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The Efficacy of Optimized Government–Industry–Academia Co-Education for Major Weapon Systems Cost/Price Analysis and Contract Negotiations

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Abstract

The success of delivering and transitioning major weapon systems capabilities at the speed of relevance relies on the collaborative cost/price analysis and contract negotiations process buyers and sellers use to facilitate speed-to-contract award. However, Werber et al. (2019) found that insufficient knowledge of industry operations, risk management, and limited opportunities to attend joint formal education and training events influenced buyer understanding of requirements, cost/price analysis, and contract negotiations (p.120). In response, Werber et al. (2019) identified government–industry collaboration in the form of co-education as a potentially innovative strategy within the ecosystem to minimize these variations and related knowledge gaps (p.120). This study, which was a collaborative effort between graduate students in the Department of Defense Management at the Naval Postgraduate School and buyers and sellers from a major weapon system program office in the Midwest, explored perceptions on the efficacy of co-education for major weapon systems cost/price analysis and contract negotiations to minimize these variations using a common language software package, ProPricer Government Edition (GE). These findings indicate that this approach enables an open and honest transfer of data, information, and knowledge, facilitated by the practical use of ProPricer GE, to support collaboration and innovation, enhancing trust in buyer–seller relationships.

Introduction

Defense Acquisition System (DAS) buyers and sellers often attempt to conduct major weapon systems cost/price analysis and sole-sourced contract negotiations at the speed of relevance across 75 Major Defense Acquisition Programs (Office of the Under Secretary of Defense, Comptroller/Chief Financial Officer, 2023, p. 5). However, in a dynamic 21st-century national security environment, the Department of Defense’s (DoD’s) legacy acquisition system is still too slow to be competitive, only incrementally innovative, and optimized to a peacetime cadence inconsistent with the current speed of the great power competition (Congressional Research Service [CRS], 2023, p. iii; Kotila et al., 2023, p. 1; Wong et al., 2022, p. ix). One reason for this suboptimal peacetime cadence is the variation in buyer and seller predecessor education, training, and practice before buyers and sellers conduct cost/price analysis and contract negotiations. DAS buyers and sellers typically undergo specialized training at the individual, group, or organizational level specific to the agency or attend industry conferences and professional workshops. These education, training, and practice activities are rarely joint, creating the conditions for buyers and sellers to enter major weapon systems cost/price analysis and contract negotiations with varying and often conflicting degrees of competence (Werber et al., 2019. p. 124). Werber et al. (2019) identified government–industry co-education as an innovative strategy to address these variations and knowledge gaps (p.120). The researchers



also highlighted two specific areas of government–industry co-education—industry rotations and industry resources (i.e., participants, presenters, standards, etc.) in internal training and development—and recommended government–industry interactions earlier in career development stages (Werber et al., 2019, p. 120).

Government–Industry–Academia Co-Education

Government–industry–academia co-education (G-I-A Co-Ed) builds upon government–industry co-education (Werber et al., 2019, p. 20) by leveraging Etzkowitz’s (2003) Triple Helix Theory. This theory suggests that the key to enhancing innovation in a knowledge-based society lies in the university–industry–government interaction (p. 295). Within this triple helix, the industry serves as the production hub, the government provides contractual relationships, and the university (academia) is the wellspring of new technology and knowledge (Etzkowitz, 2003, p. 235). In *The New Economics for Industry, Government, and Education*, Deming (2018) described this interaction as an opportunity for management to redefine traditional boundaries and better serve the system’s aim (p. 37). According to Deming (2018), everyone—stockholders, suppliers, employees, and customers—benefits from an optimized system (Location, 447). Deming’s (2018) perspective on optimization involves understanding the interdependencies within the defense acquisition ecosystem, knowledge about variations, and the notion that each stage should benefit from more effort than the next stage or step (p. 93). In the context of the major weapon cost/price analysis and contract negotiations process (Table 1), optimization necessitates a consensus on buyer and seller roles within the ecosystem and knowledge about variations in education, training, and practice across these twelve steps, with an emphasis on understanding the cumulative effect on the cost/price analysis and sole-source contract negotiations process timelines (Deming, 2018, pp. 63–68).

Table 1. Major Weapon Systems Cost/Price Analysis and Contract Negotiations Process

Steps	Activity
1	Requirements Planning
2	Release Draft Letter Request for Proposal (RFP)
3	Approve Program/Project
4	Release RFP
5	Receive Proposal
6	Conduct Fact/Finding and Develop Technical Evaluation
7	Complete Pre-Price Negotiation Memorandum (Cost/Price Analysis)
8	Receive Business Clearance
9	Conduct Contract Negotiations
10	Complete Final Price Negotiation Memorandum
11	Receive Contract Clearance Approval
12	Award Contract

The optimization process, thus, must consider how ecosystem domains (i.e., education, training, practice, and execution) interact and influence each other toward contributing to DAS performance outcomes (Deming, 2018, p. 65).



Drucker's Five Essential Statements

Drucker et al. (2015) expanded Deming's (2018) perspective on optimization for DAS buyers and sellers through five essential statements (Location, 264). The first question is *What is our mission?* This question involves understanding the current mission, challenges, opportunities, and a growth mindset to consider if the mission requires revision (p. 6). For Drucker et al. (2015), this question includes a self-assessment to analyze challenges and opportunities to determine desired outcomes and results (p. 9). This approach begins with the end in mind and then suggests actionable steps to get there (Drucker et al., 2015, p. 9). Therefore, major weapon system buyers and sellers must consider an optimized cadence that supports a dynamic 21st-century national security environment. The second question is *Who is the customer?* Embedded in this question is the requirement to identify primary and helping customers and how these customers change over time (Drucker et al., 2015, p. 18). In the context of major weapon systems cost/price analysis and contract negotiations, multiple stakeholders across multiple domains comprise primary customers. For example, primary customers include the buyers and sellers in the education, training, and practice domains. However, buyers and sellers then transition from primary customers in these domains to supporting customers in the execution domain—when buyers and sellers conduct cost/price analysis and negotiations to deliver capabilities to the warfighter, the primary customer. Accordingly, “customers are never static” (Drucker et al., 2015, p. 21), and the ecosystem domains, among other things, must account for primary customers, supporting customers, and inter-domain transitions.

A related third essential question is *What does the customer value?* According to Drucker et al. (2015), external and internal customers base their needs on the realities of the situation and will behave rationally based on the circumstances (p. 33). In addition to accounting for primary supporting customer inter-domain transitions, the ecosystem must also account for the associated changes in customer needs and values in the process (i.e., changing values across education, training, practice, and execution domains). The fourth question is *What are our results?* This question includes a consensus on defining results, establishing metrics, and deciding what to keep or remove (Drucker et al., 2015, p. 45). This question assists each domain in learning, self-correcting, and understanding the cumulative effect on the overall process (Drucker et al., 2015, p. 53). Conversely, when one domain measure is independent of the others, conditions for casual unsystematic observations exist, limiting the understanding of how one domain affects the other and, by extension, overlooking the cumulative effect on the system. Drucker et al.'s (2015) fifth question centers on *What is the plan?* This question involves five elements: (1) deciding to abandon what does not work, (2) strengthening what does work, (3) creating conditions for innovation, (4) taking risks, and (5) analyzing and studying an essential performance area (p. 65).

Enhancing Buyer–Seller Trust Through Experiential and Interactive Learning

Consistent with Drucker et al.'s five essential questions, Handfield (2019) identified multi-stakeholder relationships, real-time analytics, and shared innovation risk as foundational concepts to support enhancing buyer–seller trust relationships (p. 195). With velocity emerging as the outcome performance metric for defense acquisition ecosystem buyers and sellers, analytics must support trust across multiple stakeholders, and the contractual guidelines should support shared innovation risk (Handfield, 2019, p. 198). This departure from the traditional buyer–seller relationship highlights the need for a new form of governance (Handfield, 2019, p. 198). The new form of governance, therefore, must consider a comprehensive plan. One approach to this comprehensive plan is to begin with experiential learning in a G-I-A Co-Ed environment. Kolb's (1984) experiential learning cycle is a widely accepted foundational model



for adult learning (Morris, 2020, p. 1064). This model supports a cyclical process of learning experiences involving

1. concrete experiences, which include new experiences without bias;
2. reflective observations, which emphasize reflection on experiences from multiple perspectives;
3. abstract conceptualizations, which underscore creating concepts that assist in synthesizing into logically sound theories; and
4. active experimentation, using the theories to make decisions and solve problems (p. 30).

Consistent with the benefits of Kolb's (1984) experiential learning theory, Poree (2023) found that 83 of 111 U.S. military graduate students who completed Naval Postgraduate School cost/price analysis and contract negotiation courses between Winter 2021 and Summer 2022 agreed that active experimentation with the complementary software platform ProPricer GE enhanced critical thinking and problem-solving skills (p. 441). ProPricer GE integration into Naval Postgraduate School courses was based on the development of the 2018 DoD Sole Source Streamlining Toolbox, which highlighted that a "significant number of contractors use ProPricer software application for proposal development and analysis" (p. 4). Moreover, Cooper (2022) noted that approximately 70% of the major weapon system contractors use ProPricer, with a limited number of government agencies using the complementary proposal analysis software ProPricer GE (pp. 1–2). Given the favorable results with U.S. military officers and civilian populations, Poree (2023) recommended that future researchers extend co-education in the classroom to buyers and sellers from the execution domain or mission area.

Methods

This section outlines the research design, participant selection, and data collection procedures to explore the efficacy of optimized G-I-A Co-Ed for significant weapon systems cost/price analysis and contract negotiations.

Research Design

The research design included a qualitative approach with triangulation based on the need to understand various perspectives and opinions (Bryman, 2016, p. 386). According to Yin (2018), the major strength of a case study is the opportunity to use different data sources (p. 126).

Participants

The study included a purposive sample of two government buyers, two industry sellers supporting a major weapon systems program office in the Midwest, and 27 graduate students enrolled in MN3320, Cost/Price Analysis, and MN3321, Contract Negotiations, at the Naval Postgraduate School in Monterey, CA. Participants were selected based on their willingness to participate in the study and graduate students enrolled in the courses as part of the 815 Master of Science in Contract Management Curriculum. The class also included video recordings for buyers and sellers actively engaged in the mission area. Table 2 shows the total class population and a class percentage breakout. Thirteen U.S. Army graduate students comprised 42% of the participants; nine U.S. Navy graduate students, 29%; three U.S. Marine Corps graduate students, 10%; two U.S. Air Force graduate students, 6%; and two government buyers and two industry sellers, 6% and 6%, respectively.



Table 2. G-I-A Co-Ed Participants

Participants	Total Population	Class Percentage
U.S Army	13	42%
U.S. Navy	9	29%
U.S. Marines	3	10%
U.S. Air Force	2	6%
Government Buyer	2	6%
Industry Seller	2	6%
Total Class Population	31	100%

Data Collection Procedures

A 20-statement survey captured the data to understand the perceptions and opinions on optimized G-I-A Co-Ed, using a 7-point Likert scale. The scale ranged from Strongly Disagree, Somewhat Disagree, Disagree, Undecided, Agree, Somewhat Agree, to Agree Strongly. The survey opened on March 4, 2025, and closed on March 29, 2024.

Results

The results centered around the primary research question: How do participants perceive the efficacy of optimized G-I-A Co-Ed to enhance buyer and seller high-trust collaboration and innovation? Table 3 shows a population of 31 academic student buyers and sellers, including those from the mission area. Eighteen responses produced a response rate of 58%, with 62% of academic student buyers, 54% of academic student sellers, 100% of government buyers, and 50% of industry sellers completing the survey.

Table 3. G-I-A Co-Ed Survey Response Rates

Population	Total Population	Responses	Response Rate
Academia Student/Buyers	13	8	62%
Academia Student/Sellers	14	7	50%
Government Buyers	2	2	100%
Industry Sellers	2	1	50%
Total	31	18	58%

As depicted in Figure 1, 15 (or 83%) of the participants had less than 1 year of major weapon system cost/price analysis and contract negotiation experience, one (or 5.56 %) had 1 to 5 years of experience in this domain, one (or 5.56%) had 16 to 20 years of experience, and one (or 5.56 %) had between 21 and 25 years of cost/price analysis and contract negotiations experience.



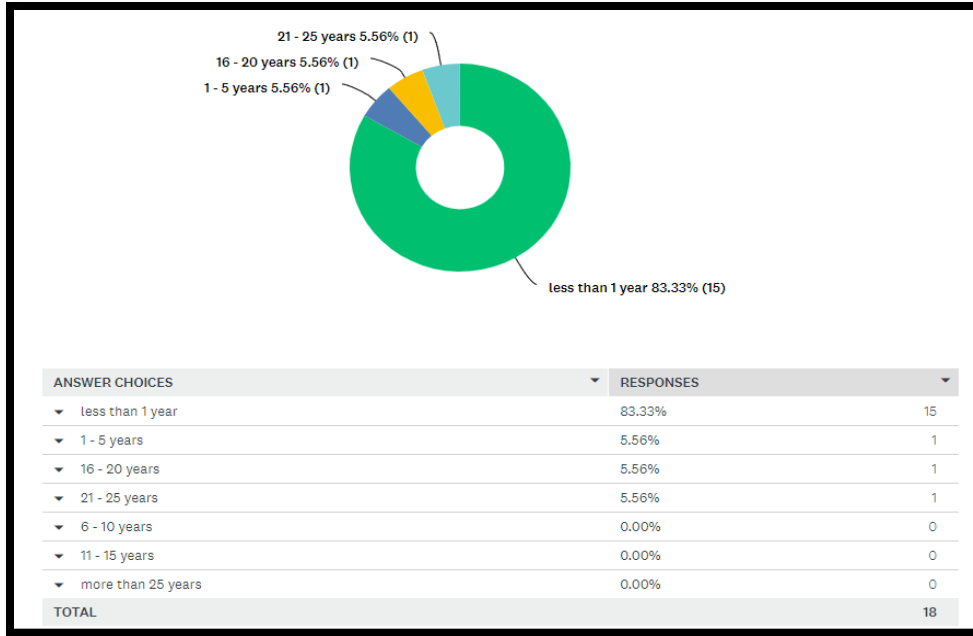


Figure 1. G-I-A Co-Ed Participant Years of Experience

Key Findings

Figure 2 shows the survey results for the 17 Likert scale statements, emphasizing Agreed, Somewhat Agreed, and Strongly Agreed as the primary outcomes. Statements 1 and 2 centered on participant type and years of experience and, therefore, were omitted. These results were categorized into three key findings that support the efficacy of optimized G-I-A Co-Ed for major weapon systems cost/price analysis and contract negotiations.

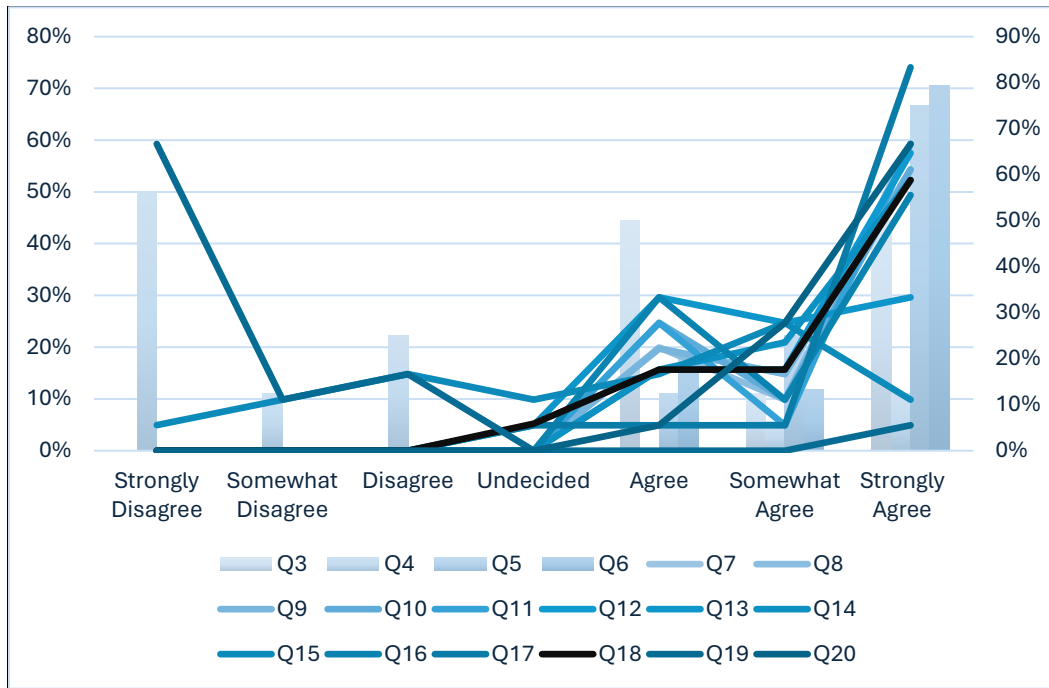


Figure 2. G-I-A Co-Ed Survey Results



Variations Exist in Buyer–Seller Education, Training, and Practice Domains

- **Statement 3.** 44% of the respondents Strongly Agreed, 11 % Somewhat Agreed, and 44% Agreed that variations exist in buyer and seller education, training, and practice for major weapon system cost/price analysis and contract negotiations.
- **Statement 4.** 50% Strongly Disagreed, 11% Somewhat Agreed, and 22% Disagreed that education, training, and practice variations DO NOT negatively affect buyer and seller abilities to conduct major weapon system cost/price analysis and contract negotiations.

G-I-A Co-Ed Minimizes Variations in Buyer–Seller Education, Training, and Practice

- **Statement 5.** 67% of the respondents Strongly Agreed, 22% Somewhat Agreed, and 11% Agreed that G-I-A Co-Ed provides insight into buyer and seller motivations, operations, and perspectives on cost, schedule, and performance risks.
- **Statement 6.** 71% of the respondents Strongly Agreed, 12% Somewhat Agreed, and 18% Agreed that active experimentation with ProPricer GE in G-I-A Co-Ed enables work traceability and a systematic approach to analyzing work breakdown structures, tasks, and the associated basis of estimates.
- **Statement 7.** 61% of the respondents Strongly Agreed, 17% Somewhat Agreed, and 22% Agreed that active experimentation with ProPricer GE in G-I-A Co-Ed enables a systematic approach to fact-finding.
- **Statement 8.** 67% of the respondents Strongly Agreed, 11% Somewhat Agreed, and 22% Agreed that using ProPricer GE in the G-I-A Co-Ed enables a systematic approach to establishing minimum, objective, and maximum positions.
- **Statement 9.** 61% of the respondents Strongly Agreed, 11% Somewhat Agreed, and 22% Agreed that active experimentation with ProPricer GE in G-I-A Co-Ed enables a systematic approach to provide offers and counteroffers in the negotiations process.
- **Statement 10.** 61% of the respondents Strongly Agreed, 11% Somewhat Agreed, and 28% Agreed that active experimentation with ProPricer GE in G-I-A Co-Ed enhanced understanding of fair and reasonable determinations for buyers and sellers.
- **Statement 11.** 67% of the respondents Strongly Agreed, 6% Somewhat Agreed, and 28% Agreed that participating in G-I-A Co-Ed earlier in the buyer and seller professional development process could increase individual competence in major weapon systems cost/price analysis and contract negotiations.

G-I-A Co-Ed Enhances Buyer and Seller Trust, Collaboration, and Innovation

- **Statement 12.** 65% of the respondents Strongly Agreed, 18% Somewhat Agreed, and 18% Agreed that participating in G-I-A Co-Ed earlier in the buyer and seller professional development process could increase the organizational capability to deliver major weapon systems on time and within budget.
- **Statement 13.** 33% of the respondents Strongly Agreed, 28% Somewhat Agreed, 33% Agreed, and 5.56% were Undecided on whether participating in G-I-A Co-Ed enhances trust in the buyer–seller relationship required to deliver warfighter capabilities.
- **Statement 14.** 59% of the respondents Strongly Agreed, 24% Somewhat Agreed, and 18% Agreed that participating in G-I-A Co-Ed (and using ProPricer GE) supports an open and honest transfer of data, information, and knowledge.
- **Statement 15.** 11% of the respondents Strongly Agreed, 28% Somewhat Agreed, 17% Agreed, 11% were undecided, 17% Disagreed, 11% Somewhat Disagreed, and 6% Strongly Disagreed that using ProPricer GE in a G-I-A Co-Ed context limits the ability of buyers and sellers to act opportunistically.



- **Statement 16.** 56% of the participants Strongly Agreed, 11% Somewhat Agreed, and 33% Agreed that participating in G-I-A Co-Ed improves understanding of buyer and seller motivations, behaviors, and trends that shape intelligent business decisions.
- **Statement 17.** 83% of the participants Strongly Agreed, 6% Somewhat Agreed, 6% Agreed, and 6% were Undecided on the extent to which exposure to buyers and sellers from the mission area enhanced understanding of the challenges associated with leading major weapon systems buyers and selling organizations in a dynamic 21st-century national security environment.
- **Statement 18.** 59% Strongly Agreed, 18% Somewhat Agreed, 18% Agreed, and 6% were Undecided on whether participation in G-I-A Co-Ed creates the conditions for forging and enhancing trust relationships between buyers and sellers.
- **Statement 19.** 67% Strongly Disagreed, 11% Somewhat Disagreed, 17% Disagreed, and 6% Agreed that trust IS NOT essential for buyers and sellers conducting major weapon system cost/price analysis in a dynamic 21st-century national security environment.
- **Statement 20.** 67% of respondents Strongly Disagreed, 28% Somewhat Disagreed, and 6% Agreed that G-I-A Co-Ed creates the environment for buyer/seller collaboration and conditions for innovation.

Secondary measures included student course evaluation form (CEF) scores and comments in Table 4 and Table 5. Table 4 shows a total response rate of 100% (27 of 27 through frequencies of 24, 2, and 1) related to student perspectives on course learning and a response rate of 100% for 23 and 4 related to student perspectives on course content and design.

Table 4. Academia Student Buyer and Student Seller Course Evaluation Form Scores

Question: What you learned in the course	MAX	MIN	AVG	STDEV	VAR	Frequency	Frequency	Frequency	Frequency	Frequency
						of 5	of 4	of 3	of 2	of 1
						Rating	Rating	Rating	Rating	Rating
1.1. I developed new skills and abilities.	5	3	4.81	0.48	0.23	23	3	1	0	0
1.2. I improved my understanding of the subject.	5	4	4.89	0.32	0.1	24	3	0	0	0
1.3. I strengthened my analytic capabilities.	5	4	4.93	0.27	0.07	25	2	0	0	0
1.4. I enhanced my ability to think critically.	5	3	4.85	0.46	0.21	24	2	1	0	0
1.5. Overall, I learned a great deal.	5	3	4.9	0.46	0.2	24	2	1	0	0
Question: Content and design of the course	MAX	MIN	AVG	STDEV	VAR	Frequency	Frequency	Frequency	Frequency	Frequency
						of 5	of 4	of 3	of 2	of 1
						Rating	Rating	Rating	Rating	Rating
2.1. The course material engaged me in the subject matter.	5	4	4.81	0.4	0.16	22	5	0	0	0
2.2. The course assignments reinforced course content.	5	5	5	0	0	27	0	0	0	0
2.3. The course content was relevant to my program of study.	5	4	4.96	0.19	0.04	26	1	0	0	0
2.4. This course was academically challenging.	5	3	4.59	0.57	0.33	17	9	1	0	0
2.5. Overall, the course was well designed.	5	4	4.9	0.36	0.1	23	4	0	0	0

Overall, the results revealed that student buyers and student sellers developed new skills and abilities and improved their understanding of the concepts and activities associated with major weapon systems cost/price analysis and contract negotiation, with scores of 4.82 / 5.00 (or 96%) and 4.89 / 5.00 (or 98%), respectively. Regarding course design, respondents scored the relevance of the course content to the program of study 4.96 / 5.00 (or 99%).

Table 5 captures 10 student-related comments.



Table 5. Participant Comments

Number	Comments
1	“The course was challenging and rewarding. It provided real-world experiences and points of view from civilians currently in the work field. I learned a lot that I can apply in my career field.”
2	“Incorporation of industry and external acquisition professionals provides unique insight into the challenges we face outside the classroom. Using new and innovative contract pricing tools (ProPricer GE) was enlightening, and I saw that progress can be made in efficiency and effectiveness.”
3	“Excellent interactivity with the class; the course is well designed to promote learning by doing.”
4	“The course was well designed to integrate government and industry in the educational setting to better prepare students for the realities of the mission.”
5	“The co-education between the government and seller representatives was beneficial.”
6	“Integrating software to the academic environment.”
7	“Industry partner presence. Choice of case studies. Tutorial Support. Take home lab assignments. Group assignments”
8	“The course was a good blend of student experience, industry inputs and point of views in the form of guest appearance, and customized course content lead by Prof. Poree.”
9	“Continue implementing guest attendance for real-world civilians. Their perspective was beneficial for altering the government’s mindset and point of view. Pro Pricer was a great program to practice with and learn.”
10	“Interacting with ProPricer and industry partners was eye-opening. Negotiating among classmates was a great learning experience. Seeing how two groups reached different outcomes (yet still sealed the deal) highlights the complexity of issues we will face when we return to the field.”
11	“I watched the last lecture, during which you demonstrated ProPricer with the IGCE and seller’s proposal. ProPricer would have been awesome when I was a buyer a/o PCO! It makes everything SO MUCH EASIER!”
12	“Buyers and sellers have different education, training, and practice paths.”

Discussion

The efficacy of optimized G-I-A Co-Ed for major weapon systems cost/price analysis and contract negotiations survey result, associated CEF scores, and related comments center on overarching themes: (1) variations exist in education, training, and practice domains; (2), G-I-A Co-Ed minimizes variations in education, training, and practice domains; and (3) G-I-A Co-Ed enhances buyer–seller trust, collaboration, and innovation. While a promising first step, readers should cautiously interpret findings based on (1) the limited number of government and industry participants and (2) the scope of this study, which includes Steps 5 to 12 and not Steps 1 to 4 in Table 1.



The top section of Figure 3 depicts variations in education, training, practice, and execution in the “as-is” in major weapon systems buyer and seller cost/price analysis and contract negotiation. The bottom section captures the optimized G-I-A Co-Ed MN3320/21 Cost/Price Analysis and Contract Negotiations.

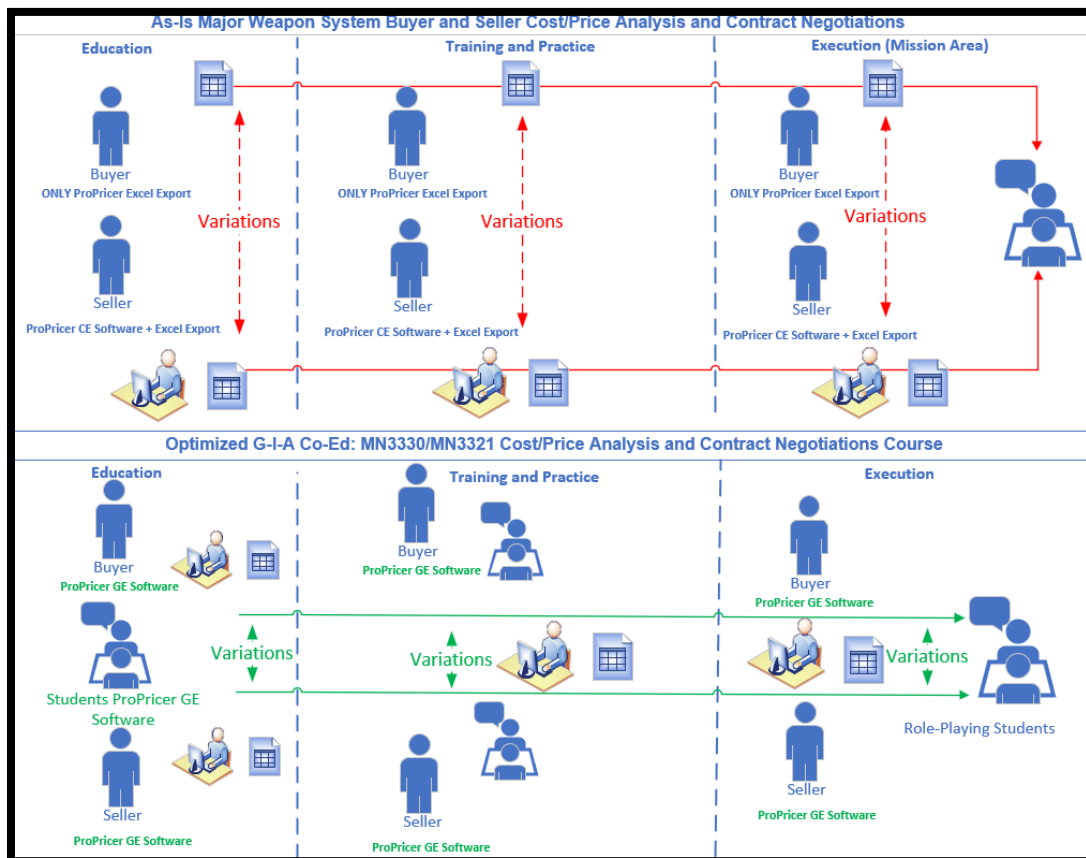


Figure 3. Optimized G-I-A Co-Ed for Cost/Price Analysis and Contract Negotiations

Variations Exist in Buyer-Seller Education, Training, and Practice

As depicted in Figure 4, the results from Statements 3 and 4 support that variations exist in buyer and seller education, training, and practice. Expressly, in Statement 3, 44% of the respondents Strongly Agreed, 11% Somewhat Agreed, and 44% Agreed that variations exist in buyer and seller education, training, and practice. For Statement 4, 50% of participants Strongly Disagreed and 11% Somewhat Disagreed that education, training, and practice variations do not negatively affect buyer and seller abilities to conduct major weapon systems cost/price and contract negotiations. These results underscore the relationship between variations in the education, training, and practice domains and the impact these variations have in the execution domain. These results are consistent with Werber et al.'s (2019) findings regarding buyers possessing insufficient knowledge of industry operations, risk management, and limited opportunities to attend joint formal education and training events influenced their understanding of requirements, cost/price analysis, and contract negotiations (p. 120). Moreover, the results are consistent with Deming's (2019) perspective on understanding interdependencies and variations (p. 93). For Drucker et al. (2015), these results also provide self-assessment results from which to consider the plan toward optimization (p. 9).

G-I-A Co-Ed: Consistent and Systematic Buyer–Seller Education, Training, and Practice

As captured in Figure 1, Statements 5 to 11 results support G-I-A Co-Ed and provide a more consistent and systematic approach in education, training, and practice for major weapon systems cost/price analysis and contract negotiations. For example, 67% of the respondents Strongly Agreed, 22% Somewhat Agreed, and 11% Agreed that G-I-A Co-Ed provides insight into buyer and seller motivations, operations, and perspectives on cost and schedule performance risks (Statement 5). When combined with the results of Statement 6, where 70% of the respondents Strongly Agreed, 11.76% Somewhat Agreed, and 17.65% Agreed that active experimentation with ProPricer GE enabled work traceability and a systematic approach to analyzing work breakdown structures, tasks, and associated basis of estimates, this supports Handfield's (2019) position on the importance of real-time analytics to support multi-stakeholder relationships (p. 195). Strong agreements across Statements 8 to 11 also support a collective understanding of major weapon system cost/price analysis and contract negotiations process for major weapon systems (i.e., beginning with Step 5 through Step 12 of Table 1).

Additional qualitative student statements support that G-I-A Co-Ed minimizes buyer–seller education, training, and practice variations. For example, participant responses such as these support a common understanding across different populations with different competency levels:

- “Incorporation of industry and external acquisition professionals provides unique insight into the challenges we face outside the classroom. The use of new and innovative contract pricing tools (ProPricer GE) was enlightening in seeing that progress can be made in efficiency and effectiveness” (participant response, number 2).
- “Interacting with ProPricer as well as industry partners was eye-opening. The process of negotiating among classmates was a great learning experience, and seeing how two groups reached different outcomes (yet still sealed the deal) highlights the complexity of issues we will face when we go back to the field” (participant response, number 10).

G-I-A Co-Ed Enhances Buyer and Seller Trust, Collaboration, and Innovation

Overall, strong agreement across Statements 12, 14, 16, 17, 18, 19, and 20 support the notion that G-I-A Co-Ed enhances buyer–seller trust, collaboration, and innovation. Respondents strongly agreed on the benefits of early participation in G-I-A Co-Ed, open and transparent data transfer, understanding buyer and seller motivations, and creating the conditions to enhance trust, collaboration, and innovation. These results are consistent with Drucker et al.'s (2015) view on the need for leaders to create the conditions for innovation, take risks, and analyze and study essential performance areas (p. 95). Handfield (2019) extended Drucker et al.'s (2015) viewpoint by underscoring the importance of sharing innovation risk and real-time analytics that enhance buyer–seller trust.

Conclusion and Recommendations

While variations in buyer and seller education, training, and practice domains exist, results from this study provided insight into the efficacy of optimized G-I-A Co-Ed for major weapon systems cost/price analysis and contract negotiation. Specifically, when buyers and sellers use near real-time analytics with ProPricer GE in the sole-source contracting process, participants with varying degrees of experience and competence benefit from concrete experiences, reflective observations, abstract conceptualizations, and active experimentation earlier in the buyer and seller professional development process. The success of delivering and transitioning major weapon systems capabilities at the speed of relevance, thus, relies on the



integrated and synchronized G-I-A interactions. These interactions, in part, facilitate the speed-to-contract award and, by extension, a major weapon systems cost/price analysis and contract negotiations cadence consistent with the needs of a dynamic 21st-century national security environment.

The study also generated three recommendations for future researchers to consider within the defense acquisition ecosystem. First, researchers should expand future cost/price analysis and contract negotiation studies to include Steps 1 to 4 of the process in Table 1: requirements planning, release draft RFP, approval program, and release RFP, respectively. Establishing a baseline of a buying organization's existing baseline for cost/price analysis and contract negotiations without ProPricer GE and then measuring the integration of ProPricer GE against the baseline might provide additional insights into G-I-A Co-Ed impacts on the corresponding personnel costs. Second, researchers should study adding more buyers and sellers from the mission area into future courses to provide a more comprehensive outcome. Third, future researchers could extend Deming's (2018) perspective on how stockholders, suppliers, employees, and customers benefit from an optimized system that includes subcontractors and suppliers who use ProPricer Contractor Education.

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