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Loud and Clear: The Negotiation Game

Daniel J. Finkenstadt, PhD, *Naval Postgraduate School*
Erik Helzer, PhD, *Naval Postgraduate School*
Robert Handfield, PhD, *North Carolina State University*
Arnav Jhala, PhD, *North Carolina State University*

Cleared for Public Release.

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Research Team

Name	Organization	Labor Category
Robert Handfield	NC State University	Principal Investigator (PI)
Daniel J. Finkenstadt	Naval Postgraduate School	Co-PI
Arnav Jhala	NC State University	Senior Research Associate
Erik Helzer	Naval Postgraduate School	Senior Research Associate
Colin Potts	NC State University	Post-doctoral Researcher
Karey Schaffer	Naval Postgraduate School	Administrative PM

Acronyms and Abbreviations

AIRC	Acquisition Innovation Research Center
CO	Contracting Officer
DAL	Data Accessions List
DoD	Department of Defense
MBA	Master of Business Administration
NC	North Carolina
NCSU	North Carolina State University
NPS	Naval Postgraduate School
SAO	Senior Acquisition Official

Acknowledgements

Executive Summary

The research objective of this project was to improve acquisition workforce training, especially on new acquisition concepts and approaches by investigating if/how gamified training approaches could improve training. Acquisition outcomes were heavily dependent on learning and currency of Department of Defense (DoD) workforce in the ever-evolving acquisition ecosystem. New approaches were needed to improve training speed, retention, and interest given learning time-constraints and workforce turnover.

The Naval Postgraduate School (NPS) and North Carolina State University (NCSU) research teams produced a set of negotiation scenarios that were incorporated into an interactive player platform that allowed teams to take on various roles within a negotiation team on either the government or industry side. Players competed against each other and tried to reach the optimal solution for their team given their tasks, constraints, and goals. Researchers assessed how teams interacted given various complex negotiation trades, variations of constraints and asymmetric information.

Analysis of participant feedback showed the exercise was enjoyable, promoted creative problem solving, and had potential benefits for acquisition professionals. However, participants desired more time, structure, clarity in expectations, and accessibility. The positive feedback exhibited a learning orientation, while the negatives reflected a performance focus. Overall, the gamified approach shows promise for enhancing negotiation skills vital for acquisition professionals. This research provides an initial methodology and prototype for gamified negotiation training. Further refinement and testing are needed to optimize game design, player experiences, and learning outcomes. Gamified methods can promote engagement and real-world skills, but careful implementation is required for success.

Background

Previous research by Larsson et al. (2021) found mixed results when comparing gamified defense acquisition training to traditional lecture methods in terms of short-term knowledge retention. Performance depended on specific conditions like student preferences, environments, and learning objectives (Larsson et al., 2021).

A previous Acquisition Innovation Research Center (AIRC) report by Finkenstadt et al. (2022) expanded on this work by developing a methodology for systematically matching game mechanics and player types to acquisition learning goals. Prototypes like an escape room and tower defense game were developed and play tested (Finkenstadt et al., 2022).

The reports show how certain features of games align well with defense acquisition environments. Fantasy and voluntary participation allow for exploration without real consequences, while representation and rules provide realism (Larsson et al., 2021; Finkenstadt et al., 2022). Feedback and do-overs support learning. Games can create low-risk, highly engaging environments to enhance motivation with the material (Larsson et al., 2021; Finkenstadt et al., 2022, Finkenstadt and Helzer, 2023).

Catering games to different player types (achievers, explorers, socializers, killers) can optimize appeal and effectiveness for varied learners (Finkenstadt et al., 2022). Developing a suite of games based on mechanics, player types, and learning goals is an inclusive approach to support acquisition training objectives and learner preferences (Finkenstadt et al., 2022).

In this Phase II study, the Naval Postgraduate School (NPS) and North Carolina State University (NCSU) teams produced a set of negotiation scenarios that were incorporated into an interactive player platform that allowed teams to take on various roles within a negotiation team on either the government or industry side. Players competed against each other and tried to reach the optimal solution for their team given their tasks, constraints and goals. Researchers assessed how teams interacted given various complex negotiation trades, variations of constraints and asymmetric information.

Loud and Clear

1.1 The Game Design and Study

The kickoff of Phase II marked the beginning of the project expansion. After contracts were extended and funding secured, the team developed two negotiation scenarios for the interactive simulation platform. Initial wireframes were started for the user interface design. By mid-May, the complex negotiation scenario was completed, including case study information, guides, character profiles, communication channels, introductory materials, and evaluations.

The first live pilot exercise occurred in May 2023 using the initial prototype simulation. The sample consisted of 14 military Master of Business Administration (MBA) students specializing in contracts management, including one student who was a federal law enforcement officer. Students were divided into government and contractor teams and

participated in the multi-day asynchronous exercise. Two parallel simulations were run with differing timelines and personnel configurations.

Analysis of student feedback highlighted both positives and negatives. On the positive side, students found the exercise enjoyable, valuable for understanding emotions and negotiation, and beneficial for acquisition professionals. They appreciated the opportunity for creative problem-solving with limited information. On the negative side, students felt rushed by time constraints and desired clearer instructions, expectations, rules, and time commitments upfront. Some cited issues with organization, accessibility, and lack of structured briefings.

1.2 Game Experience and Analysis

ChatGPT was used to analyze transcripts of the students open text responses related to the game experiences. The following summary was provided by ChatGPT 3.5 and validated by researchers by reviewing the transcripts post analysis:

Based on the provided transcript, the majority of **positive comments** revolve around the following themes:

> **Enjoyment and valuable experience:** Participants found the game interesting, enjoyable, and valuable, particularly in terms of understanding emotions and the education required for successful negotiation and acquisition.

> **Creative problem-solving with limited data:** Participants appreciated the opportunity to get creative with the limited data available, finding it fun and engaging. They enjoyed the reactions from the Senior Acquisition Official (SAO) during correspondence.

> **Potential benefits for acquisition professionals:** Overall, participants believed that the negotiation exercise/game could be of great benefit to acquisition professionals.

> **Appreciation for the chat platform:** Participants found it refreshing to participate in the scenario through a chat platform, despite possibly expecting a different format such as a video game setting.

On the other hand, the majority of **negative comments** revolve around the following themes:

> **Time constraints and rushed experience:** Many participants felt that the allocated time for playing the game was too short and rushed. They suggested providing more time, ideally starting on a Friday to allow for research and understanding of unfamiliar concepts like a Data Accessions List (DAL).

> **Lack of clarity in instructions and expectations:** Participants recommended clearer expectations and instructions for participation in the game, as well as providing clear rules of engagement and informing players about the time commitment required.

> **Organization and accessibility issues:** Participants expressed frustration with file control and various programs, suggesting that all information be better organized and easily accessible.

Request for more structured approach and briefings: Participants recommended providing briefs to each team separately, outlining their priorities to facilitate a more structured approach to negotiations and deliberations. They also suggested briefing by the SAO with background information and top priorities for a better understanding of the problem.

In summary, the majority of positive comments focused on the enjoyment, creativity, and potential benefits of the game, while the negative comments emphasized time constraints, lack of clarity in instructions, organization issues, and the need for a more structured approach and briefings.

ChatGPT was also taught the differences between learning and performance orientations, as the team has found them to be highly influential in miliary officer experience. GPT provided the following insights:

Positive: Based on the provided transcript comments about the game, the majority of them reflect a learning orientation rather than a performance orientation. Participants expressed a genuine interest in learning and acquiring new knowledge and skills related to negotiation and acquisition. They mentioned the educational aspects of the game, understanding emotions, and the valuable experience gained from navigating the situation. They also appreciated the opportunity to get creative with limited information and enjoyed the learning process. These indicators suggest a focus on increasing competence and mastering new tasks, aligning with a learning orientation rather than solely seeking favorable judgments of competence (performance orientation).

Negative: Upon reviewing the negative comments from the transcript, it appears that they were primarily focused on performance rather than learning. Participants expressed concerns about time constraints, lack of clarity in instructions and expectations, organization issues, and the need for a more structured approach. These concerns indicate a focus on seeking favorable judgments of their competence and avoiding unfavorable ones (performance orientation). Participants desired clearer guidelines, longer timelines, and more structured briefings to enhance their performance within the game. While learning can still occur within a performance-oriented mindset, the emphasis in these negative comments seemed to be on achieving successful outcomes and judgments rather than solely on the learning process itself.

In summary, positive feedback centered on enjoyment, creativity, and potential benefits, while negative feedback focused on insufficient time, unclear expectations, and need for greater structure. Analysis indicates students exhibited a genuine learning orientation in the exercise.
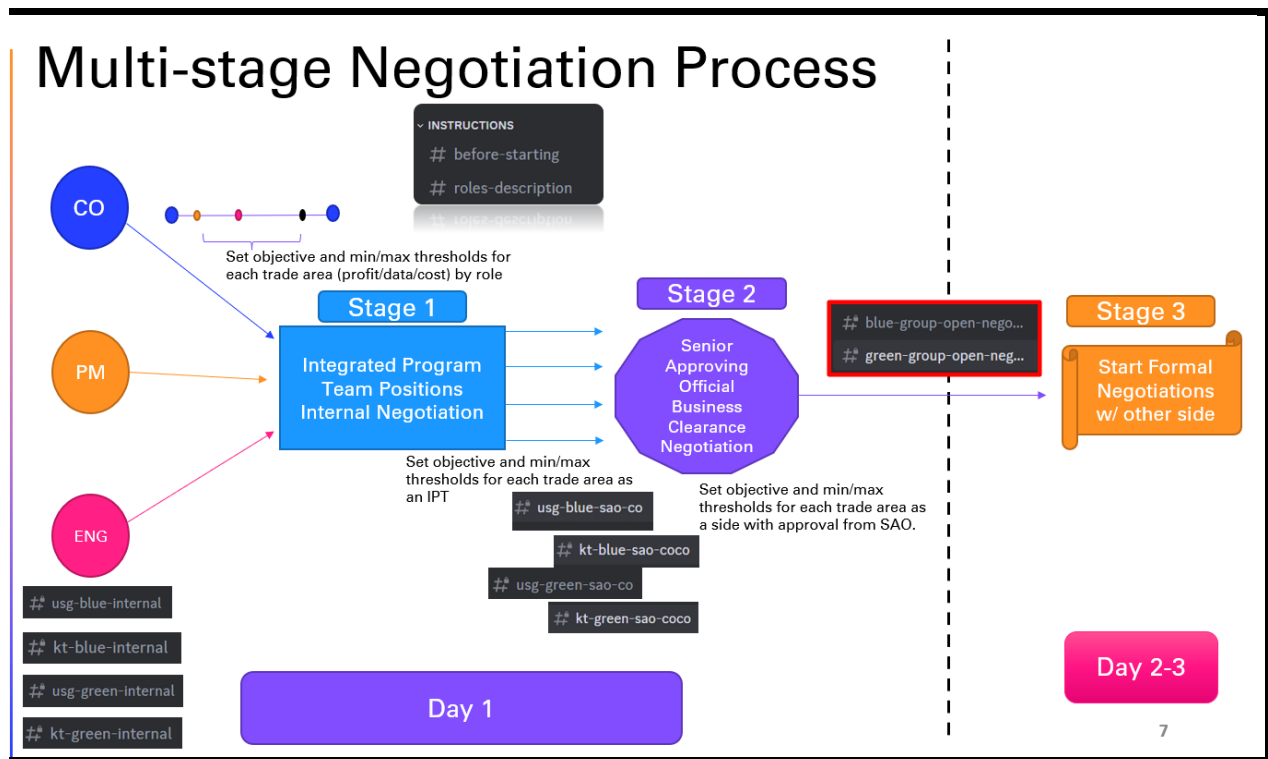
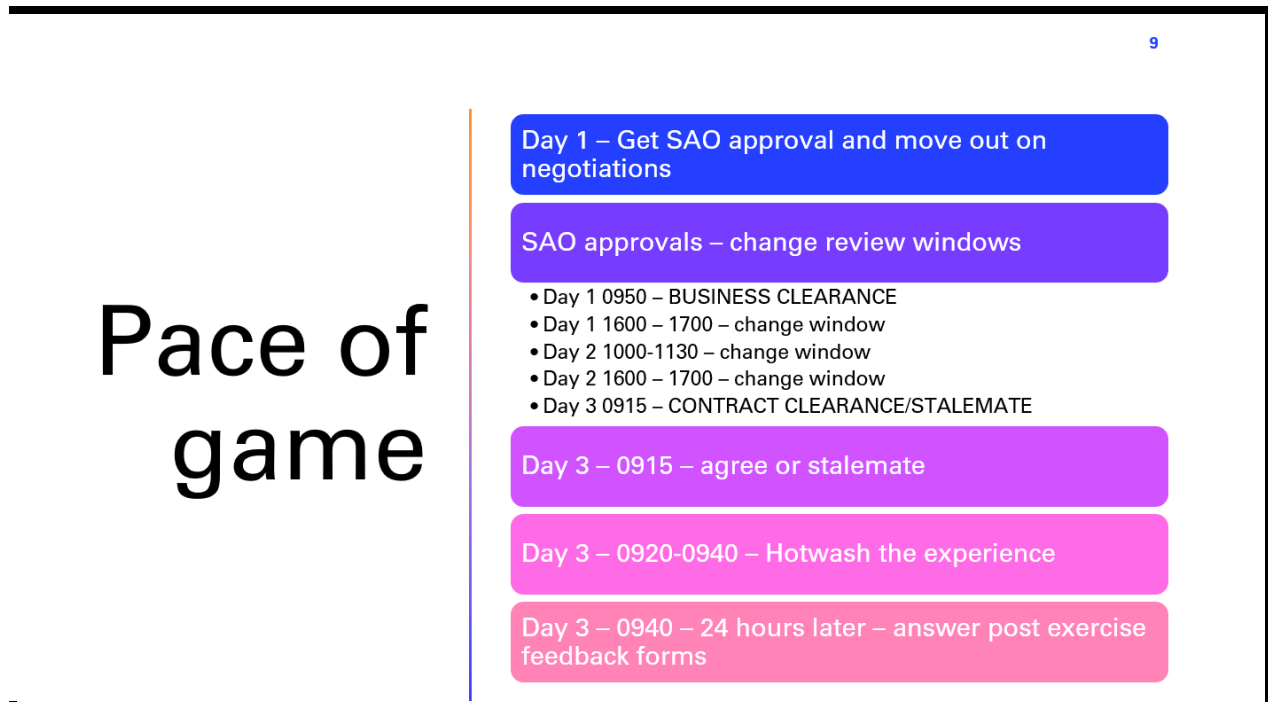Figure 1. Mechanics of 3-stage negotiations

Figure 2. Game Pace for 3-day Pilot Test

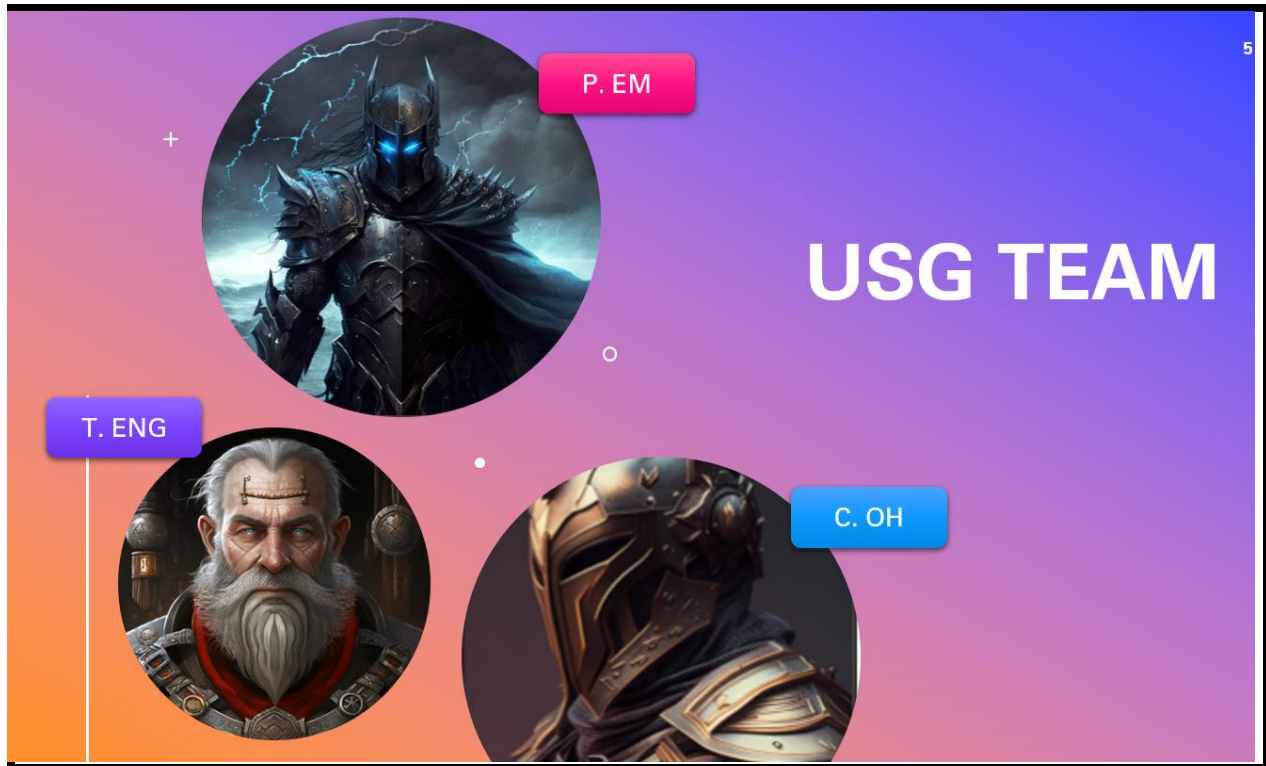**Figure 3. USG Team Characters**

Figure 4. Contractor (KTR) Team Characters

Figure 5. Sample Discord Negotiation Communications for Pilot Test

Figure 6. Student Perceptions of Negotiations Success (1-7 agreement scale), n=13/14 reporting

Figure 7. Perceptions of Negotiation Results (1-7 agreement scale), n=13/14 reporting

Figure 8. Perceptions of Negotiation Objectives (1-7 agreement scale), n=13/14 reporting
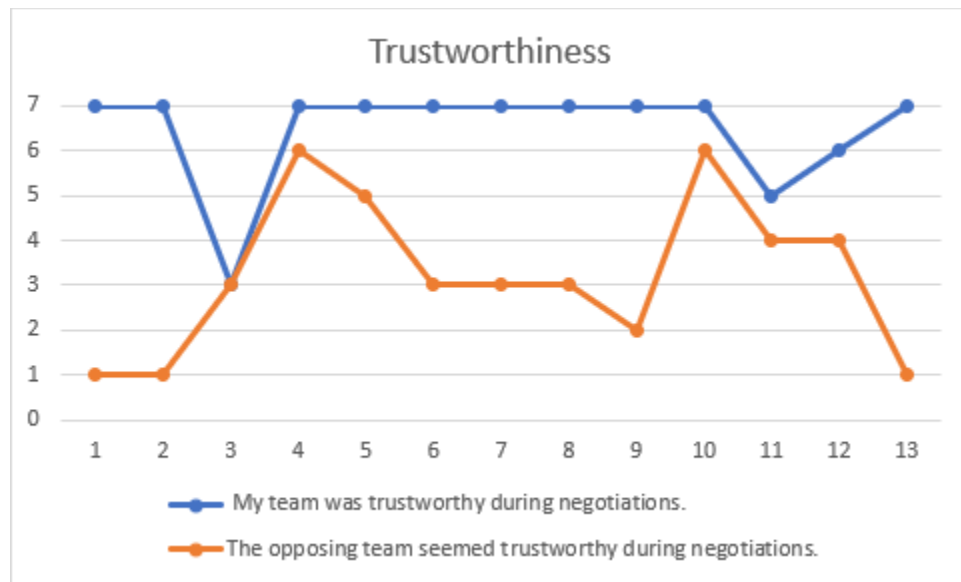
Figure 9. Trustworthiness Perceptions during Negotiations (1-7 agreement scale), n=13/14 reporting
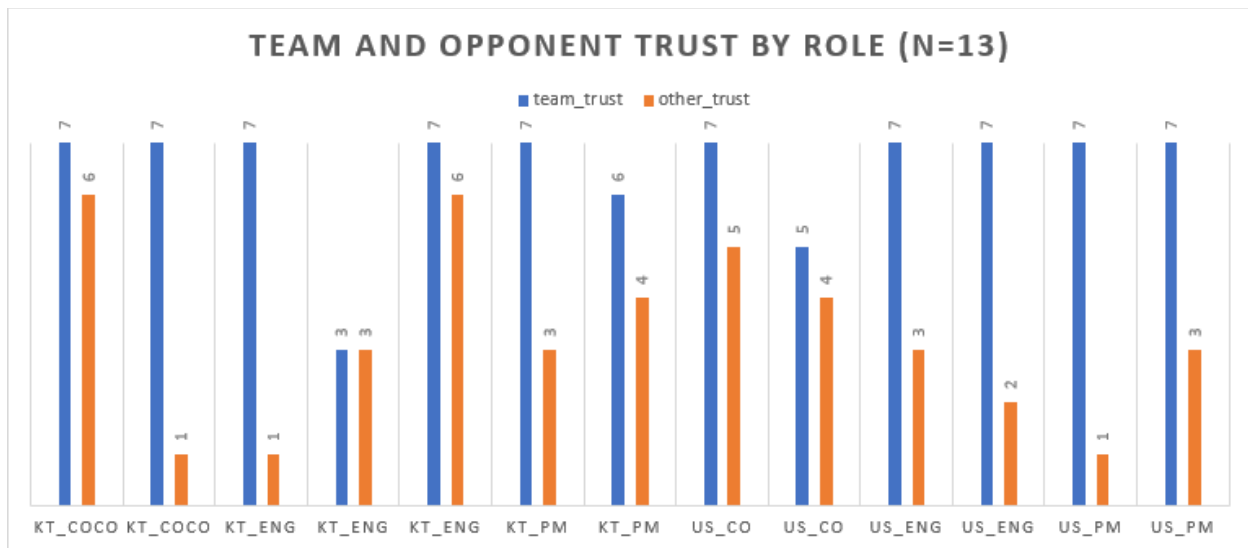
Figure 10. Trustworthiness by Role (1-7 agreement scale), n=13/14 reporting
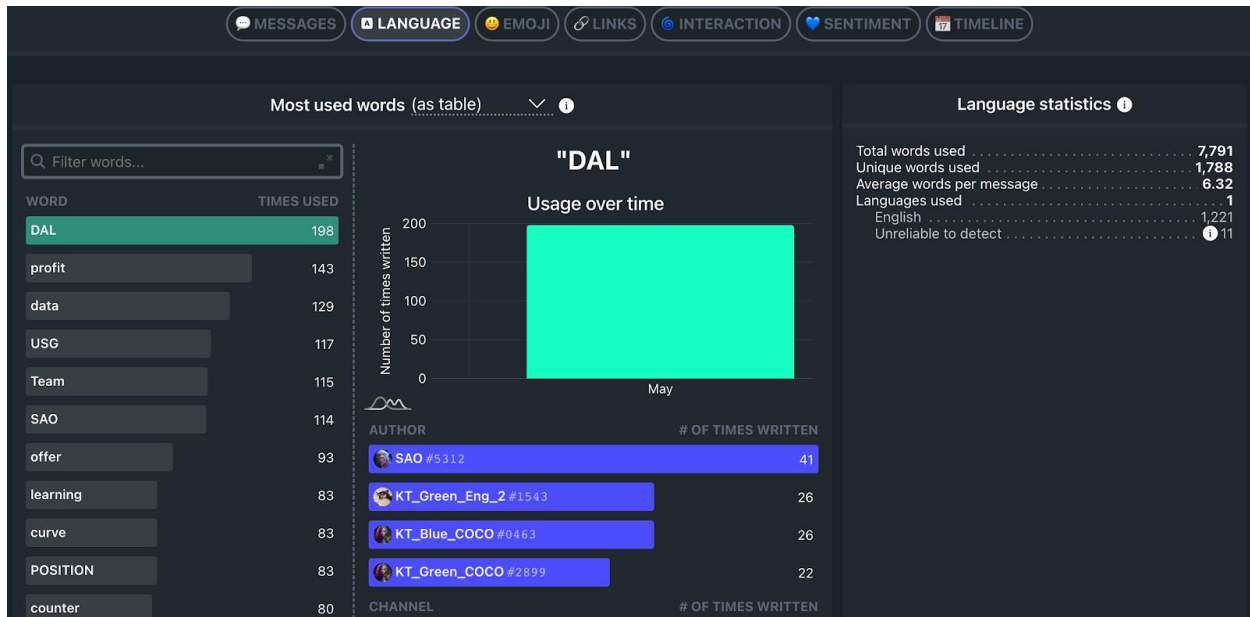
Figure 11. Word Usage within Discord Game Over Time
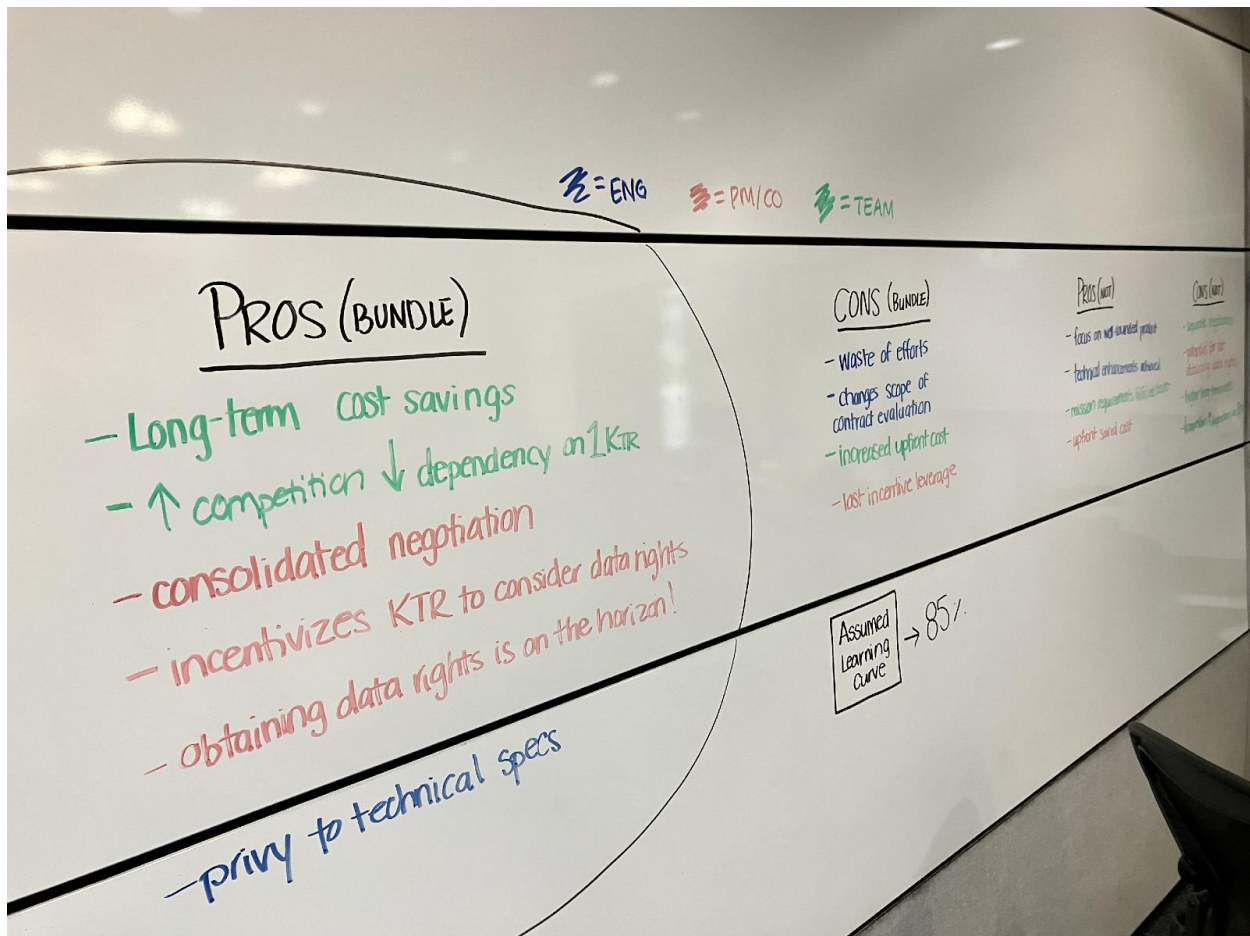
Figure 12. In Class Example of Pro/Con Analysis and Trades

Figure 13 below shows the interface in the Unity game engine. For this game, players enter through an online lobby where the game manager/instructor assigns roles. For each day of the game, information injects are programmed to be released in the app at instructor specified times. Messages can be tagged to indicate significant updates to negotiation positions and other communicative intent. The data generated from these engines is compatible with the formats in which the analysis dashboard (shown in Figure 11) can be used to provide deeper insights to the instructor and trainees.
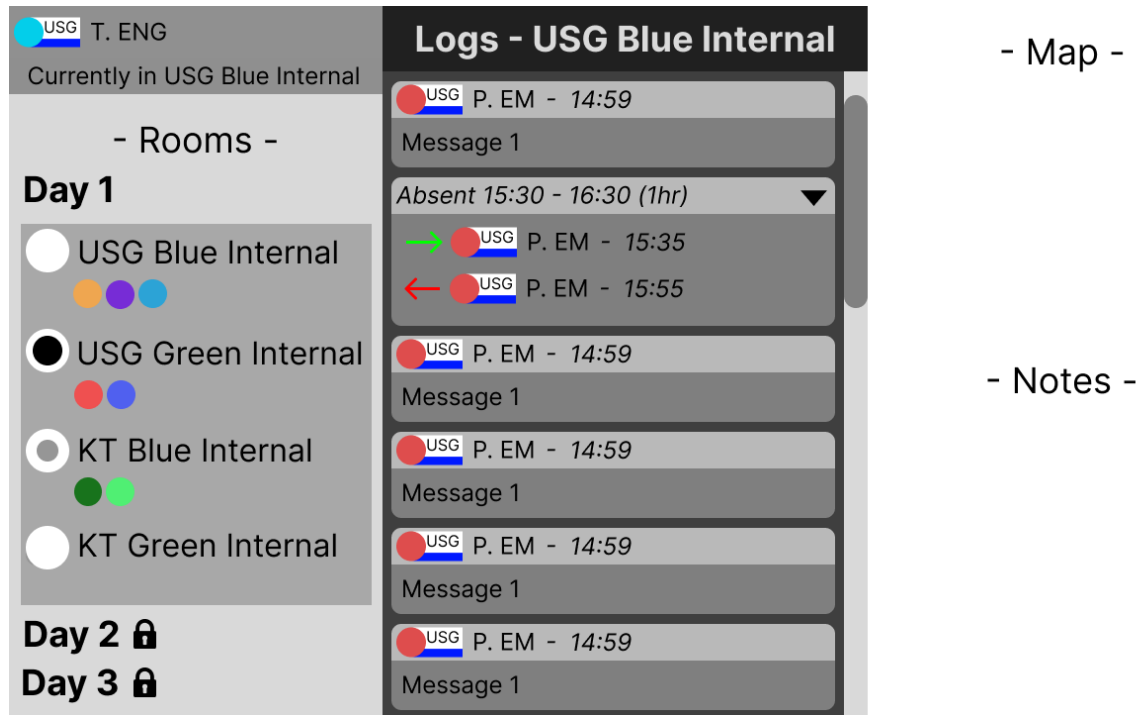
Figure 13. Interface developed based on design feedback from the Discord deployment of the game. Developed in Unity, it is designed to be cross-platform, secure, and compatible with the analysis dashboard.

The research team also developed other situated interfaces that allow players to be situated in a virtual environment to increase immersion and provide immediate feedback on communication. Figure 14 shows a prototype interface using the API library provided by the Gather Town engine.
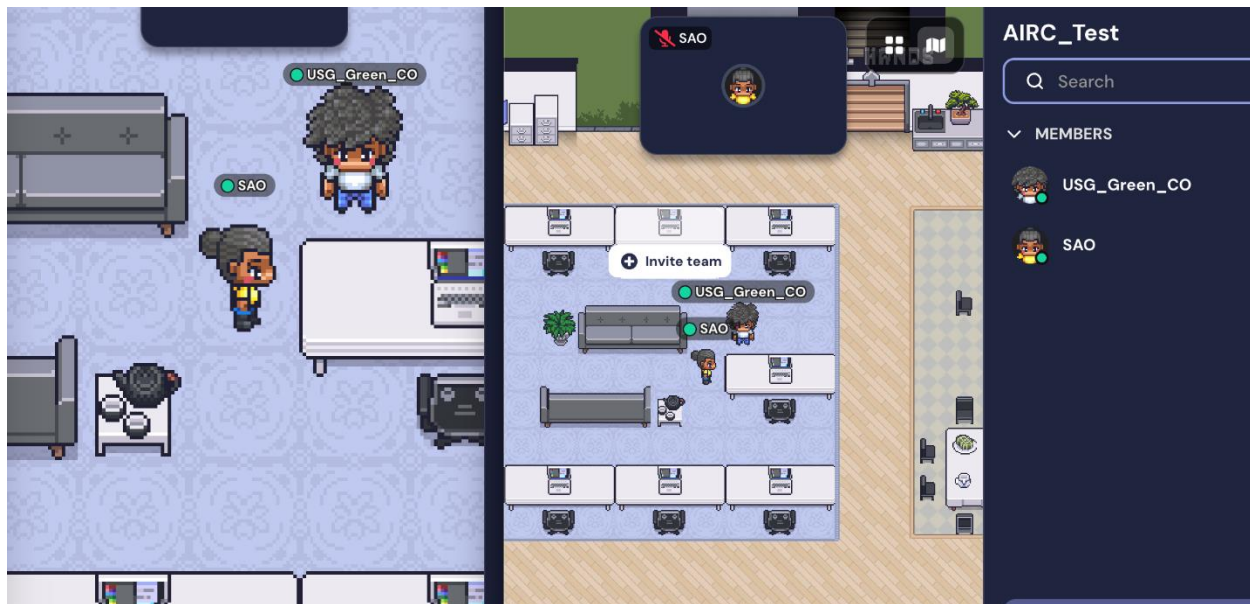
Figure 14. Interface for a virtual situated game to improve immersion and immediacy in conversations that is not provided by asynchronous platforms like Discord. The left and right panels are views for the SAO and Contracting Officer (CO)virtually situated in the negotiation room. Access control can be set up to only allow authorized roles to access meeting rooms.

Conclusions

This research explored the use of gamified training for defense acquisition negotiations. A multi-day asynchronous negotiation simulation was developed and tested with government students participating as government and industry teams. Analysis of participant feedback showed the exercise was enjoyable, promoted creative problem solving, and had potential benefits for acquisition professionals. However, participants desired more time, structure, clarity in expectations, and accessibility. The positive feedback exhibited a learning orientation, while the negatives reflected a performance focus. Overall, the gamified approach shows promise for enhancing negotiation skills vital for acquisition professionals. This research provides an initial methodology and prototype for gamified negotiation training. Further refinement and testing are needed to optimize game design, player experiences, and learning outcomes. Gamified methods can promote engagement and real-world skills, but careful implementation is required for success.

We also offer a proposal for a follow-on effort to build and implement a more robust business and government game development lab at NCSU for designing, developing and testing serious games for government and industry education and training needs related to acquisition and public policy. This proposal is provided as an attachment to our final report. In addition, there is currently a two-day game symposium being planned between members of the DoD and NCSU to be hosted at the NCSU campus in Raleigh, NC in early 2024. The intent is to bring together disparate researchers, players and developers within the DoD's gaming ecosystem to share lessons learned and make resourced connections for future projects.

Appendix A. Loud and Clear Intro Slides

NEGOTIATION GAME: LOUD AND CLEAR

Daniel J. Finkenstadt, PhD
Erik Helzer, PhD
Rob Handfield, PhD
Arnav Jhala, PhD
Colin, Potts, PhD

PROJECT SAURON

Introduction

• The year is 2011. Two teams are faced with a series of negotiations for a high valued space program that has been around since 2000.

• The most recent contract on the program was originally signed in 2008 and consists of four large satellites that are being produced to support United States ISR collection.

• The satellites are being designed, built and delivered on orbit by a large prime contractor named Star Shield Aerospace Corp.

• The satellite program name is Project Sauron, each satellite is numbered… Sauron 1, Sauron 2, Sauron 3, Sauron 4.

• The four "birds", as they are affectionately called, are being delivered in five -year increments from 2013 -2025.

2

Major Trade Possibilities

Cost	Schedule	Operational performance
Modularity for future enhancements	Public scrutiny/compliance	Profit
Cash Flow/Financing	Development Risk	Production Risk
Sustainment Risk	IP/Data Rights	Incentives

3

4

5 Negotiation Styles

Compete (win-lose)

Collaborate (win-win)

Compromise (Split differences)

Accommodation (lose-win)

Avoidance (lose-lose)

USG TEAM

- P. EM
- T. ENG
- C. OH
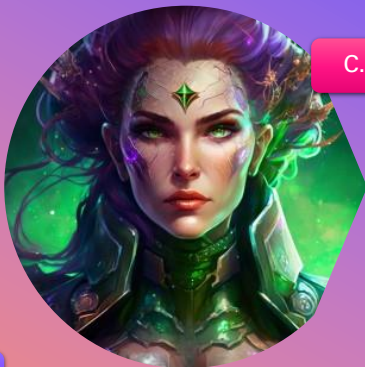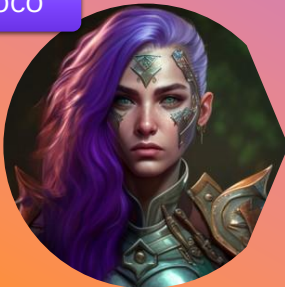
STAR SHIELD KTR TEAM

- C. PRO
- COCO
- K.T. ENG

Multi-stage Negotiation Process

INSTRUCTIONS
- # before-starting
- # roles-description

CO

Set objective and min/max thresholds for each trade area (profit/data/cost) by role

PM

ENG

Stage 1
Integrated Program Team Positions Internal Negotiation

Set objective and min/max thresholds for each trade area as an IPT

Stage 2
Senior Approving Official Business Clearance Negotiation

Set objective and min/max thresholds for each trade area as a side with approval from SAO.

- # blue-group-open-nego...
- # green-group-open-neg...

Stage 3
Start Formal Negotiations w/ other side

- # usg-blue-internal
- # kt-blue-internal
- # usg-green-internal
- # kt-green-internal

- # usg-blue-sao-co
- # kt-blue-sao-coco
- # usg-green-sao-co
- # kt-green-sao-coco

Day 1

Day 2-3

7

Negotiate IPT Position

Trade Parameters set by role

CO

PM

ENG

Send Proposed Positions
Send Proposed Positions
Send Proposed Positions

Send Proposed Positions

Negotiate Side Position

Send Counter Positions

Senior Approving Official Business Clearance Negotiation

SAO approves

CO approves

CO requests parameter amend

CO

Send Proposed Positions

Negotiate Formal Agreement

Other Side

Send Counter Positions

CO approves

8

Pace of game

Day 1 – Get SAO approval and move out on negotiations

SAO approvals – change review windows

- Day 1 0950 – BUSINESS CLEARANCE
- Day 1 1600 – 1700 – change window
- Day 2 1000-1130 – change window
- Day 2 1600 – 1700 – change window
- Day 3 0915 – CONTRACT CLEARANCE/STALEMATE

Day 3 – 0915 – agree or stalemate

Day 3 – 0920-0940 – Hotwash the experience

Day 3 – 0940 – 24 hours later – answer post exercise feedback forms

Appendix B. Loud and Clear Character Sheet Examples

COCO
Ktr Chief of Contracts

PROFILE

As the contractor chief of contracts for the Sauron, Coco is a highly skilled and compromising negotiator who is focused on ensuring a profitable program with favorable data rights and healthy cash flow. Working closely with government counterpart C. Oh, Coco places a strong emphasis on maintaining a fair and trustworthy negotiation process that benefits all stakeholders. Profit rate is a top priority for Coco. In addition, Coco is highly attuned to cash flow considerations, working collaboratively to ensure that the program stays on track and within budget. With a focus on collaboration, transparency, and profitability, Coco is a key player in the success of the Sauron program.

STRENGTHS

1) Strong communicator

2) Collaborative

3) Corporate goal-focused

WEAKNESSES

1) Take cues from program manager for most decisions – lacks final authority

2) Lack of technical skills

3) People pleaser

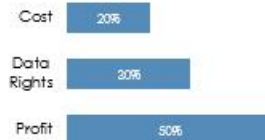**POWERS**

1) Cast Offers

2) Summon Chief Financial Officer

3) Generate Win-Win

WEAPONS

1) Net of Agreement

2) Cloak of Secrecy

3) Oracle of Business Acumen

FOCUS AREAS (100% BASIS)

Focus Area	Percentage
Cost	20%
Data Rights	30%
Profit	50%

P. EM

USG Program Manager

PROFILE

P. Em is a highly skilled government program manager with a strong focus on satellite programs. As a collaborative negotiator, P. Em works closely with stakeholders to ensure that all parties are satisfied with the terms of a contract. One of P. Em's main areas of focus is data rights. P. Em is also highly skilled at managing costs, and is always looking for ways to maximize the value of each contract while keeping expenses under control. In addition, P. Em is able to manage complex schedules and ensure that satellite programs are completed on time and within budget. Another key area of expertise for P. Em is platform performance.

POWERS

1) Cast Money

2) Generate Incentives

3) Spell of Modular Design

WEAPONS

1) Whip of Expediency

2) Risk Razors

3) Oracle of Design

STRENGTHS

1) Highly organized

2) Cost and time conscience

3) Action-oriented

WEAKNESSES

1) Impatient

2) Reactionary

3) Insecure about their inability to make final contract decisions

FOCUS AREAS (100% BASIS)

Focus Area	Percentage
Data Rights	30%
Cost	30%
Performance	20%
Schedule Risk	20%

Appendix C. List of Publications and Presentations Resulted

2023 National Contract Management Association's Government Contract Management Symposium, Washington DC (6-8 Nov 2023).

References

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