GENDER DIFFERENCES IN ENTREPRENEURIAL LEADERSHIP SKILLS TRAINING

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ABSTRACT

Effective entrepreneurship requires proficiency in leadership skills. This research empirically tests the relationship between perceived gender gaps and pedagogy with respect to the development of perceived leadership effectiveness in women and communication effectiveness in men. We use innovative technology to develop training experiences that facilitate experiential learning in a controlled environment and then empirically evaluate the transferability and, use, of these skills for the study's participants. The results of this study suggest that the use of computer game-based simulations to teach the experience and practice of leadership may be particularly effective in improving communication skills in men and improving leadership effectiveness skills among women. Implications for entrepreneurship training are delineated.

INTRODUCTION

Entrepreneurship research has noted gender differences, especially in terms of the number of entrepreneurs, with women typically outnumbered by men two to one. The trend is changing, but slowly (Acs, Arenius, Hay, & Minniti, 2004). Entrepreneurs are by nature 'leaders' as they lead the effort to launch new ventures, create the vision, select a team that will carry out the vision, and managing the team (Chen, 2007). Most universities are offering courses, minors, and majors in entrepreneurship. However, little attention has been given that links entrepreneurship education with leadership (Roomi & Harrison, 2011). We seek to address this under-researched area by examining methods to develop leadership communication and leadership effectiveness competencies.

There is a voluminous amount of research on gender as it relates to the characteristics of leaders, the situations leaders face, and the relationship between leadership and followers (Bass & Stodgill, 1990). However, there are still significant questions regarding the development of leadership skills among women as opposed to men. Stereotypes and perceptions contribute to the notion that women, as a rule, are less effective as leaders than are their male counterparts. Similarly, research has also concluded that the depth and breadth of male communication acumen is weaker than that of the communication competencies of females. These gender stereotypes are common in entrepreneurship, with entrepreneurs having a more masculine stereotype (Gupta, Turban, Wasti & Sikar, 2009). Thus, there is a perceived gender gap for women with respect to leadership effectiveness skills and for men with respect to effective leadership communication skills.

In this research, we grapple with the challenge of developing leadership effectiveness and leadership communication competencies within undergraduate women and men. Often the classroom is a coeducational experience and the pedagogy applied is not gender-centric. Although

a number of studies suggest that men and women differ with respect to communication skills and leadership styles, little research has been conducted to investigate whether these skills develop in men and women the same way. Also, as a matter of pedagogy, when a particular classroom experience is provided, little research has been conducted to determine whether both genders learn similarly.

This paper examines the impact of pedagogy on learning as it relates to gender. We generate hypotheses about the impact of a traditional versus a technologically-driven approach to student learning. The tested pedagogies are designed to develop both leadership effectiveness and leadership communication competencies that are relevant for aspiring entrepreneurs. Our primary research question is: Does pedagogy impact students of different genders differently? First, we build and present our hypotheses based on learning theory. Then we report the results of an empirical test of two pedagogical approaches.

PEDAGOGY AND GENDER

Do men and women learn differently and/or have different preferred ways of learning? Despite the passion, emotional debate, and political correctness engendered by this question, the answer may alter dramatically the ways in which subject matter is taught.

Most learning theories recognize that faculty must have knowledge of the learner and his/her characteristics to be effective (Slater, Lujan and DiCarlo, 2007). Slater et al. (2007) report that gender is among a number of factors (along with age, academic achievement, brain processing, culture and creative thinking) that influence student learning style. Many pedagogical techniques, however, are applied unilaterally in the classroom assuming uniform effectiveness without regard to gender diversity.

Attention to the impact of pedagogy across genders may help clarify whether men and women have different learning experiences and/or learning styles. "Learning style" is defined as an individual's characteristic way of processing information, feeling, and behaving in a learning situation (Philbin, Meier, Huffman, and Boverie, 1995). In addition, how to bridge gender skills gaps in light of different learning experiences and/or learning styles is an important consideration for instructors.

This paper examines the relationship between gender and learning experience with respect to the reported skill gaps in leadership effectiveness (for women) and leadership communication (for men), then compares the learning outcomes for the two gender groups.

EXPERIENTIAL LEARNING THEORY AND LEADERSHIP PEDAGOGY

At the undergraduate level, a primary form of competency development within the curriculum is information-based; what Habermas (1970) referred to as technical learning. Pedagogically, technical learning is achieved through identifying the specific set of concepts and behaviors needed to achieve a level of competence. However, Nirenberg (2003) criticizes the technical and mechanistic pedagogies used in business schools. He likens instruction that emphasizes the memorization of Fiedler's (1967) contingency situations and Vroom and Yetton's (1973) decision-making methodology to driver education classes that do not place the student behind the wheel of a car (Nirenberg 2003). He argues that students will know much descriptively about complicated models but nothing about how to use them. To counter the limitations of mechanistic pedagogies, Kolb and Kolb (2005) suggest implementing experiential learning processes in higher education. This argument is echoed by others who suggest that entrepreneurs

are action oriented and learn by doing (Kolb & Kolb, 2005; Lester, Tomkovick, Wells & Flunker, 2005; Middleton, 2005; Minniti and Bygrave, 2001; Rae and Carswell, 2000; Cope and Watts, 2000; Smilor, 1997), thus rendering experiential learning particularly relevant for entrepreneurship education.

Experiential learning is a "process in which internalized reflection follows concrete experience, resulting in an adaptation revealed in further experience" (Quay, 2004, p. 108). Or stated another way, experiential learning is a continuous process in which learning is created through the transformation of experience (Kolb, 1984). The experiential learning process consists of four stages: Concrete experience, observation and reflection, forming abstract concepts, and testing in new situations (Kolb, 1984). In the concrete experience stage, the learner actively engages in an experience, which is followed by observation and reflection on the experience. After this reflective stage, the learner forms abstract conceptualizations about what has occurred. Finally, the abstract conceptualizations formed provide guidance for future experiences.

The experiential learning process is often replicated in simulations. These simulations have become powerful tools in business, psychology, and sociology (Anderson, Rauthbaum, & Hodges, 2001; Gordon & Yukl, 2004; Sawyer, 2003). Traditional pedagogies, even experientially-based, rarely allow students to examine the impact of their actions and decisions on others. Computer-based simulations, however, can create this effect and thus may be a useful alternative to traditional methods for entrepreneurship education and management education in general.

Clark Aldrich (2004) describes the development of such a simulation for the business context in his new book: Simulations and the Future of Learning: An Innovative (and Perhaps Revolutionary) Approach to e-Learning. The book offers insights on leadership and how to develop leadership skills based on his experience building a leading-edge leadership training tool, SimuLearn's *Virtual Leader*™.

Virtual Leader™ represents leading-edge integration of technology and business. The purpose of the simulation is to provide an opportunity for the student to play the role of leader in the context of a meeting. The goal of the simulation is to identify and promote ideas that will accomplish the "right" work and to prevent the "wrong" work from being done. The level of sophistication of this simulation allows the student-as-leader to engage in conversations around various ideas that emerge during meetings. The goal of the simulation is for the student to experience interactions with others in such a way as to practice conversations (ways of speaking, reacting, and deciding) that are productive in promoting her/his goals for the meeting. From an experiential learning perspective, the student is able to determine the impact of the application of their theories in use and make revisions in the next game or at the next level in the game.

FOCAL HYPOTHESES OF THIS STUDY

We tested the impact of two pedagogical approaches on the development of practical leadership skills among undergraduate students, both male and female, at a public, historically-black university in the southeastern United States. One pedagogical approach is based on a blend of technical and traditional pedagogical tools such as lecture, self-assessment, case analysis, and facilitated discussion. This approach was enhanced through the use of online rather than paper-based cases. In this paper, we refer to the group of students that engaged in this pedagogical approach as the "traditional group." The second approach used only the game-based experiential simulation, the *Virtual Leader* ^{TM}, described above, supplemented by facilitated discussion of the experience. We refer to the group of students engaged in the *Virtual Leader* ^{TM} as the "experiential group."

Since the conceptual content of both training programs is the same, we might expect that the two student groups would exhibit similar schema change, or in other words, might exhibit similar learning. Kolb's (1984) work, however, would suggest that the opportunity to practice application of leadership skills (concrete experience) using the software would lead to reflective observation and abstract conceptualization by the learner. This process might result in a different perception of what leadership is and how leaders act. This leads to the following hypotheses.

H1a: There will be a greater degree of change in leadership schema for women participants of the experiential group compared to women in the traditional group.

H1b: There will be a greater degree of change in leadership schema for men participants of the experiential group compared to men in the traditional group

The experiential simulation models certain leadership behaviors by allowing the leader to engage in conflict management strategies, create tension, and directly utilize power and influence to accomplish work, practices crucial for an entrepreneur and in which women historically have been assumed to be less effective than men. Female participants in the simulation would be encouraged to be more assertive, accept their responsibilities for managing conflict productively, and challenging non-productive behaviors. The simulation would model and affirm those leadership behaviors that are considered more assertive such as conflict management.

For men, the simulation models the use of effective interpersonal skills through coaching, nurturing, and inviting "deep" conversation in order for leaders to motivate and engage subordinates/employees. In fact, by embedding interpersonal behaviors in a leadership simulation, and highlighting the importance of team-building and social interaction in getting work done, the leadership behaviors for male participants are projected to be significantly altered. Due to the simulation pedagogy, we would expect that male participants in the simulation would be perceived as exhibiting more effective interpersonal skills than their counterparts in the traditional group. Thus, we hypothesize different patterns of learning for men and women across pedagogy as follows:

H2a: Women trained in the experiential condition will be perceived as more effective leaders than women trained in the traditional condition.

H2b: Men trained in the experiential condition will exhibit a greater degree of interpersonal interaction than men trained in the traditional condition.

RESEARCH METHOD

This research used a quasi-experimental design with random assignment to test our hypotheses. The research proceeded in two phases. In the first phase, the control group (traditional pedagogy) and the experimental group (experiential pedagogy) were trained using the assigned pedagogy. Data were collected before and after the intervention to determine their perceptions of ideal leader behavior. In the second phase, approximately 10 weeks after the completion of the training intervention, participants engaged in a complex role play simulation where they were encouraged to apply what they had learned from the training. Data on leader effectiveness and data on interpersonal interaction were collected and analyzed.

Although the training interventions, data collection, and subsequent role play simulation were done with mixed samples of men and women, for the purposes of this research, we treat this

data as though the two gender groups are separate. Thus, we compare data for women undergoing the traditional pedagogy with women undergoing the experiential pedagogy. Likewise, we compare data for men undergoing the traditional pedagogy with men undergoing the experiential pedagogy. This separation of the data by gender is consistent with our goal to assess the impact of different pedagogy on male and females. It is not our intent, in this research, to compare scores of males and female. Rather our goal is to examine patterns of learning that may be experienced by the women students and the men students and draw inferences on the relative impact of these pedagogies on each gender group.

Sample

To test these hypotheses, 38 undergraduate honors students (23 women and 15 men) at a Mid-Atlantic university in the U.S. were enrolled in a two-day leadership training program. Students who agreed to participate were randomly assigned to either the traditional or experiential condition.

Experimental Manipulation

Both groups received the same lecture introducing the concepts. Both groups were engaged in 12 hours of training over the course of two contiguous Saturdays. In the experiential group, the initial introductory lecture/discussion was followed by an online tutorial to train how to play *Virtual Leader*. After the online training, students were asked to play practice rounds and engaged in a facilitated discussion regarding their experience in the game.

In the traditional pedagogy condition, the material was presented in four components; the introductory component and three areas of content. Each area of content was supplemented by an in-class exercise, an online case study, and a facilitated discussion of the online case. The underlying algorithm of the *Virtual Leader* that was adapted for the traditional pedagogy condition consisted of material covering topics relevant to entrepreneurship including: emotional intelligence and leadership, managing creativity and conflict, and using power and influence.

Phase 2 – Impact of the Training

To test the impact of the training, approximately 10 weeks after the initial training program interventions the participants were taken to the Center for Creative Leadership (CCL) in Greensboro, NC to participate in the Looking Glass, Inc. simulation. We used Looking Glass, Inc. (McCall & Lombardo, 1982) because prior research has clearly suggested that this simulation provides a very realistic and challenging venue to examine an individual's leadership skills (Chatman and Barsade, 1995). The Center for Creative Leadership is internationally recognized by both academics and practitioners for its leadership training using the Looking Glass, Inc. simulation. Looking Glass Inc. is a fictitious glass manufacturing company with three divisions[1].

Data Collection

[1] This is not a computer simulation; it requires the participants to communicate extensively with each other through different mechanisms and to discuss many issues. It reflects the realities of complex leader decision making and takes a lot of time for the participants to understand the issues, prioritize them, identify various potential solutions, and make decisions on the variety of issues.

Each student was required to complete one assessment instrument prior to phase 1 of the training and three assessment instruments after phase 1 of the training. One instrument, the Ideal Leader Behavior Description Questionnaire XII (Stodgill, 1974), was completed both prior to phase 1 of the training and again at the conclusion of phase 1. This instrument was used because it captures information about the participant's perceptions as to how leaders behave. In addition, a learning assessment was completed at the end of phase 1 of the training to determine the students' perceptions of their learning. Finally, a program evaluation instrument was completed by all students to determine that both groups' experiences were equally satisfactory. At the end of the Looking Glass, Inc. simulation data was collected using two instruments used by CCL. One instrument resulted in a socio-gram for each participant showing the network of relationships and interactions during the simulation. The second instrument asked each student to rate the effectiveness of each other.

Participants were assigned to either a "traditional" pedagogy training intervention or to an "experiential" training intervention using the *Virtual Leader* software. The change in the leadership schema of the participants was measured using the LBDQ XII (Stodgill, 1963). Students were asked to complete this survey prior to the training to determine their a priori leadership schema. Students were asked to complete the same questionnaire at the conclusion of training.

Students responded to specific questions regarding their perceived learning about the specific concepts covered in phase 1 of the training. Both groups were asked the same questions. For each of 16 items, students were asked about the adequacy of coverage of that idea using a 3 point scale ranging from excellent coverage (3) to inadequate coverage (1). Also for each of the 16 items, students rated their level of learning on a 5 point scale ranging from 5 representing "substantial increase in understanding" to 1 representing "no increase in understanding at all". This allows us to determine if there are differences in perceived learning based on the two pedagogical interventions. In this research, we examine the impact of pedagogy on the men's perceptions of their learning and the impact of pedagogy on the women's perceptions of their learning. The program evaluation instrument measured the students' satisfaction with their experience in the training program. Fourteen items were included in the program evaluation. Responses were based on a 5-point scale with 5 representing "excellent" and 1 representing "inadequate".

Leader effectiveness was measured using a 360 assessment tool designed for use in the Looking Glass, Inc. simulation. Each student who participated in the Looking Glass, Inc. simulation at CCL was asked to evaluate the other members of the simulation within their division. Each individual had an average score, ranging from 1-5 from 3 sources, a subordinate, a supervisor, and a peer. These averages were summed to create a leader effectiveness score ranging from 3-15. Low numbers indicated ineffectiveness.

Interpersonal effectiveness was evaluated by examining the self-reported interactions among all members of the Looking Glass, Inc. simulation. Each participant was asked to indicate the people in the division with whom they had an important relationship through drawing a socio-gram and answering questions about the relationship. This data was recorded; and the number of relationships within the division, outside the division, and vertically or horizontally were calculated for each participant. To adjust for differences in size of divisions, the numeric calculation was the number of relationships reported over the number of possible relationships at that level within the division. This measurement was intended to determine if there were any

differences in behavior exhibited across the two training groups. High numbers indicate that there were more interactions among the participants.

ANALYSIS AND RESULTS

As a manipulation check, we examined the program evaluation completed by the participants at the end of phase 1 of the training (Table 1). There were no statistically significant differences in student satisfaction across the two groups.

An additional manipulation check was done regarding perception of coverage of topics (Table 2). The male participants' evaluations of coverage were not statistically significantly different across the two conditions. The women participants' responses showed that coverage of the importance of objectives and the role of creative thinking was perceived more strongly by women in the traditional condition.

Table 1
MANIPULATION CHECK
Program Evaluation Results

	Mean	
	n=17	n=20
Program Evaluation	**Traditional**	**Experimental**
Topics covered	4.53	4.65
Visual aids in the classroom	4.53	4.55
Length of the program.	4.53	4.55
Physical facilities	3.41	3.60
Quality of instruction	4.53	4.60
Quality of food and beverages	4.65	4.60
Interaction among participants	3.88	4.10
Materials and handouts	4.06	4.30
Professionalism of the faculty and staff	4.94	4.90
The use of technology in this course	4.88	4.80

Table 2
MANIPULATION CHECK AND SELF-REPORTED ASSESSMENT OF TOPIC COVERAGE
Gender by Pedagogical Condition

		MEN				WOMEN			
		Coverage Mean							
		N	Mean	Std. Deviati	Stat. Sig.	N	Mean	Std. Deviation	Stat. Sig.
1. Making tradeoffs between the uses of Power, Tension, Ideas, and Work.	Traditional	7	2.86	0.38	n.s.	10	2.800	0.422	n.s.
	Experiential	6	2.83	0.41		15	2.800	0.414	
2. Understanding and using tactics to uncover ideas.	Traditional	7	2.57	0.54	n.s.	10	2.700	0.483	n.s.
	Experiential	6	2.50	0.55		15	2.800	0.414	
3. Understanding and using tactics for handling tension or conflict.	Traditional	7	2.86	0.38	n.s.	10	2.800	0.422	n.s.
	Experiential	6	2.50	0.55		15	2.733	0.458	
4. Understanding the need for listening and sharing power with others.	Traditional	7	2.86	0.38	n.s.	10	2.700	0.483	n.s.
	Experiential	6	2.83	0.41		15	2.867	0.352	
5. Importance of matching your specific tasks (work) to organizational goals and priorities.	Traditional	7	2.71	0.49	n.s.	10	2.700	0.483	n.s.
	Experiential	6	2.50	0.55		15	2.667	0.617	
6. Understanding and using tactics for gaining power and influence.	Traditional	7	3.00	0.00	n.s.	10	2.800	0.422	n.s.
	Experiential	6	3.00	0.00		15	2.867	0.352	
7. Considering the objectives of others in order to complete your goals.	Traditional	7	2.86	0.38	n.s.	10	3.000	0.000	p<.08
	Experiential	6	2.83	0.41		15	2.733	0.458	
8. Understanding the role of creative thinking.	Traditional	7	2.71	0.49	n.s.	10	2.800	0.422	p<.08
	Experiential	6	2.50	0.55		15	2.333	0.724	
9. Understanding that basic leadership behaviors are supporting or opposing ideas, and supporting or opposing others.	Traditional	7	3.00	0.00	n.s.	10	2.800	0.422	n.s.
	Experiential	6	2.83	0.41		15	2.933	0.258	
10. Understanding that the goal of a leadership situation is getting the right work done.	Traditional	5	3.00	0.00	n.s.	10	3.000	0.000	n.s.
	Experiential	5	3.00	0.00		14	2.929	0.267	
11. Understanding that there are ideas out in the open and there are hidden ideas.	Traditional	5	2.80	0.45	n.s.	10	2.400	0.516	n.s.
	Experiential	5	2.80	0.45		14	2.929	0.267	
12. Understanding the application of the "directing" leadership style.	Traditional	5	2.60	0.55	n.s.	10	2.900	0.316	n.s.
	Experiential	5	3.00	0.00		14	2.929	0.267	
13. Understanding the application of "participating" leadership style.	Traditional	5	2.80	0.45	n.s.	10	2.800	0.422	n.s.
	Experiential	5	3.00	0.00		14	2.929	0.267	
14. Understanding the application of "delegating" leadership style.	Traditional	5	2.80	0.45	n.s.	10	2.900	0.316	n.s.
	Experiential	5	3.00	0.00		14	2.714	0.469	
15. Understanding the differences between "directing, participating, and delegating" leadership styles.	Traditional	5	2.60	0.55	n.s.	10	2.800	0.422	n.s.
	Experiential	5	3.00	0.00		14	2.786	0.426	
16. Understanding the role of critical reasoning.	Traditional	5	2.60	0.55	n.s.	10	2.300	0.483	n.s.
	Experiential	5	2.40	0.89		14	2.643	0.497	

Do Men and Women Show Evidence of Difference in Learning?

For the men, the two pedagogies had similar results. There were no statistically significant differences based on the training intervention, thus rejecting H1b. For the female participants, there were two areas where learning was perceived differently based on the intervention. The female participants in the experiential condition indicated that they learned significantly more ($p<.01$) about the importance of ideas in leading organizations and the role of leaders in searching out ideas of others, even when they are not voluntarily offered (Table 3). Thus, for the women, there was agreement that these topics were covered equally in both interventions, but the women in the experiential conditions reported significantly higher levels of learning awareness around a particular topic thus supporting H1a.

Were There Differences in Perception of Leadership?

To examine changes in perception of leadership across the two training interventions, we examined differences between responses on pre- and post- LBDQ-XII questionnaires. First, we used an ANOVA to determine if there were statistically significant differences within the male and the female groups and across the two conditions prior to the training. Essentially, we wanted to see if the participants started from similar positions. For the women in this research, there were no statistically significant differences in a priori perceptions of ideal leader behavior across the two pedagogical conditions (Table 4). For the men, their perceptions of the ideal leader behavior were not statistically different prior to training with the exception of items associated with the importance of consideration. Men who were assigned to the experiential condition were more likely to think that these behaviors were part of their ideal leader schema ($p<.01$). Over all, the groups of men and women assigned to the two conditions were remarkably similar in their perceptions of the ideal leader prior to the training (Table 5).

Table 3
SELF-REPORTED LEARNING ASSESSMENT
Gender by Pedagogical Condition

		N	Learning Mean	Std. Deviation	Stat. Sig.	Mean	Std. Deviation	Stat. Sig.
1. Making tradeoffs between the uses of Power, Tension, Ideas, and Work.	Traditional	7	4.43	0.79	n.s.	4.10	0.876	n.s.
	Experiential	6	4.00	0.63		4.20	0.561	
2. Understanding and using tactics to uncover ideas.	Traditional	7	4.29	0.76	n.s.	3.60	0.843	p<.01
	Experiential	6	3.67	0.82		4.47	0.743	
3. Understanding and using tactics for handling tension or conflict.	Traditional	7	4.43	0.98	n.s.	4.20	1.033	n.s.
	Experiential	6	4.17	0.98		4.20	0.775	
4. Understanding the need for listening and sharing power with others.	Traditional	7	4.29	0.76	n.s.	3.90	0.994	n.s.
	Experiential	6	3.67	1.03		4.00	1.000	
5. Importance of matching your specific tasks (work) to organizational goals and priorities.	Traditional	7	4.29	0.76	n.s.	3.89	0.928	n.s.
	Experiential	6	4.00	0.89		4.13	0.915	
6. Understanding and using tactics for gaining power and influence.	Traditional	7	4.71	0.76	n.s.	4.10	0.738	n.s.
	Experiential	6	4.33	0.82		4.07	0.884	
7. Considering the objectives of others in order to complete your goals.	Traditional	7	4.00	1.00	n.s.	4.30	0.949	n.s.
	Experiential	6	4.00	1.10		3.73	1.033	
8. Understanding the role of creative thinking.	Traditional	7	4.14	0.69	n.s.	3.90	1.197	n.s.
	Experiential	6	3.67	1.03		3.47	1.246	
9. Understanding that basic leadership behaviors are supporting or opposing ideas, and supporting or opposing others.	Traditional	7	4.29	1.11	n.s.	4.20	0.789	n.s.
	Experiential	6	4.50	0.55		4.60	0.507	
10. Understanding that the goal of a leadership situation is getting the right work done.	Traditional	5	4.80	0.45	n.s.	4.00	1.054	n.s.
	Experiential	5	4.40	0.89		4.43	0.938	
11. Understanding that there are ideas out in the open and there are hidden ideas.	Traditional	5	3.60	1.34	n.s.	3.80	1.033	p<.01
	Experiential	5	4.00	1.23		4.64	0.497	
12. Understanding the application of the "directing" leadership style.	Traditional	5	3.80	0.84	n.s.	4.40	0.516	n.s.
	Experiential	5	4.40	0.89		4.14	0.864	
13. Understanding the application of "participating" leadership style.	Traditional	5	4.00	1.00	n.s.	4.20	0.632	n.s.
	Experiential	5	4.60	0.55		4.36	0.842	
14. Understanding the application of "delegating" leadership style.	Traditional	5	4.00	1.00	n.s.	4.20	0.632	n.s.
	Experiential	5	4.60	0.55		3.64	1.082	
15. Understanding the differences between "directing, participating, and delegating" leadership styles.	Traditional	5	4.20	1.10	n.s.	4.30	0.675	n.s.
	Experiential	5	4.20	1.30		4.29	0.914	
16. Understanding the role of critical reasoning.	Traditional	5	4.00	1.00	n.s.	3.60	0.843	n.s.
	Experiential	5	3.60	1.14		3.86	0.949	

Table 4
MANIPULATION CHECK
A PRIORI PERCEPTIONS OF IDEAL LEADER BEHAVIORS – WOMEN
Analysis of Variance
DV = Ideal Leader Behavior

		N	Mean	Std. Deviation	Statistical Significance
Factor 1: Representation	**Traditional**	9	1.93	0.37	n.s
	Experiential	14	2.07	0.35	
Factor 2: Demand Reconciliation	**Traditional**	9	1.44	0.41	n.s
	Experiential	14	1.60	0.33	
Factor 3: Tolerance of Uncertainty	**Traditional**	9	2.13	0.57	n.s
	Experiential	14	2.29	0.76	
Factor 4: Persuasiveness	**Traditional**	9	1.80	0.33	n.s
	Experiential	14	1.76	0.27	
Factor 5: Initiation of Structure	**Traditional**	9	1.59	0.39	n.s
	Experiential	14	1.77	0.30	
Factor 6: Tolerance of Freedom	**Traditional**	9	2.11	0.36	n.s
	Experiential	14	2.39	0.49	
Factor 7: Role Assumption	**Traditional**	9	1.89	0.30	n.s
	Experiential	14	1.85	0.20	
Factor 8: Consideration	**Traditional**	9	2.02	0.26	n.s
	Experiential	14	2.02	0.60	
Factor 9: Production Emphasis	**Traditional**	9	2.09	0.49	n.s
	Experiential	14	2.15	0.42	
Factor 10: Predictive Accuracy	**Traditional**	9	1.80	0.26	n.s
	Experiential	14	1.86	0.36	
Factor 11: Integration	**Traditional**	9	1.58	0.29	n.s
	Experiential	14	1.79	0.35	
Factor 12: Superior Orientation	**Traditional**	9	1.76	0.37	n.s
	Experiential	14	1.81	0.25	

Table 5
MANIPULATION CHECK
A PRIORI PERCEPTIONS OF IDEAL LEADER BEHAVIORS – MEN
Analysis of Variance
DV = Ideal Leader Behavior

		N	Mean	Std. Deviation	Statistical Significance
Factor 1: Representation	Traditional	9	2.00	0.49	n.s.
	Experiential	5	1.88	0.23	
Factor 2: Demand Reconciliation	Traditional	9	1.73	0.46	n.s.
	Experiential	5	1.48	0.41	
Factor 3: Tolerance of Uncertainty	Traditional	9	2.48	0.52	n.s.
	Experiential	5	2.32	0.50	
Factor 4: Persuasiveness	Traditional	9	1.78	0.46	n.s.
	Experiential	5	1.76	0.36	
Factor 5: Initiation of Structure	Traditional	9	1.57	0.32	n.s.
	Experiential	5	1.78	0.44	
Factor 6: Tolerance of Freedom	Traditional	9	2.10	0.36	n.s.
	Experiential	5	2.04	0.17	
Factor 7: Role Assumption	Traditional	9	1.91	0.48	n.s.
	Experiential	5	1.84	0.27	
Factor 8: Consideration	Traditional	9	2.19	0.45	p<.10
	Experiential	5	1.80	0.12	
Factor 9: Production Emphasis	Traditional	9	2.00	0.47	n.s.
	Experiential	5	2.18	0.54	
Factor 10: Predictive Accuracy	Traditional	9	1.67	0.35	n.s.
	Experiential	5	1.76	0.26	
Factor 11: Integration	Traditional	9	1.69	0.45	n.s.
	Experiential	5	1.64	0.17	
Factor 12: Superior Orientation	Traditional	9	1.76	0.42	n.s.
	Experiential	5	1.66	0.36	

To determine if the men and women respectively had their perceptions affected by the training, we conducted an ANOVA to see if there were statistically significant changes. For the men participants, four factors showed significant shifts in terms of their schema of leaders across the two pedagogical conditions. Factor 2, associated with Demand Reconciliation, represents behaviors associated with resolving conflict. Consistent with the techniques of *Virtual Leader*, where the leader is encouraged to manage conflict in order to create an appropriate degree of tension to enhance productivity, the male students in the experiential condition were more likely to de-emphasize the value of Demand Reconciliation while the male students in the traditional condition were more likely to emphasize it ($p<.045$). This same pattern was repeated whereby Traditional students were more committed to Consideration behaviors, but experiential (VL) students were less likely to value these behaviors ($p<.058$).

Men in both traditional and experiential conditions changed their evaluation of the importance of the role of the leader, but for the men, the change was more pronounced in the

experiential condition (p<.058). Men in the traditional conditions were less likely to value behaviors associated with production while men in the experiential condition were more likely to value them (p<.046). One conclusion from this analysis is that the experiential condition impacted the males in a variety of ways. The behaviors modeled in the game-based simulation and the underlying values present in the game were easily picked up by the participants. Though the same information was covered in the traditional training intervention, the impact on the men's leadership schema was very different for the experiential pedagogy as compared to the traditional pedagogy. Table 6 shows the results of this analysis for men and Table 7 shows the results for women.

Table 6
CHANGE IN LEADERSHIP SCHEMA BY PEDAGOGY: MEN
Analysis of Variance
DV: Degree of Change in Perception of Ideal Leader Behavior

		N	Mean	Std. Dev.	Statistical Significance
Factor 1: Change in Representation	**Traditional**	7	-0.029	0.423	n.s
	Experiential	5	-0.080	0.729	
Factor 2: Change in Demand Reconciliation	**Traditional**	7	-0.200	0.400	p<.045
	Experiential	5	0.440	0.573	
Factor 3: Change in Tolerance of Uncertainty	**Traditional**	7	-0.114	0.348	n.s
	Experiential	5	0.120	0.349	
Factor 4: Change in Persuasiveness	**Traditional**	7	-0.200	0.337	n.s
	Experiential	5	0.040	0.288	
Factor 5: Change in Initiation of Structure	**Traditional**	7	0.257	0.472	n.s
	Experiential	5	0.060	0.416	
Factor 6: Change in Tolerance of Freedom	**Traditional**	7	0.029	0.236	n.s.
	Experiential	5	0.240	0.568	
Factor 7: Change in Role Assumption	**Traditional**	7	0.014	0.329	p<.058
	Experiential	5	0.500	0.464	
Factor 8: Change in Consideration	**Traditional**	7	-0.229	0.330	p<.051
	Experiential	5	0.200	0.332	
Factor 9: Change in Production Emphasis	**Traditional**	7	0.400	0.271	p<.046
	Experiential	5	-0.100	0.489	
Factor 10: Change in Predictive Accuracy	**Traditional**	7	-0.171	0.315	n.s.
	Experiential	5	0.000	0.424	
Factor 11: Change in Integration	**Traditional**	7	-0.171	0.454	n.s.
	Experiential	5	0.200	0.616	
Factor 12: Change in Superior Orientation	**Traditional**	7	-0.171	0.423	n.s.
	Experiential	5	-0.040	0.261	

Table 7
CHANGE IN LEADERSHIP SCHEMA BY PEDAGOGY: WOMEN
Analysis of Variance
DV: Degree of Change in Perception of Ideal Leader Behavior

		N	Mean	Std. Dev	Statistical Sig.
Factor 1: Change in Representation	**Traditional**	9	-0.044	0.445	n.s
	Experiential	14	-0.014	0.546	
Factor 2: Change in Demand Reconciliation	**Traditional**	9	0.111	0.376	n.s
	Experiential	14	0.086	0.366	
Factor 3: Change in Tolerance of Uncertainty	**Traditional**	9	-0.011	0.306	n.s
	Experiential	14	-0.143	0.293	
Factor 4: Change in Persuasiveness	**Traditional**	9	0.089	0.558	n.s
	Experiential	14	-0.007	0.329	
Factor 5: Change in Initiation of Structure	**Traditional**	9	0.133	0.374	p<.025
	Experiential	14	-0.150	0.187	
Factor 6: Change in Tolerance of Freedom	**Traditional**	9	0.056	0.265	n.s.
	Experiential	14	-0.114	0.363	
Factor 7: Change in Role Assumption	**Traditional**	9	0.078	0.402	n.s.
	Experiential	14	0.086	0.321	
Factor 8: Change in Consideration	**Traditional**	9	-0.067	0.265	n.s.
	Experiential	14	-0.036	0.217	
Factor 9: Change in Production Emphasis	**Traditional**	9	-0.078	0.415	n.s.
	Experiential	14	-0.057	0.394	
Factor 10: Change in Predictive Accuracy	**Traditional**	9	0.089	0.459	n.s.
	Experiential	14	-0.229	0.443	
Factor 11: Change in Integration	**Traditional**	9	0.111	0.376	n.s.
	Experiential	14	-0.071	0.412	
Factor 12: Change in Superior Orientation	**Traditional**	9	0.000	0.206	n.s.
	Experiential	14	-0.107	0.276	

The pattern for the women participants between the pre- and post- LBDQ XII questionnaires was quite different from that for the males. Women in the experiential condition were more likely to have changed perception of "initiation of structure" than women in the traditional condition ($p<.025$). The shift combined with their perceived learning regarding the importance of proactive search and generation of ideas, might suggest that women students in the experimental condition experienced a more substantial change in schema on this dimension of leader behavior.

These results show that although both men and women participated in the exact same training experience, at the same time, and with similar a priori assumptions about leaders, men and women seemed to show different patterns of learning based on the pedagogy. Men in the experiential condition indicated a greater magnitude of changes in their perceptions of ideal leader behaviors than did women. Also, men in the experiential condition seemed to learn something that influenced their schemas of leadership in ways that were different than men in the traditional condition. This pattern also occurred in the sample of women but not along the same dimensions

as the men. The learning and schema of both genders were impacted by the use of the experiential pedagogy. The fact that there were more statistically significant changes in factors for the men suggests that the men's schema were impacted by the training to a greater extent than the women.

Did The Training Result in Differences in Leader Effectiveness by Gender?

Differences in perception of Leader Effectiveness were examined using ANOVA. For each gender-based sample, Group was entered in the model as a categorical variable. Results of the analysis are shown in Table 8.

Table 8
EVALUATION OF LEADER EFFECTIVENESS
Analysis of Variance
DV = Perceived Leader Effectiveness

MEN

DV= Perceived Leadership Effectiveness

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.32	1	1.32	0.808	0.386
Within Groups	19.595	12	1.633		
Total	20.915	13			

	N	Mean	Std. Deviation
Traditional	9	12.26	1.32
Experimental	5	12.90	1.19

WOMEN

DV= Perceived Leadership Effectiveness

ANOVA

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	9.375	1	9.375	3.547	0.074
Within Groups	55.513	21	2.643		
Total	64.889	22			

	N	Mean	Std. Deviation
Traditional	9	11.04	1.16
Experimental	14	12.35	1.86

This analysis shows an interesting gender effect from examining the two pedagogies. When the male participants were examined, perception of leader effectiveness as determined by the 360 assessment was not statistically significantly different across the two conditions. The mean rating for men in both conditions was very similar (Trad mean = 12.26, Exp mean = 12.9, p=.386). This

suggests that perceptions of the leader effectiveness of the men were not impacted by the training intervention in phase 1 of the study. Men's understanding and execution of leader behavior were perceived similarly regardless of the training condition. For the women, though, there was a statistically significant difference in the leader effectiveness scores from the two training conditions. For women trained in the traditional way, the leader effectiveness score was significantly lower than women trained using the experiential pedagogy (Trad mean = 11.04, Exp mean = 12.35, p=.07), thus providing weak support for H2a.

This result suggests that the use of game-based simulations that emphasize role play may be particularly valuable for improving the perceived effectiveness of women in the workplace. The simulation provides two benefits. First, it provides a safe environment for women to try different approaches to accomplishing their tasks. Practicing the art of challenging employees/workers or raising tension in a meeting may provide the confidence needed to engage in this kind of behavior in a more realistic setting. Second, within the simulation, the women are rewarded for more aggressive behavior that results in production rather than being sanctioned for such behavior. Thus, this feedback teaches women that initiating actions are perceived positively if they result in improved results. Combined with the results that women in the experiential group learned about the importance of offering and seeking out ideas, as well as the shift regarding their perceptions of leader behaviors associated with initiating structure, these results suggest that these types of simulations can be effective in teaching women how to practice these behaviors associated with providing more specific guidance on policy and leadership issues within the new venture. Given prior research that shows that women are less likely to inject themselves into vigorous business discussions, using a more experiential pedagogy for development of women leaders rather than conventional classroom pedagogy may help women begin to break through the glass ceiling in larger numbers.

Did The Training Result in Differences in Interpersonal Effectiveness by Gender?

In this research, we also examined possible differences in behaviors as indicated by the level of interaction among the people in the model. One of the elements of good leadership is communication and networking. For this analysis a total of 10 possible measurements were created from the socio-grams completed by the participants. The measurements capture multiple ways an individual could interact with others in the simulation. In Table 9 and Table 10 are the results of an ANOVA which shows differences for each gender sample across the two pedagogical conditions.

Table 9
EVALUATION OF LEADER EFFECTIVENESS
Analysis of Variance
DV = Interpersonal Effectiveness

MEN

Important Relationships	Group	N	Mean	Std. Deviation	Statistical Significance
% of all relationships possible	**Traditional**	9	0.38	0.02	n.s.
	Experimental	5	0.41	0.12	
% of all possible relationships in division	**Traditional**	9	0.94	0.08	n.s.
	Experimental	5	0.88	0.18	
% of all possible relationships outside division	**Traditional**	9	0.13	0.04	n.s.
	Experimental	5	0.22	0.10	
% of possible vertical relationships inside division	**Traditional**	9	0.94	0.11	n.s.
	Experimental	5	0.85	0.20	
% of possible horizontal relationships inside division	**Traditional**	8	0.94	0.18	n.s.
	Experimental	3	1.00	0.00	
% of possible vertical relationships outside division	**Traditional**	9	0.00	0.00	p<.05
	Experimental	5	0.20	0.14	
% of possible horizontal relationships outside division	**Traditional**	9	0.37	0.26	n.s.
	Experimental	5	0.41	0.38	
% of times mentioned by others - Inside division	**Traditional**	9	0.67	0.17	n.s.
	Experimental	5	0.70	0.20	
% of times mentioned by others - outside division	**Traditional**	9	0.09	0.08	p<.001
	Experimental	5	0.27	0.07	
% of times mentioned by others - total	**Traditional**	9	0.27	0.07	p<.001
	Experimental	5	0.39	0.04	

Table 10
EVALUATION OF LEADER EFFECTIVENESS
Analysis of Variance
DV = Interpersonal Effectiveness

WOMEN

Important Relationships	Group	N	Mean	Std. Deviation	Statistical Significance
% of all relationships possible	**Traditional**	9	0.27	0.10	n.s.
	Experimental	14	0.31	0.08	
% of all possible relationships in division	**Traditional**	9	0.69	0.21	n.s.
	Experimental	14	0.76	0.22	
% of all possible relationships outside division	**Traditional**	9	0.10	0.08	n.s.
	Experimental	14	0.11	0.12	
% of possible vertical relationships inside division	**Traditional**	9	0.68	0.16	n.s.
	Experimental	14	0.72	0.24	
% of possible horizontal relationships inside division	**Traditional**	7	0.64	0.48	n.s.
	Experimental	13	0.81	0.38	
% of possible vertical relationships outside division	**Traditional**	9	0.00	0.00	n.s.
	Experimental	14	0.05	0.11	
% of possible horizontal relationships outside division	**Traditional**	9	0.38	0.40	n.s.
	Experimental	14	0.24	0.30	
% of times mentioned by others - Inside division	**Traditional**	9	0.80	0.18	n.s.
	Experimental	14	0.70	0.15	
% of times mentioned by others - outside division	**Traditional**	9	0.10	0.06	n.s.
	Experimental	14	0.09	0.09	
% of times mentioned by others - total	**Traditional**	9	0.30	0.06	n.s.
	Experimental	14	0.27	0.07	

Traditionally, women are considered the gender which has better networking and communication skills. Consistent with this stereotype, there was not a pedagogical impact associated with interpersonal interaction among the women. The women trained under both conditions showed similar patterns of engagement and networking across the fictitious setting. In contract, the statistically significant difference among the sample of men suggest that while the experiential pedagogy may not change their perceived effectiveness as leaders, men trained in the experiential condition showed greater levels of networking and interpersonal engagement than those trained using the traditional pedagogy, thus supporting H2b.

DISCUSSION

While many entrepreneurship research efforts have examined differences in men and women, this research is framed to examine the differential impact of pedagogical interventions on men and women for leadership. Thus, the purpose is not to examine how male and female entrepreneurs differ from each other, but rather how men and women may perceive and experience pedagogy differently. This analysis has shown that in circumstances where men and women are

simultaneously experiencing the same pedagogies, differences in learning and behavior may result. In this research, we found that pedagogy impacted women differently than men. Women in the experiential condition were perceived as more effective leaders by their colleagues than women who were trained using traditional pedagogy. This suggests that the actions of women in phase 2 of the training were noticeably different as a result of which pedagogy was used in phase 1. The levels of social interaction by women trained with different pedagogies, however, were not statistically significantly different.

Regardless of type of training in phase 1, men in phase 2 were perceived as similarly effective by their peers in terms of their overall leadership abilities. The experiential pedagogy, however, did seem to impact positively the reported social interactions of men. Men who were trained in phase 1 using the experiential pedagogy communicated more with others in phase 2 than did those undergoing the traditional pedagogy.

Men also seemed to be more impacted by the learning itself, in that there were greater changes in their leadership schema with the experiential condition than with the traditional condition. Men tended to revise their model of leadership differently depending upon what pedagogy was used. Again, although the content itself was similar across the two training interventions in phase 1, what was learned by the students varied by gender.

This study indicates the need for substantially more evaluation of the impact of pedagogy in general, and game-based simulations in particular, and on learning as it is related to gender differences. New technology provides opportunities for new pedagogical tools. Computer-based simulations have long been part of business pedagogy; however, most of these have focused on decision making in organizations (strategy, international business, marketing, etc.). Simulations that involve interpersonal behavior have traditionally been used in the form of simple role plays or in-basket exercises. With the greater sophistication that exists today in the area of computer games and the lifelike avatars that exist in virtual worlds, a new era of simulations has arrived.

If colleges and schools of business are truly to engage in the type of preparation to empower men and women students to be successful entrepreneurs through the development of practical leadership and interpersonal communication competencies, then this study indicates that adoption of more experiential learning pedagogy may have a strong and positive effect in general. Moreover, this research suggests that experiential learning pedagogy based on computer-based simulation may have promise in closing gender-related skill gaps- specifically in helping females improve their perceived leadership effectiveness and in helping males improve their perceived interpersonal communication skills, which are critical skills for entrepreneurs.

LIMITATIONS AND FUTURE RESEARCH

Although the game-based simulation shows much promise in this study, this research is not without limitations. The first of these potential limitations is the quasi-experimental design. As is characteristic of all experiments, this design embodies a certain degree of artificiality since no experiment can capture all of the emotional and psychological factors involved in real life situations. Additionally, while the quasi experimental design has been shown to be effective, there was no true “control” group in this study. A control group would have consisted of a group of students who had no preparation at all. Future research that includes a control group in a replication study could prove beneficial in validating the results of the current study.

Another limitation of this study involved using a relatively small sample of students at one university. This may limit the generalizability of the findings. Future research should focus on replicating this study utilizing larger sample sizes, with varying demographic profiles. A larger,

diverse sample could improve the statistical significance of the findings, and increase the generalizability of the study.

This research also highlights other potential items for future research to address. At a minimum, this research indicates that simulation research should capture and control for gender differences. Additionally, we do not know if the associated learning will eventually be extinguished or if it will be long-lived. Future research might focus on assessments that are carried out over longer periods of time to evaluate whether the findings of this study remain constant over time.

An interesting project would be to repeat this experiment using experienced entrepreneurs. The process of acquiring entrepreneurship skills may eliminate the differences in leadership and communication between genders. However, it is possible that experiences might heightened the differences. Using a sample with experienced entrepreneurs would help to answer this question.

The same basic set-up for the experimentation could be used to test additional skills relevant to entrepreneurs (e.g., self-promotion, negation, self-efficacy) to determine whether there are gender differences that would have an impact on pedagogy. This knowledge could significantly facilitate more effective entrepreneurship education.

Finally, much work is needed to tease out gender differences for role playing, simulation and experiential projects. Do the gender differences for leadership and communication grow as education methodologies increase in complexity? A small difference noted for role-playing within the classroom may be exacerbated when students move to consulting projects with a real world situation or for an internship. The role-playing exercises and simulations can be used to help develop needed skills that may then be practiced in more real world settings.

CONCLUSION

If entrepreneurs are to be successful in an increasingly volatile business environment, they must be empowered to develop skills needed to be effective and productive. Moreover, it is important that universities incorporate training that targets specific gaps in students' skills, including those attributed to gender. This research is significant because we attempt to empirically test our ability to systematically and purposefully develop leadership effectiveness skills in women and interpersonal communication skills in men. We used innovations in technology to develop a training experience to facilitate experiential learning in a controlled environment and then empirically evaluated the transferability, use, and retention of the learning for each gender. The results of this study suggest that computer simulation games may be particularly effective in developing effective leadership skills in women and effective communication skills in men.

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