design, she claimed that design "primarily (satisfies) the need for systemic understanding – seeing the connections among roles, goals, resources, constraints, and contingencies." She adds: "Thus you may design your gaming simulation to instruct others, but you learn a great deal yourself!" (1998: 34).

Experiments on Conceptual Relationships

Based on this literature and on our findings, it is clear that simulation design promotes synthesis. It seemed to us that if we could crack the code of what it is, precisely, about design that enhances synthesis, we would be able to improve design exercises and instruc-

tions to students. Our aim was to take advantage of the synthesis-related benefits that this method has to offer.

The first step was to discover whether synthesis is affected by explicit priming, which was not done in the earlier experiments. The questions asked are: Does highlighting the designer activity of thinking about relationships among the concepts increase the amount of synthesis achieved in the exercise? Is there room for improvement beyond that achieved in the earlier experiments? These questions are one-sided: they suggest either improvement or no difference due to priming. A two-sided question could also be asked: Does priming actually decrease the amount of synthesis achieved? Conceivably, priming could backfire by focusing designers' attention on a particular activity rather than on a whole-picture view of negotiation. These alternative hypotheses were investigated, namely, that priming either improves or hinders synthetic thinking.

But other factors may be at play in the design process. One of these factors is the type of scenario that is designed. We observed that some designer teams created scenarios based on their own negotiating experiences while others created situations that were less experiential or more generic. This distinction is similar to that made between situated and non-situated learning. By situated we refer to the use of personal experience as a referent for scenario design. Non-situated means relying on knowledge about negotiation not rooted in personal experience. The former has been shown to enhance concrete (situation-specific) learning and is promoted in the context of on-the-job training programs. The latter is regarded as being beneficial for concept learning and is promoted in the context of academic education. (See Klatsky and Reader 1994, for a review of the debate and issues.) Implications for design are suggested by the difference between situated or non-situated scenarios and concept learning. That difference takes the form of a hypothesis: concept learning is enhanced by the process of designing non-situated scenarios. This hypothesis was evaluated by the experiment to be described next.

Both priming and "situatedness" were included in the experiment. A 2 x 2 design consisted of the four combinations of these variables: instructions with and without priming were crossed with situated vs. non-situated instructions. The priming condition asked designers to "consider the relationships between the three elements (alternatives, time pressure, and power)." The situated designers were asked to "choose a negotiation situation in which you were personally involved." These instructions were reinforced orally by the instructor. No other changes were made from the original design condition. The results, obtained from responses to the appended questionnaire, can be summarized.

Only a few statistically significant effects occurred for either of the two variables. Even the directional effects favored neither the primed or situated conditions: eight questions showed more learning for the primed condition, nine favored the non-primed condition; similarly, eight questions favored the situated condition while nine favored the non-situated condition. However, the differences that did occur were on the open-ended questions concerned with meaning and application of the concepts: five of the eight questions that favored priming were open ended; four of the eight that favored learning effects for "situatedness" were open ended. This is interesting because of the general lack of effects on these questions in the original experiment that compared designers with role players.

The overall lack of differences suggests the possibility of ceiling effects for the original designer condition. There may be limited room for further improvement on learning. However, they may also have been due to: 1) a weak manipulation of the variables; 2) a lack of theoretical justification for the variables; 3) implementation problems; or 4) unmotivated subjects (as suggested by answers to the questions on effort and satisfaction). These concerns led us to design and implement another experiment with the Israeli student population.

This experiment primarily addressed the issue of a weak manipulation for the priming variable. The key addition was the following instruction for the priming condition:

Consider how you might craft your scenario such that these relationships could emerge and influence the way the simulation develops during role play. Please make this a priority in your design. A good simulation, for the purposes of this simulation-writing exercise, will be one which helps role players to understand the interplay among the three ideas. Their actions should be affected by this interplay.

In contrast, designers in the non-primed condition were told to "incorporate each of the three concepts into the simulation." These instructions were reinforced orally by the lecturer. Both conditions were run with the generic, non-situated instructions for the type of scenario being constructed. The results differed considerably from those obtained in the previous priming experiment.

Seventeen of the nineteen immediate forced choice and open-ended assessments favored the priming condition; identical means were obtained for two of the open-ended questions. Nine of the nineteen differences were statistically significant, with effect sizes

ranging from .32 to .55.⁷ The priming condition means were also considerably higher (more self-reported learning) than those obtained for priming in the previous experiment. Further, for most questions asked in both the immediate and retention assessments, the mean obtained from the original (non-primed, non-situated) designer condition fell between those for the primed and non-primed conditions of this experiment. Thus, indeed, there was room for improvement; the original designer results did not hit a ceiling.

Eighteen of the nineteen one-week retention questions favored the priming condition. Thirteen of the nineteen differences were statistically significant, with effect sizes ranging from .39 to .71. Thus, the retention results were somewhat stronger than the immediate assessments, including those obtained for the open-ended questions about the meaning of alternatives and time pressure as well as how to deal with alternatives in a negotiation.

Another evaluation of condition effects was in terms of an index of percent increase in learning. The index consisted of a ratio of the average across the learning questions divided by the length of the scale, which was six steps for all the questions. The priming condition ratio for immediate learning was .83. The non-priming condition ratio was .65, a difference of .18.⁸ The original designer condition ratio (from the Druckman and Ebner 2008 experiment) fell between at .75. The priming condition ratio for retention learning was also .83 while the ratio for non-primed designers was .67, a difference of .16. Again, the original designers fell between with a ratio of .75.

Together, the findings obtained from these analyses suggest that a strong priming manipulation works. It produces a similar across-the-board sweep of findings as were obtained in the Druckman and Ebner (2008) comparison of designers with role players and controls. However, the strong designer priming exaggerates the differences further. Encouraging designers to focus attention on relationships among the concepts improves learning.

A question of interest is the extent to which explicitly priming conceptual relationships improves designer learning. Two assessments bear directly on this question. One is the question, asked also in the earlier experiments, about "the extent to which the exercise helps you to understand the relationships between the three concepts." Clear results were obtained with primed designers "out-learning" non-primed and original designers. Another question, added for the priming experiment, asked about "the extent to which you feel that placing special emphasis on relationships between the concepts contribute to learning about them." This question was also asked on a six-step scale with six indicating maximum relational

learning. Significant differences between the conditions occurred for both the immediate (Mean [primed] = 5.5; Mean [non-primed] = 4.4) and retention (Mean [primed] = 5; Mean [non-primed] = 4) assessments. Primed designers were aware of the connection between conceptual relationships and learning. The priming strengthened these perceived connections.

Our results reinforce the observations made by simulation theorists: synthesis is part of the design process. But, our findings go a step further. They suggest that the hypothesized learning benefits are increased when designers are told to prioritize this particular feature of scenario design. The practical implication of this finding is clear, namely, prime the relational feature in design assignments. The theoretical implications are more complex. Several questions are raised for further research:

- 1) Are the learning differences obtained in these experiments limited to concept learning? Would learning effects for role players be stronger on tactics than on concepts?
- 2) To what extent do the priming findings reflect expectations for learning (referred to also as demand characteristics) rather than actual learning?
- 3) Do the effects obtained with negotiation concepts also occur in other substantive domains?
- 4) Do role players learn more when they implement professional designs? Do they learn more when they play different roles and versions of the same scenario?

These are questions to be addressed in a next generation of experiments. Before concluding the chapter, we turn to a discussion of implications of the findings for teaching.

Applications

The findings reviewed in this chapter suggest that design activities enhance concept learning in general and relational learning in particular. This conclusion has implications for teaching applications. In this section we discuss four ways in which designer exercises can be implemented in the classroom. Each has been used by us and by colleagues familiar with the research findings. The teaching methods can be arranged in terms of increasing complexity or levels of analysis as follows:

- Teaching individual negotiation concepts
- Teaching sets of concepts
- Comparing different models
- Integrating the material from an entire course

Each approach is summarized briefly followed by suggestions for conducting the exercises.

Teaching Individual Negotiation Concepts

Using design to teach one element at a time can be done in a relatively short period of time. After explaining the negotiation concept, students are instructed to write a brief story about a negotiator who is considering that element. It is advisable to keep other creativity-requirements to a minimum at this stage, until they understand the basic structure of design; they can be told to write a story about a particular context or situation instead of making up situations on their own. For example, regarding the concept of alternatives, students can be asked to write a brief story about a person who is negotiating for a used car, in which the element of best alternative to a negotiated agreement (BATNA) comes into play. A few students should read their stories to the class, so as to make sure that the concept of BATNA is embedded in them (and, perhaps, to make a couple of design-focused comments along the way). They may also write the opposite role – in this case, a used car salesperson with a van on their lot – incorporating the concept of BATNA on this side as well.

A good form of design-related feedback for teaching single element designs is to ask students to alter existing scenarios. For example, after teaching the concept of alternatives, students are asked to retrieve their copy of a simulation conducted the previous week. Then, add two sentences, referring to alternatives, that would have changed the negotiation dynamics significantly.

The party-by-party design exercise can be completed in half an hour, whereas the scenario-alteration exercises can be completed in less than ten minutes. This is a good investment of time, particularly if more extensive design is planned as an activity later in the course.

Teaching Sets of Concepts

We have shown that simulation design is a powerful method for learning about relationships between concepts, particularly when students are primed to take these relationships into account. In our experiments, students were encouraged to incorporate three concepts in their scenarios – alternatives, time pressure, and power. However, any set of concepts may be used: for example, culture, emotions, and integrative agreements; a variety of concepts can be drawn from the research as summarized by Druckman and Robinson's (1998) sixteen thematic narratives.

The instructions that were used for the experiment can be adapted for use in conjunction with any designer exercise. Few changes would be needed for any set of negotiation concepts. The key instruction is to

consider how you might craft your scenario such that relationships between the concepts could emerge and influence the way that the simulation develops during a role play. This is a priority in your design. A good simulation, for the purpose of this exercise, will be one that helps role players understand the interplay among the three ideas. Their actions should be influenced by this interplay.

Instructors would be available to field questions from designers about relational challenges that arise during the writing period.

Comparing Alternative Theories

The simulation design method can be applied on a larger scale. For example, it can be used to allow students to develop a full “elements” model of negotiation. Such an exercise is preceded by considerable learning of the model, and usually involves students developing more extensive role information. Students prepare a full scale simulation keeping all of the model’s elements in mind, and giving thought to how they can be incorporated into the simulation.

Another large-scale application of this method would involve using simulation-design as a vehicle for comparison *between* theoretical models. Students might be assigned to choose two models from a menu of theories studied during a course, and tasked with designing a simulation in which elements related to them are embedded such that they are likely to be called into play in the negotiation situation. After a break, the designers then attempt to incorporate the other theory in their scenario. The class debrief focuses on comparing the strengths and weaknesses of the two models in relation to the case. An example is to contrast positional bargaining with interest-based bargaining (Fisher, Ury, and Patton 1981). Another example is the difference between alternative game-theoretic models referred to as transaction costs and discounting (Cramton 1991). These models posit different choices leading to equilibrium solutions to the bargaining problem. Other contrasting negotiation approaches, drawn from class readings and discussion, could be highlighted in the exercise as well.⁹

Integrating the Material of an Entire Course

Another way of using simulation design for learning, which benefits greatly from the power of design to clarify relationships between discrete elements, is assigning simulation design as a course’s final project. At this point, students are at the peak of their negotiation knowledge and are also experienced with negotiation simulations –

how they are constructed and how they play out. If small design exercises have been assigned along the way, students have this to build on as well. We have found that students approach this assignment enthusiastically and creatively, as evidenced by the quantity of material produced, the creative production of support material, the intricacy of the story lines, and by their direct feedback.

Designers are asked to develop a complex simulation that incorporates ideas learned in class. Sample instructions include the following: "...build a scenario comprised of familiar elements...be sure to include stages of conflict escalation or of relationship change, leaving room for further development by the role players...the basic elements of negotiation learned in class should surface in the scenario." Further, "such processes as coalition forming, intra-team dissension, trading on multiple issues (logrolling), and communication barriers should emerge...these processes were demonstrated in the class video and discussed by the authors of your assigned readings."

Choices to be Made

The following choices often confront designers of simulations in any of the four approaches discussed above. Guidance is provided by our answers.

Should Designers Work by Themselves or in Pairs?

We have conducted these exercises both ways, and have observed that task motivation and creativity (but not concept learning) are enhanced when designers work in pairs. However, team-work adds a dimension of coordination which increases the time needed to complete the exercise. Of course both formats can be tried and, perhaps, leaving the decision up to the students is reasonable.

Should the Exercise be Conducted in Class, or Outside of Class-hours?

The smaller-scoped versions, as we have mentioned, are quite suitable for in-class work. The experimental task discussed above was completed in an hour, not including time for a de-briefing. One does, however, need to keep in mind that writing is a creative task, which needs a suitable amount of time and a certain frame of mind. As a result, the wider the scope of the assignment, the more it will be suitable to let students design simulations on their own time, perhaps as a take-home assignment. We have used this assignment in a distance-learning course, where students complete work at their own pace. We have also conducted online exercises, in asynchronous formats, that allow students to complete their work over several

days. These longer assignments are suitable as well for longer course-end projects.

What Should Designers Write About?

One question that often arises is whether students should base their scenarios on situations they have experienced or invent fictional scenarios based primarily on their knowledge of negotiation. As we noted earlier, our research thus far has not shown differences in learning outcomes between the two types of scenarios. As a result it would probably be best to tell students to choose whichever they prefer and hope that this freedom will have a positive effect on motivation.

What Types of Groups Should Conduct These Exercises?

It is important to stress that, in our experience, not all students enjoy the design exercise. Some felt that they were being pressured to produce original material in a short period of time. It will be helpful to explore a variety of procedures for conducting design writing, including allotting more time and perhaps other types of support. More compelling, perhaps, is that the exercise may be problematic in some cultures or contexts. Like any classroom innovation, the receptiveness of students or trainees is important to take into account. More generally, teacher mindfulness and specific preparation for each group are advised.

Conclusion

The learning advantages shown for designers suggest that class role plays should be supplemented with design exercises. Several of us have been doing this for a long time and have developed alternative approaches for implementing the exercise, as discussed in the previous section. We now have empirical evidence to support this pedagogical decision. Further, we have discovered that relational thinking may be the key: stronger effects for the design experience occurred when conceptual relationships were primed and this occurred on both the forced-choice and open-ended questions. It occurred also for both situated and generic scenarios. Yet, the weaker effects obtained on many of the open-ended application questions serve to reduce our enthusiasm to an extent. The difference between perceived and demonstrated learning remains an issue for further research. (For more on this issue, see Druckman and Ebner 2008.) So too does the need for comparisons with other teaching techniques and among a variety of student and professional populations. But, research also needs to address the implication drawn from our findings – that role plays are less useful than previously thought.

Although it may be that role-playing is not the preferred approach for enhancing concept learning, it is likely to contribute in important ways to negotiation practice. Role-playing may well be the method of choice for gaining experience and feedback from employing a variety of tactics. It may also contribute to the design experience by providing designers with insights into the way a simulation is structured and managed. (See also Winham 2002, for other practical advantages of role-plays.) These contributions bolster the case for complementary – and sequential – uses of role-play and design. For example, simulation design may enhance the understanding of such concepts as alternatives while role-playing in simulations may be a better method for learning when and how a negotiator might disclose his or her alternatives to a negotiating opponent.

Notes

¹ In this paper, we use the term “simulation” as a generic reference to experiential-learning activities commonly labeled “simulations,” “games,” “simulation-games,” and “role-play.” We use the term “role-players” to denote participants in a simulation activity who play out roles based on information and instructions they are given, such as in the experimental condition described in this chapter. These decisions are not intended to influence the debate on the way these activities are conducted or the delineation between them. For a detailed discussion of this issue, see Crookall, Oxford, and Saunders (1987).

² This interplay of elements, familiar to any negotiation trainee, is the hallmark of Inbar and Stoll’s (1972) guide to simulation design, one of the first texts on this subject. Using a conflict simulation as their example, these authors provide a step-by-step guide to designing a simulation. They emphasize goal setting, structuring of constraints, and allocating resources. Each is an essential feature of negotiation. By goals, they refer to structuring the game outcomes to allow for one or many winners. Four constraints include legitimacy, interdependence or common fate, patterns of communication, and coalition formation. By allocating resources, they refer to designing an exchange process for transferring resources.

³ A question can be raised about whether amateur designs provide a quality learning experience for role-players. It may well be that simulations designed by professionals would provide a better learning experience. However, it is also the case that the designers were also amateurs whose learning experience would have been enhanced by prior design opportunities. Symmetrical experience provide an apples-to-apples experimental comparison. It would have been more problematic to match amateur designers with role-players who implement professional designs or to compare experienced designers with amateur role-players. Further research is needed to evaluate relative learning benefits from amateur vs. professional designs.

⁴ The questionnaire addressed learning in two aspects: Perceived learning (or, how students evaluate their understanding of a concept) and demonstrated learning (students' explanation of a concept being assessed by an expert reader). In our 2008 article we discuss the reasoning behind adopting this dual form of measurement and also discuss some interesting discrepancies between the two sets of data. Motivation was only measured by subjective means, but we probed this issue from various directions (e.g., satisfaction with outcome, desire to engage in such a task again, etc.).

⁵ These findings are reported here in brief. For a more precise discussion about the statistical significance of each finding, see the original article.

⁶ The focus of these experiments is on indicators of learning/motivational benefits derived from the activities of design and role-play. We do not assess competence in scenario writing or in role-playing. Further, participants are told that "we will not use your scenarios (or role-plays) to evaluate your negotiating or literary skills."

⁷ The effect size (ES) expresses the amount of variation accounted for in the dependent variable (learning) by the independent variable (priming vs. non-priming). In these analyses, the ES is a conversion of a t test significance level to a correlation coefficient (see Wolf, 1986 for the conversion formulae).

⁸ A ratio of .83 means that priming-condition designers reported achieving more than four-fifths of the distance on the six point scale (where six is maximum learning), with an average mean of 5. A difference of .18 between the condition ratios indicates that primed designers reported 18% more learning than non-primed designers (a mean of 3.9 on the six-step scale).

⁹ Thanks go to Atalia Mosek of Tel Hai College, Israel, who developed this application of teaching by simulation-design after hearing about our experimental work. For detailed instructions used with each of the approaches discussed in this section, contact the authors at dandruckman@yahoo.com or noamebner@creighton.edu.

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Appendix

Learning About Your Experience

We are interested to learn about your experience. Please provide feedback by answering the following questions. Note that some ask you to provide an "X" on a scale, while others ask you to provide more detailed information. Thank you very much for your participation.

Regarding the Concept of "Alternatives":

1. How much did the exercise contribute to your understanding of this concept? (Check one box)
 - Very much
 - Pretty much
 - Somewhat
 - A little
 - Not much
 - Not at all
2. To what extent did the exercise provide added value to your understanding of the concept presented in the lecture? (Check one box)
 - Added considerably
 - Added pretty much
 - Added somewhat

- Added only a little
- Did not add much
- Did not add anything at all

3. What is meant by “alternatives”

4. How would you use or deal with this concept in the course of a negotiation?

Regarding the Concept of “Time Pressure”:

5. How much did the exercise contribute to your understanding of this concept? (Check one box)

- Very much
- Pretty much
- Somewhat
- A little
- Not much
- Not at all

6. To what extent did the exercise provide added value to your understanding of the concept presented in the lecture? (Check one box)

- Added considerably
- Added pretty much
- Added somewhat
- Added only a little
- Did not add much
- Did not add anything at all

7. What is meant by “time pressure”?

8. How would you use or deal with this concept in the course of a negotiation?

Regarding the Concept of “Negotiating Power”:

9. How much did the exercise contribute to your understanding of this concept? (Check one box)

- Very much
- Pretty much

- Somewhat
- A little
- Not much
- Not at all

10. To what extent did the exercise provide added value to your understanding of the concept presented in the lecture? (Check one box)

- Added considerably
- Added pretty much
- Added somewhat
- Added only a little
- Did not add much
- Did not add anything at all

11. What is meant by “negotiating power”?

12. How would you use or deal with this concept in the course of a negotiation?

13. To what extent did the exercise help you to understand the relationships between the three concepts? (Check one box)

- Very helpful
- Pretty helpful
- Somewhat helpful
- A little helpful
- Did not help much
- Did not help at all

14. How do you think these concepts are related in negotiation?

General Observations

15. More generally, we would like to know how much you enjoyed the exercise: (Check one box)

- Very much
- Pretty much
- Somewhat
- A little
- Not much
- Not at all

16. How much effort did you put into the tasks? (Check one box)

- A lot
- Pretty much
- Somewhat
- A little
- Hardly any

17. Would you do it again? (Check one box)

- Yes
- No
- Maybe

18. How satisfied were you with the results? (Check one box)

- Very much
- Pretty much
- Somewhat

19. What did you enjoy most about the exercise?

20. What did you enjoy least?

21. Do you think that you would have learned more, less, or the same by performing the other role (either scenario writer or role-player)? (Check one box)

- Would have learned more
- About the same
- Would have learned less

Thanks again for your time!

