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Journal for Advancing Business Education

FROM THE EDITOR

Dear Reader,

A question that vexes the higher education community right now is the following: Will AI replace the university faculty? Artificial intelligence seems to be, more and more, disrupting various industries, including higher education. Time will tell how exactly this disruption will look like. However, artificial intelligence will definitely change the shape of the higher education workforce. If that will be in form of displacement or replacement of faculty remains to be seen. White-collar work might be more impacted than blue-collar work.

Attempts to integrate artificial intelligence into the workforce have shown that artificial intelligence alone and human intelligence alone might not be as efficient as combining the artificial and human forces to create the most productive output. That said, rather than solo-piloting the human work effort or solo-piloting the artificial intelligence work effort, a copiloting structure is called for. It will be interesting to see how much students want to acquire knowledge electronically versus knowledge delivered by an actual human.

This copiloting structure can then better help students solve difficult assignments and study materials, practice critical thinking skills, and learn industry-critical soft skills. This infrastructure will be an improved tutor or personal assistant to help students navigate the landscape of higher learning. Automation will happen in certain areas of tertiary education to the benefit of the greater higher education community. Some of these areas that will be affected are…

- Assessment
- Curriculum development
- Student tutoring
- Student campus experience
- Administration

So, why shouldn't we be worried about artificial intelligence replacing university faculty at this time? Because, at this point, artificial intelligence is not perfect. It is prone to be inaccurate, hallucinate, and provide misinformation. Therefore, artificial intelligence still needs and will still need, in the near future, a lot of human oversight. In addition, technology changes at this scale usually do not happen overnight. Furthermore, many parts of contemporary work are complex (to a certain extent), and artificial intelligence cannot sufficiently complete them. Also, many organizations are slow to adopt things, are resistant to change, or do not want to take the risk to be among the first-movers in a new area.

All in all, yes, there will be some degree of replacement of mundane teaching tasks and staff functions. However, at the end of the day, faculty members and students will have their own personal assistants that can more meticulously help them produce efficient and successful outputs. In essence, artificial intelligence will enable a personalization at the scale an assistant is needed.

And, as with everything, universities will have to adapt.

Thank you!

Christian Gilde
Managing Editor

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ASSESSING THE ALIGNMENT BETWEEN LOGISTICS EDUCATION AND THE NEED IN THE FIELD: A NECESSARY CONDITION ANALYSIS

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ABSTRACT

We explore the alignment between graduate-level logistics education and its relevancy and applicability to the need that exists across industries. We asked whether mastery of logistics related technology, knowledge of logistics course content, exposure to logistics driven hard and soft skills, and overall graduate learning - are all sufficient and necessary for meeting firms' needs across supply chains. Data were collected from 202 recent logistics and supply chain program graduates, and from 82 of their immediate supply chain certified managers. We employed Necessary Condition Analysis for testing necessity conditions amongst our variables. Findings suggest that a high level of knowledge in core logistics content and logistic related soft skills emerge as statistically significant conditions for graduates' success in the field. Identifiable hard skills being taught along with mastery of logistics technology that could help ensure successful graduates' placement in their firms were found to be statistically insignificant conditions.

INTRODUCTION

The severe global disruptions caused by the 2019 pandemic have negatively affected the world's supply chains and have increased the demand for supply chains to be able to find adequate personnel with appropriate skills and knowledge for weathering future disruptions that are likely to continue in the emerging competitive and complex environment (Austin, 2022; Joseph 2021; Van Hoek et al., 2020). Indeed, the call for the increased placement of adequately prepared graduates of logistics programs has never been greater, as they are critical for the continued globalization of commerce that has led to intensified global competition, and the rising integration of supply chains (Lebovitz 2021; Trautrims et al., 2016). These transformations imply that conventional abilities or skills are no longer adequate for new business graduates to succeed in meeting company plans and goals. Future logistics practitioners must acquire newer methods of thinking from higher educational institutions (Camps, 2017; Jordan & Bak, 2016).

While such a new mindset and logistics related skills are desperately sought, the necessity of having and developing these very skills is causing us to ask whether current academic logistics education programs sufficiently prepare practicing logisticians and their firms to adequately navigate current and future challenges? Searching for a possible answer, we embarked on studying necessary conditions between logistics-specific content, being offered in supply chain programs at an institution of higher learning, and a perceived successful field placement of logistics graduates across supply chains. We draw on the ever-expanding supply chain literature for our hypothesis development, as well as on the tenets of two theories - the knowledge-based view, and the resource-based view. Both approaches stress the critical role that essential job skills and competencies play in underscoring the strength and viability of competing organizations, especially in dynamic environments (Cooper et al., 2023; Pereira & Bamel, 2021). And as critical is how companies leverage their resources, particularly knowledge and skills of their human capital, for sustaining competitive advantage (Ivanov, 2021; Malka & Austin, 2022).

In pursuing this study, we sought to make a small contribution to the ongoing efforts in search for additional empirical support regarding the role that supply chain management education plays in reinforcing practitioners in the field, and in preparing future managers to better address logistics related needs and challenges. Gaining access to a sample of recent graduates of a leading University's supply chain program, and from graduates' immediate supervisors, we used Necessary Condition Analysis (NCA) for analysis of data and for testing of our hypotheses. Exploring possible relationships amongst our independent variables (logistics-specific knowledge, logistics-based technology, soft-and-hard logistics skills, and overall student learning) and our dependent variable (successful field placement of graduates), results have yielded meaningful information as to the nature of the fit between logistics course offerings and graduates' contribution in meeting their current firms' need.

We define successful field placement in terms of the education that logistics program graduates bring to their firms that leads to business improvements both operationally and financially as perceived by their immediate managers. And by education, we mean the relevant logistics course content that aids in framing and illuminating the role and function of supply chain management. Thus, we define logistics-specific education as the theoretical underpinnings and framework that both describe and unmask how a supply chain function and the role they play in the global economy. And we define logistic technology as those software entities as SAP, Six

Sigma, TMS, and logistics simulations, such as SCM Globe, that help graduate students first visualize then adopt solutions by simulating common logistical problems. As to the acquired skill sets, we view soft skills in terms of collaboration, negotiation, and team building that greatly aid in helping graduates be more competent in finding work among supply chain firms and adding to the competence of the firm. And we view hard skills in terms of inventory management, demand forecasting, transport management, and trade compliance.

The emerging empirical evidence helps in reinforcing logistics courses by making them more responsive and relevant and provides the impetus for developing new ones that address new developments. Findings, likewise, should help companies focus on competencies that are critical to the success of their operations, and seek graduates with knowledge and skills that are most needed. The process of 'give-and-take' between academic programs and the field must ultimately help finetune course offerings in a way that maximizes a successful placement of logistics graduates. Against this abbreviated background, our current inquiry makes specific contributions to the fields of logistics education and supply chain operations in three areas: First, from a practical point of view, we are convinced that findings can help finetune current course offerings by facilitating modifications in the way of 'upgrades' to better align logistics core courses with developments that are internal and external to supply chain companies. Furthermore, findings can lend support to and provide justification for the development of new logistics-specific content that is more responsive to the needs in the field. Modified or new, logistics education must ensure a high level of graduates' preparedness – students that are knowledgeable and well equipped for the rigors and challenges they are likely to face within supply chains. Second, from a methodological point of view, we break new ground by formulating and testing supply chain related hypotheses using NCA in the supply chain field, a field that affects all of us as consumers. Utilizing NCA as our methodology, we are convinced that results should validate this approach as appropriate and doable in future supply chain research, and thus should be replicated and further expanded. And Third, from a theoretical point of view, while seminal works identify several variables worthy of consideration in the field of supply chain, most empirical studies tended to focus on a single variable effect on an outcome. Even a scant review of the supply chain research literature would suggest that agility and resiliency have attracted more attention than any other dimension. What has been rarely done is assessing the "effects" of more than one or two logistic related variables in one study (e.g., Dubey et al., 2018). In our current effort, we include five logistics education related variables and hence potentially offering more empirically tested applicable variables for both theoretical and practical considerations. Next, we focus on two approaches that serve as a foundation upon which rests our theoretical framework – the resource-based view and the knowledge-based view.

THEORETICAL FRAMEWORK

We draw on insights from two theories that stress the value inherent in the firm's human capital's knowledge, skills and competencies, as a prime source of its unique characteristics and competitive advantage. Specifically, this study's foundation rests on the tenets of the resource-based view (RBV), and on the knowledge-based view (KBV). Both approaches stress the role that unique internal capabilities play in underscoring the continuing strength and viability of various

competing organizations, and their dependence on the skills of their employees (Barney, 1991; Pereira & Bamel, 2021).

RBV contends that while resources are often portrayed as bundles of firm knowledge (e.g., varied organizational processes, prized skills, attributes, and routines), their real value lies in their uniqueness. They are typically characterized as being rare, valuable, imperfectly imitable, and non-substitutable. Such resources can be transformed into capabilities, depending on the capacity or willingness of the firm to deploy or exercise such resources (Barney, 2012; Barney et al., 2011). From our study's perspective, access to and utilization of these unique bundles strengthens organizational interdependencies that requires supply chain members to be sufficiently integrated and collaborated if success is to be realized (Esper & Crook, 2014; Stefanovic & Stefanovic, 2009). Consequently, organizations must construct their own unique and valuable capabilities, while obtaining and sharing those attributes – skills and know-how - that the firm may lack but may find in its own supply chain (Bendoly et al., 2012). This suggests how important the role of integration, collaboration, and information sharing are when supported by proper employee training and education (Dubey et al. (2018). Thus, we contend that RBV appears highly relevant for logistics content-based capabilities that are facilitated by related education and that transform both the firm and its supply chain. One should keep in mind that empirical research points to the role of in-house resources and resource-based strategizing, expressed as working capabilities, in strengthening its position in the marketplace, and particularly its supply chain (Brandon-Jones et al., 2014; Pulles et al., 2014).

RBV has often been joined with the knowledge-based view (KBV) as a practical lens for explaining the variance in firm performance (Cooper et al., 2023; Pereira & Bamel, 2021). For one, the portfolio of an organization's resources also entails knowledge-based resources. The firm is thus conceptualized as the institution that integrates knowledge and competencies rather than merely creating them. Having knowledgeable employees means either having acquired them with useful skills, which are added to the firm's portfolio, or that know-how is taught, using the firm's resource library. If this knowledge resource meets all the RBV requirements of being valuable, rare, and hard to imitate, then it also makes possible the firm's having a sustainable competitive advantage (Pereira & Bamel, 2021). Undoubtedly, the role of formalized logistics education cannot be understated whether in the form of an acquired external knowledge or within the firm's resource library. The review of the literature that follows captures empirical evidence that is relevant for the study's variables and that leads to hypothesis development.

LITERATURE REVIEW

Logistics Education

Supply chain management as a field of study has largely emerged during the 1990s (Ellinger et al., 2012). Traditionally, logistics, subsumed into the larger supply chain management field, has represented itself as an expensive cost driver for firms, but has increasingly become a source of competitive advantage (Lin et al., 2001; Rejeb et al., 2020). Organizations found themselves having to reengineer their supply chain systems, to obtain advantage and to successfully be able to deliver the right product to the right customer at the right time (Malka &

Austin, 2023;Tang & Veelenturf, 2019). Supply chains manage, in principle, raw materials, products, information, financials, and demand (Langley et al., 2020).

Initially, supply chain curriculums were part of the industrial engineering educational programs where inventory management and production management were often the first two courses included in the program studies (Ozment & Keller, 2011). New logistics businesses, such as freight forwarding, 3PL, and entities involved with insurance, banking, customs brokerage, or a combination of them, came forth with the entrance of FedEx, UPS, and DHL into the transportation arena (Jordan & Bak, 2016; Midgley & Bak, 2022). Such developments necessitated a need for curriculums enhancement. And as logistics environments evolved, additional courses such as transportation, purchasing, warehousing and technology needed to be incorporated into the industrial engineering curriculum. In addition to these initial technology classes, new courses were also developed. For example, several Enterprise Resource Planning (ERP) systems were incorporated into programs to study medium and large firms that manage all processes in an integrated system (Gravier & Farris, 2008). Enhancing the curriculum necessitated making classes more robust to mirror academia with what is practiced in the market (Jordan & Bak, 2016). Simulation programs, technology support, practical exercises, and business cases needed to be developed for the students to enhance their hard skills and help them to make sound strategic decisions capable of accompanying them well into the field upon graduation (Prado et al., 2020).

Bartunek & Ren (2022) have recently argued that student meaning-making or sense-making goes beyond mere curriculum and largely depends on the degree to which classroom content and activities engage the self-concepts of these students in a way that can also be transferred outside the classroom. Specifically, these "academic self-concepts" describe how students know and perceive themselves in performance endeavors in the classroom, and eventually outside the formal class and onto the workplace (Bong & Skaalvik, 2003). And as critical, the ability of firms in a supply chain to find well-prepared students that can help them build superior logistics capabilities is essential for the supply chain's continued well-being and therefore needs further scrutiny (Ajilion, 2021). There has been a recent recognition that the talent needed to keep supply chains functioning well may be lagging (Gravier, 2022; Joseph, 2021). As Fawcett and Rutner (2014) have long argued, universities are faced with divergent claimants - academics versus logistics practitioners - where a common ground must be found relative to relevant content and skills that can be researched and taught. And ultimately, a common ground where both students and logistics employers are satisfied. We can then hypothesize that,

H1: A higher level of logistics content knowledge (X1) is necessary for a higher level of successful field placement of graduates (Y).

Use of SCM Technologies

Practitioners are more interested in what constitutes the content of supply chain courses rather than with much of the research being offered by academics (Fawcett & Waller, 2011). Put differently, they are most interested in resources that can help them solve their current market problems. Technology-specific content appears to be well aligned with the field. Consider, for instance, a recent analysis that has predicted that e-commerce will continue to grow exponentially, thus requiring about 28,500 new warehouses to be constructed globally by

2025. CBRE, a real estate firm, likewise predicts a need for purchasing of some 330 million square feet of additional D.C. space by 2025 (Michel, 2022). With such development planned, the use of simulations and other technologies becomes critical as it allows for modeling, or virtualizations, of processes to be built. Such modeling establishes how systems may be configured, and importantly, how they will react to swings in demand in real-world applications. These technologies give students practical experience with the same tools being used in the market by firms conducting warehouse automation and various supply chain management activities (Bak & Boulocher-Passet, 2013).

Research by Fish (2007), Piercy et al. (2012), and Scholten and Dubois (2017) showed that student hands-on learning, having such concrete experiences with content, helped ensure improved learning and the adoption of lifelong learning skills. Similarly, Swaim et al. (2022) found the use of simulations and applied projects strongly supported the active learning by students. Finally, Kageyama et al. (2022) confirmed that simulations, possessing such features as strong design, interactivity and induced realism, helped create higher order thinking skills among graduates that enabled more critical analysis and reflection. For Holweg & Bicheno (2002), simulations are powerful tools to gain insights into one's own network, thus they provide the student with experiences with real-world scenarios, but also permit them to impose holistic solutions that businesses do not always allow, given their focus on pursuing their own strategies. Ultimately, the use of SCM appears to work well for both students in the classroom and managers in the field. For supply chain managers, it is clear that more complex tools, including discrete event simulation (DES) that assists in examining decision options, as well as tools for integrated strategy across diverse business divisions – are all necessary for validating performance indicators in warehouse operations as part of adapting to Industry 4.0 (Agalianos et al., 2020). And in the classroom, as suggested by empirical evidence, modeling realistic supply chain scenarios enhanced students' ability to solve inventory management issues, forecast demand, and manage vehicle routing and scheduling. These are problems that classroom teaching alone could not have explained adequately (Sun & Song, 2018). We can then hypothesize that,

H2: A higher level of logistics technology related knowledge (X2) is necessary for a higher level of successful field placement of graduates (Y).

Necessary Logistics Skills

A hotly debated topic within the supply chain field and academic circles concerns the specific skills that universities can help develop and that are of prime value to the field. Some call for graduates to be educated and trained in synthesizing information, critically analyze its implication, and seriously reflect on possible solutions, to better manage what has become an intensely global and competitive landscape (Li, 2020). Gordon and Cheah (2019) developed a set of skills in the three categories (business, logistics, and management), concluding that for senior-level positions, they are in order of managers first and logisticians second. Jordan and Bak (2016) have suggested that business schools miss the mark in terms of staying current and in minimizing the use of lagging textbooks. This suggests that skills need to be better identified and defined as either hard skills (inventory, transportation, finance, technology, and heuristic models) or soft skills (contract negotiation, relationships, and

leadership). There are also a number of professional organizations e.g., the Association of Supply Chain Management (ASCM), the Institute for Supply Management (ISM), the Council of Supply Chain Management Professionals (CSCMP), and the Chartered Institute of Logistics and Transport (CILT) that survey their members seeking to both educate and certify members with what they view as marketable skills. For example, ASCM (2022), has recently surveyed their global members and found skills and competencies, similar to what Sinha, Millhiser, and He (2016), who examined job descriptions on LinkedIn, have reported. In both instances, the conclusion has been that employers sought both soft skills and supply chain IT skills, which needed to be deeply embedded in graduate curriculums if they were to stay relevant. Other findings support this trend. Mangan and Christopher (2005) found hard skills such as finance, operations, and trade needed to be paired with more personal (soft) skills such as interpersonal relations and leadership. Sun and Song (2018) followed in like manner concluding that a study of journals they reviewed suggested hard skills (professional knowledge, quantitative modeling, sourcing management, warehouse design, business management i.e., risk analysis, quality control, negotiations), and communication, teamwork, and soft skills (i.e., flexibility, leadership, time management) were essential for acquiring the ability to navigate the global marketplace. Lastly, Tatham et al., (2017) showed agreement by reporting in their Australian study that few functional or hard logistics skills made their list of significant skills, although they too emphasized general soft skills - such as problem solving and relational capabilities as critical. They stressed also that supply chains are fundamentally networks of relationships, and hence educational institutions must blend or integrate their hard and soft skills to ensure that students understand how supply chains are gravitating toward increasing integration and coordination amongst their members.

Finally, as MacIntosh et al. (2017) have found, business schools that inculcate their students with such skills see them become managers that resort to these concepts and tools that they have absorbed and find that they apply them to their managerial roles. Relevant skills and content matter significantly, such that they have a positive effect on student engagement (Finney & Pike, 2008). Group projects remain a key means of improving teamwork skills or competencies, which are essential in logistics (Wrobel-Lachowska et al., 2019). From the above discussion, we can then hypothesize that,

H3: A higher level of acquired soft logistics skills (X3) is necessary for a higher level of successful field placement of graduates (Y).
H4: A higher level of acquired hard logistics skills (X4) is necessary for a higher level of successful field placement of graduates (Y).

Overall Student Learning

As alluded to in our introduction and the preceding pages, work in today's supply chain field is remarkably intense and evolves operating in a competitive environment that requires participants to have strong educational background and learned skills. Being able to think critically in various situations, analyze different available options, and synthesize on-hand data for crafting solutions, while working within and across groups of individuals, are all critical as are the specific hard tools of finance, IT, and warehousing that are currently found in the industry (Al-Shammari, 2022; Wrobel-Lachowska et al., 2019), thus the combined learning experience of a typical supply

chain graduate is both an integrative and skills-oriented endeavor. Both should be aligned, and so should the academic and the student learning experience. And as critical, to achieve meaningful student engagement, university faculty and professional instructors must move away from their traditional roles as simply knowledge experts toward more essential roles as facilitators of learning (Scholten & Dubois, 2017). This process entails students taking more responsibility for their own learning through reflection and practice. And they must also be involved in contextually rich activities, such as writing, analyzing, and participating in integrative class exercises (Pekkanen et al., 2020). In an illustrative way, we perceive the overall student learning and experience to be a bridge that connects logistics content, knowledge and skill to the field and the real world. We can then hypothesize that,

H5: A higher level of overall student successful learning (X5) is necessary for a higher level of field placement of graduates (Y).

NECESSARY CONDITION ANALYSIS (NCA)

Nec**e**ssary conditions can be analyzed using NCA, a novel analysis technique (Dul, 2020). This methodological approach differs from conventional correlational methods, such as regression, and structural equation modelling. NCA does not focus on average trends of multiple predictors; instead, NCA identifies single necessary causes. In other words, rather than explore probabilistic relationship amongst variables, NCA allows us to study variables that are necessary for a certain outcome. In our case, we seek to determine whether logistics education content is necessary and relevant in supporting supply chains operations. It is important to stress that NCA does not compete with traditional analysis techniques, but rather it complements them. NCA's main functions are to draw scatter plots with ceiling lines, calculate NCA parameters - ceiling zone, scope, and effect size, perform approximate permutations (typically, 10,000) to test for statistical significance, and calculate bottleneck tables. Findings concerning the entire set of NCA functions as they relate to our data analysis appear in our results section.

A brief explanation of each function is essential for the reader who is not familiar with NCA. A key function is the scatter plot; rather than draw a regression line through data in a scatter plot, NCA looks for empty spaces in the upper left-hand corner of the plot and draws a ceiling line "on top" of the data. Lines serve as a border between the 'empty space' and the 'full space' of the dataset (Dul, 2020). In our case (see Figure 1), lines indicate the degree to which successful field placement (y-axis) could be ensured without the presence of logistics knowledge, technology and skills factors, and overall graduate's learning (x-axis). In other words, the ceiling line marks the boundary between the zone with and without observations. The larger the empty zone, called the ceiling zone (C), the larger the constraint that the condition (e.g., mastery of logistics related technology) puts on the outcome (i.e. successful field placement). Thus, the size of the ceiling zone compared with the size of the entire area that can have observations (i.e. the scope, or S) represents the *effect size* of a necessary condition. The effect size is expressed as d = C/S with d being the effect size. The range of d can be from 0 to 1 ($0 \leq d \leq 1$). Dul (2020) suggests the following thresholds: $0 < d < 0.1$ is considered a small effect, $0.1 \leq d < 0.3$ is considered a medium effect, and $0.3 \leq d < 0.5$ is considered a large effect, and $d \geq 0.5$ is considered a very large effect. Thus, the effect size of $d = 0.1$ has been used as a threshold to consider an effect as theoretically

and practically meaningful (Dul, 2020). To ensure that the effect size is not the result of a random chance, NCA requires and allows the researcher to perform approximate permutations, typically about 10,000, to test for statistical significance (Dul, 2020). Assessing the effect size and its statistical significance thresholds permits the researcher to conclude that there is a meaningful necessary condition; namely, when the effect size *d* is larger than 0.01, and is statistically significant with a *p*-Value equal to or smaller than 0.05.

An additional comment relative to ceiling lines is warranted. NCA presents two recommended ceiling lines: ceiling envelope (CE) and ceiling regression (CR). The CE technique – a ceiling envelopment with free disposal hull (CE-FDH) - assumes that the ceiling is non-decreasing, resulting in a non-decreasing step function (see Figure 1 under results section). CR 'smooths' the linear function obtained by the CE technique, and thus CR- FDH draws a line through the CE-FDH corners (see Figure 1). According to Dul (2020), given that the CE-FDH is more flexible and does not require many assumptions, it is the recommended ceiling technique for dichotomous and discrete necessary conditions. CR-FDH is recommended for continuous necessary conditions. Finally, interpreting NCA results can be facilitated using *bottleneck tables*, which are particularly helpful when one wants to analyze multiple necessary conditions for the same outcome; in our case, assessing the necessary conditions of logistics knowledge, skills and related technology for successful field placement of graduates. A bottleneck table is a tabular representation of the ceiling line of our multiple NCA's necessary conditions. It indicates which level of a necessary condition is needed for a certain level of the outcome, according to the ceiling line. Table 5 (see results section) shows a bottleneck table. The outcome levels are expressed as a percentage of the observed range: 0 is the minimum observed value, and 100 the maximum observed value. The condition levels are also expressed as a percentage range, thus suggesting which high levels of Y can only be achieved with a certain level of X. Unless these minimum levels of X are achieved, the various levels of the outcome will not occur. While NCA application has been used in various studies conducted in different fields, such as in HRM, education, psychology, entrepreneurship, tourism, and international business management (e.g., Tynan et al., 2020; Wangoo & Jeong, 2021), and with the exception of a few works that employed NCA in studying lean practices in manufacturing (Knol et al., 2018), and in supply chains (Malka & Austin, 2022), no other study has used NCA in the field of logistics and supply chain management strategy. We turn next to the methodology utilized with a focus on our sample, measures and the procedures being used.

METHODS

We intend on investigating the 'fit' that exists between core supply chain courses, student learning, and company needs in various supply chains. We hope to find answers to a few questions – Do logistics core courses sufficiently address the needs in the field? How well have graduates' academic learning and experiences prepared them for meeting work demands? How do graduates rate the relevancy of program courses to their company's operations? How do immediate supervisors rate graduates' preparedness for meeting job and company needs?

Sample - Our sample is drawn from the universe of recent graduates of a southeastern university supply chain program totaling about 300 graduates. Included in our sample are

participants that have graduated within the last five (5) years - between 2018 and 2022 - and have been employed in supply-chains across industries. In addition, included in our sample are immediate supervisors of the graduates. To be included in the sample, supervisors must be certified supply chain professionals. Our preliminary estimate suggests that the total number of possible participants is about 400. G*Power calculation suggested that a sample size half that estimate (N=200) is sufficient for conducting required data analysis using NCA. With the approval of our study by the university's IRB, we began with data collection and ceased soliciting additional surveys once we reached 202 completed surveys by program graduates. In addition, 82 immediate supervisors of our responding graduates accessed and completed a manager designated survey via a separate link. We captured some of our graduates' demographics in Table 1 below.

Measures and sample items - We intend on assessing graduates' subjective rating of logistics programs' relevancy to their current work in supply chains, as well as assessing their immediate supervisors' ***objective*** rating of graduates' knowledge applicability to the field and their readiness for work. The study's survey, a multiitem questionnaire with a Likert 7-point scale, developed and validated by the authors, is comprised of 16 statements concerning four areas of logistics-specific course work: Logistics-specific knowledge, logistics related technology, soft and hard skills acquired during academic study. These four areas (X_1-X_4), along with overall student learning that is measured by their GPA (X_5), represent the study's independent variables (X_1 through X_5). In addition, our survey includes five statements about successful field placement of graduates in supply chains, the study's dependent variable (Y). For X_1-X_4, the aim is to solicit the degree of *subjective* agreement from *graduates*, on a seven-point Likert scale, ranging from "Strongly Disagree" (1-point) to "Strongly Agree" (7-points) with respect to each statement, and as it applies to graduates' current line of work. For our Y, the aim is to solicit an ***objective*** agreement from graduates' immediate *managers* to statements concerning the level of logistics knowledge applicability and graduates' preparedness, as it relates to supply chain companies' needs and operations. The managers' survey, a 5-item questionnaire, rate responses using the same Likert 7-point scale, ranging from "Strongly Disagree" (1-point) to "Strongly Agree" (7-points). Thus, the proposed data collection design follows this logic: Our five independent variables are subjectively measured and rated by the graduates themselves. And, to negate the risk of a possible rater-self bias when measuring our dependent variable (successful field placement), we intend on adding the objective ratings of the graduates' immediate supervisors.

Table 1: Sample Characteristics

Gender		Program		Time at Current Firm	
Male	106	Online	102	0 -1 Years	52
Female	92	In-person	99	1 -2 Years	47
Undisclosed	3			>2 Years	33
				>3 Years	69
Age Group		Current Role			
< 25	20	Management	87		
26 -35	89	Analyst	16		
36 -45	49	Logistics	52		
46 - 55	26	Other	46		
> 55	17				

(N = 202)

A sample of logistics-specific content area items include – 1. I have acquired sufficient logistics knowledge that helps me successfully address logistics related challenges at my workplace; 2. My cross-functional logistic-specific knowledge has equipped me with relevant skills that are essential to my firm. Graduates rate these items, and all other items on a seven-point Likert ranging from "Strongly Disagree" (1-point) to "Strongly Agree" (7-points). As mentioned earlier, supervisors are asked to complete a separate questionnaire with five statements regarding relevancy of graduates' logistics knowledge to the field, its applicability to their current line of work, and their academic preparedness for meeting company needs and operations. Sample statement items, to name a few, include – 1. The university's graduate logistics program equipped my employees with appropriate logistics-specific technologies that are essential for our firm's operations (Likert Scale 1–7), and – 2. The university's logistics program equipped my employees with appropriate logistics-specific hard skills (e.g., best practices knowledge, inventory management, and project management) making them valuable to our firm (Likert Scale 1–7).

Procedure - The entire universe of recent program graduates, during the preceding five years (2018-2022) – has been targeted via direct email. Graduates' names and email addresses were obtained via the university's Marketing Office. An online opt-in invite to take part in the early study was posted to members of our sample and their immediate supervisors, with an explanation as to the purpose of the study, as well as to the researchers' ensured anonymity and expressed interest in aggregate data only. Members who choose to participate gained access to the survey via a designated link to a Qualtrics-based questionnaire, as the means used to collect the data. The names and email address of the graduates' supervisors were obtained from participating graduates themselves, and once verified – were invited to take part in our research effort. And like the graduates, supervisors were assured of our commitment to confidentiality and interest in aggregate data only. Thus, within the context of the study's focal unit and theoretical domain,

logistics program graduates (within the last five years) and their experienced and certified supply chain managers - serve as our data informants. G*Power software established a sufficient sample size of n = 200, and thus we ceased solicitation once a threshold of n = 202 was reached. In our current context, we seek to use NCA to study the effects of said variables from a fresh angle, hence hoping to shed new light on the necessity conditions as stated in the above formulated necessary hypotheses. Since NCA is fundamentally a bivariate analysis method, only one X and Y are analyzed at a time. We intend on using the scatter plot approach, and given the nature of our data, we intend on showing both NCA default lines (s) - the step line CE-FDH in case data around the ceiling is irregular, and the line ceiling regression CR-FDH given the continuous nature of our data. The plots are expected to show no cases in the empty cell at the top left corner of each plot, thus validating our assertion of necessary conditions as hypothesized. We set the effect size (d) threshold at a level that is less than or equal to 0.5. Namely, small to medium effect size (Dul, 2020). In addition, we set a statistical significance p-Value at less than or equal to 0.05, for the effect size with 10,000 permutations; this allows us to gain accurate p-Value estimates as recommended (Dul, 2020). Finally, we intend on calculating bottlenecks and presenting results in a bottleneck table**.**

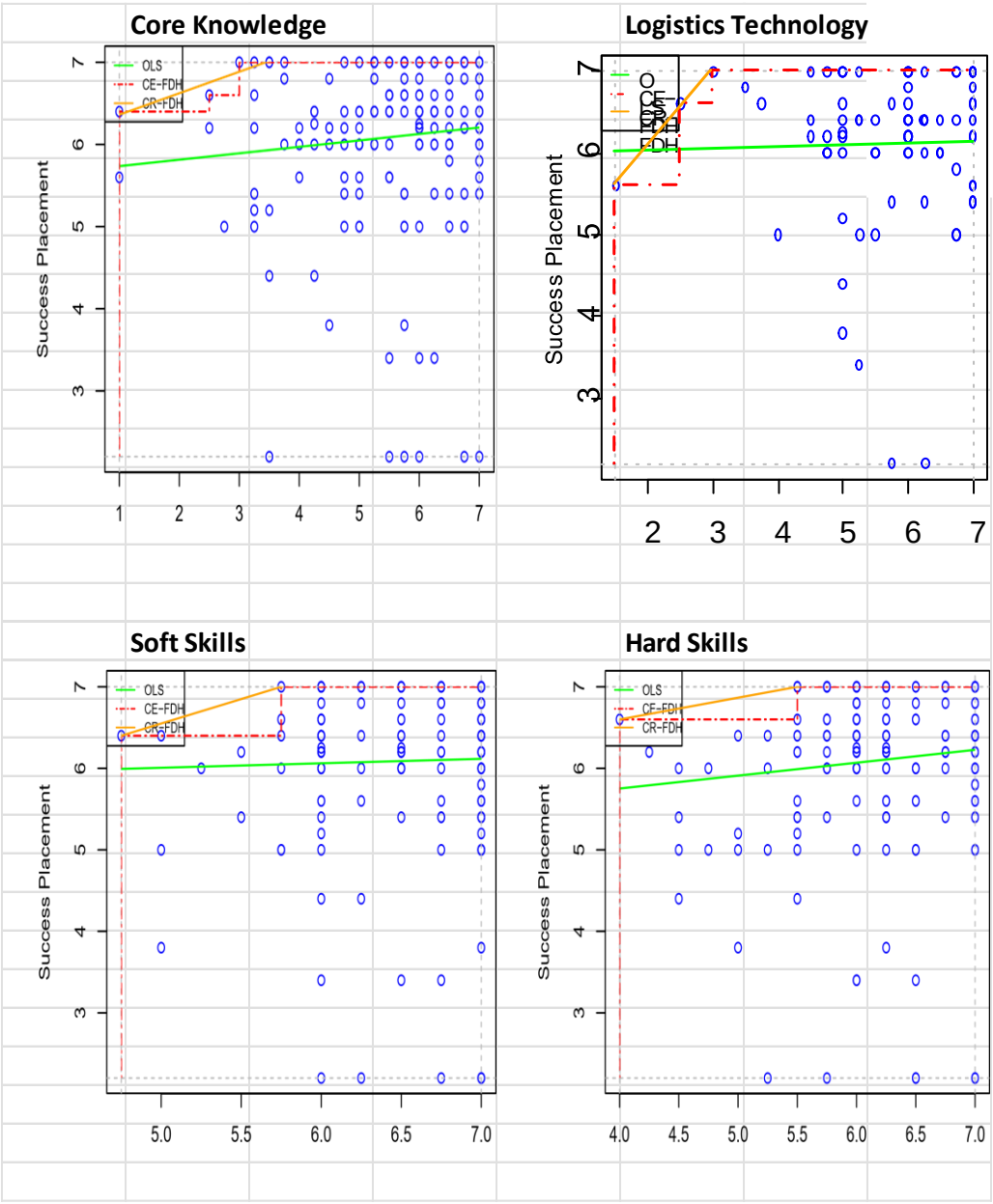
In the section that follows we present the study's results as depicted in relevant scatter plots, as well as in several tables that captures key quantified parameters, P-values, and bottlenecks.

RESULTS

Table 2: NCA Quantified Parameters

	Logistics Knowledge	Mastery of Technology	Acquired Soft Skills	Acquired Hard Skills	GPA
	cr_fdh	cr_fdh	cr_fdh	cr_fdh	cr_fdh
Ceiling zone	1.9279	1.018	1.031	0.3	0
Effect size	0.216	0.039	0.107	0.021	0
c-accuracy	98.50%	99.50%	94%	100.00%	100.00%
Fit	70.80%	63.60%	63%	50.00%	0.00%
Slope	0.262	0.943	1.969	0.267	0
Intercept	6.1	4.2	-4.862	5.533	0
Abs. ineff.	9.241	24.363	7.537	13.8	0
Rel. ineff.	84.588	92.286	78.514	95.833	0
Condition ineff.	59.314	73.278	48.828	50	0
Outcome ineff.	86.699	71.131	58.013	91.667	0

Figure 1: Scatter Plots

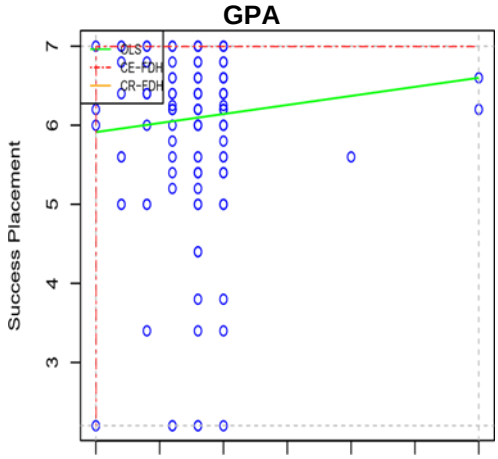


Results in Table 2 represent parameters of our five (5) X-variables relative to Y – successful field placement. For parsimonious reasons we did not include scope and min/max values of our variables. Interpretation of key parameters requires an understanding of what they represent: C-accuracy refers to the extent to which cases are on or below the ceiling line expressed as a percentage of all cases. The Fit score is the effect size of a selected ceiling line divided by the effect size of the CE-FDH ceiling line. For CE-FDH the Fit is 100%. Slope and Intercept are only relevant for CR-FDH given that it is a straight regression ceiling line. The necessity inefficiency

parameters indicate: (1) the area of the scope where X does not constrain Y (Condition inefficiency); (2) the area of the scope where Y is not constrained by X (Outcome inefficiency); (3) the total unconstrained area (absolute inefficiency); (4) and this area as a percentage of the scope (Relative inefficiency). For the purpose and scope of this paper we only discuss the effect size results as they are the core parameter of the NCA method. Effect size values represents the *substantive significance* of the necessity effect of X and Y. In our case, as depicted in Table 2, except for GPA, the values of four (4) effect sizes are far below the threshold value of 0.5 but greater than 0.01. Thus, these results are perceived as small sizes and hence are deemed meaningful (Dul, 2020).

Figure 1 depicts plots of our five (5) independent variables relative to a successful field placement of graduates in our sample. A visual inspection of each one of our five scatter plots points to the existence of an empty space in the upper left corner of four out of five plots. The relatively small size of the empty space for each one of these plots suggests a relatively small constraint of $X_{1\text{-}4}$ on our dependent variable (Y). Notice that no empty space exist for GPA (X_5), see plot below (Figure 2).

Figure 2: Scatter Plots



The lack of constraint in this case also points to lack of necessity, or relevancy of GPA to a successful field placement. Also noticeable is the fact that there are no cases above the CE-FDH red-dotted line, and that only a negligent number of cases are visible above the CR-FDH yellow line. Thus, suggesting a high level of X is necessary for a high level of Y as envisioned by NCA. Using both ceiling lines with our plots supports the robustness of our analysis since it allows for the comparison of results. However, given space constraints here, and given the continuous nature of our data, we only present CR-FDH results as depicted in Table 2, the NCA quantified parameters.

Table 3 presents the statistical significance test – *p*-Value for the variables' effect size, in addition to other data values. Consider that we set a threshold of 0.05 for the *p*-Value. The *p*-Value test, with 10,000 permutations, suggests that while the *p*-Value of the effect size of logistics core knowledge, and logistics related soft skills is below the set threshold of $p = 0.05$, and thus considered statistically significant, the corresponding *p*-Value of the effect sizes of logistics related technology and hard skills, as well as GPA, is above the set threshold of $p = 0.05$. At 0.169, 0.283,

and 1.000, respectively, their effect size is insignificant. In NCA terms, whereas the observed effect sizes for core knowledge and soft skills are likely not caused by random chance of unrelated variables, the observed effect sizes for logistics technology, hard skills, and overall GPA could be due to random chance of unrelated variables.

Table 3: Key NCA Parameters and *p*-Value Test

	Core - Knowledge	Mastery of Technology	Acquired Soft Skills	Acquired Hard Skills	GPA
Ceiling Zone (c)	1.9279	1.018	1.031	0.3	0
Scope (s)	28.8	26.4	9.6	14.4	3.8
Effect size (d)	0.216	0.039	0.107	0.021	0
C-accuracy	98.50%	99.50%	94%	100.00%	100.00%
p-Value	0.049	0.169	0.006	0.283	1

Table 4 captures the essence of our findings in a summary table that allows for the formulation of a conclusion as we discuss next. Overall, our results suggest that except for Overall Student Learning, as measured by their GPA score, four (4) of the study's hypotheses are *theoretically* supported; the effect size of each of the four (4) hypotheses is less than 0.5 threshold, but larger than 0.000. Yet, the *p*-Value of only two variables – logistics Core Knowledge, and logistics related Soft Skills - is less than 0.05. And since NCA requires that all three (3) criteria must be met for supporting a hypothesis, only Core Knowledge and related Soft Skills could be considered as necessary conditions.

Table 4: Summary of Findings

	Theoretical Support?	d < 0.5?	*p* < 0.05?
Knowledge	Yes	Yes	Yes
Technology	Yes	Yes	NO
Soft Skills	Yes	Yes	Yes
Hard Skills	Yes	Yes	NO
GPA	Yes	Yes	NO

Their *substantive significance* (d < 0.5) and their *statistical significance* ($p < 0.05$) are strong enough to not falsify their necessary condition hypothesis, respectively. Hypothesis H1, formulated *in kind*, is *A higher level of logistics technology related knowledge (X_1) is necessary for a higher level of successful field placement of graduates (Y),* and hypothesis H3, formulated *in kind*, is *A higher level of acquired soft logistics skills (X3) is necessary for a higher level of successful field placement of graduates (Y).*

The bottleneck table, see Table 5 next, depicts what level of X is required for a given level of Y, and thus allows for hypothesis formulation *in degree*. Table 5 provides practical insight concerning the required level of the necessary conditions for a certain level of Y.

Table 5. Bottlenecks

Y	1	2	3	4	5
Placement	Knowledge	Technology	Soft	Hard	GPA
0	NN	NN	NN	NN	NN
10	NN	NN	NN	NN	NN
20	NN	NN	NN	NN	NN
30	NN	NN	NN	NN	NN
40	NN	NN	NN	NN	NN
50	NN	NN	NN	NN	NN
60	NN	NN	NN	NN	NN
70	NN	NN	NN	NN	NN
80	NN	8.2	NN	NN	NN
90	10.1	17.5	NN	8.9	NN
100	40.7	26.7	50	44.4	NN

The values for the variables in Table 5 are expressed in percentages. The outcome level of a desired successful field placement must be above 80 percent to 'kick in', representing a high necessity level to overcome a level of 'no need' (NN) for most independent variables as a condition for achieving that outcome level. Results in Table 5 suggest that for a level of field placement that is ≥ 90 percent, three out of five (5) conditions must exist in varying levels that grow with an increase in successful placement levels. However, note the negligible (NN) level of GPA condition, as a measure for overall student learning, that is necessary for increasing levels of placement success when compared with other conditions in our study. Consider that at 100 percent of successful placement, the level of logistics related soft skills, hard skills, logistics core knowledge, and logistics related technology, as necessary conditions, must stand at 50 percent, 44.4 percent, 40.7 percent, and 26.7 percent, respectively. This finding is certainly well aligned with the results in previous tables regarding soft skills and core knowledge, but also highlights the importance of hard skills and mastery of logistics related technology. The inherent practical implication suggests an opportunity for managers to zoom in on critical factors and on their degree of necessity for the improvement and enhancement of graduates' successful field placement. In our sample of logistics program graduates and their supply chain managers, capitalizing on knowledge and on related soft skills, may not be sufficient and must be complemented by further nurturing graduates' hard skills and familiarity with the firm's unique technologies. These emerge as priorities for in-house training and coaching. Hard skills and mastery of the firm's technology constitute two competitive priorities that supply chain managers in logistics-based industry cannot

ignore. We conclude our study with a discussion and interpretation of results, and touch briefly on a few practical implications and recommendations.

DISCUSSION

This study makes a small contribution to the field of logistics and supply chain education. Drawing on theory and previous empirical findings, and employing necessary condition analysis, we sought to establish necessary conditions amongst logistics education and a successful field placement of graduates across supply chains. More specifically, we asked whether a possible 'fit' exists between logistics course content and its perceived value and relevance for graduates' daily work activities, and for their current companies. As such, we searched for answers to a few questions – Do logistics core courses sufficiently address the needs in the field? How well have graduates' academic learning and experiences prepared them for meeting future work demands? How do graduates rate the relevancy of program courses for their company's operations? How do immediate supervisors rate graduates' preparedness for meeting job requirements and organizational needs?

Our findings appear to portray a mixed picture. While empirical support for two study hypotheses (H_1 and H_3) is reported, no support has emerged for our other hypotheses (H_2, H_4, and H_5). Specifically, logistics core knowledge and logistics related soft skills appear to be significant and necessary for graduates' successful field placement ($p < .006$, and $p < .049$, respectively), and thus are meaningful conditions for promising job placement. We can generally conclude that graduates and their immediate supervisors consider the logistics education they acquired to be of help in their daily work activities, and of value to their firms' bottom line. Content of core classes and logistics related soft skills appear to be significant determinants of promising field placement of graduates in their current supply chain firms. Course developers must stay the course and remain focused on the most relevant logistics content to ensure minimizing potential future diversion of stakeholders' views, be it from the academia or the field, as they relate to core courses and soft skills. In a word, keep doing what has been done in the logistics program, and do it better. However, statistically insignificant are the mastery of related technology and graduates' hard skills. They emerged as irrelevant conditions for successful job placement. Likewise, overall student learning, as measured by graduates' GPA, appears to be an unnecessary condition that plays no role as a predictor of successful job placement. Our message to logistics course developers is to revisit both hard skills and technology related courses and explore conditions that can help make both these areas more applicable and relevant to the field. Seeking further feedback from supply chain managers is warranted.

We interpret the results concerning logistics knowledge and acquired soft skills as being well aligned with the approaches mentioned in our theoretical framework. Merging the two approaches - Barney's RBV (1991) and KBV, the knowledge-based view (Pereira & Bamel, 2021) - offers a richer perspective on competitive advantage as it relates to the firm's human capital in terms of core knowledge and competencies. Having knowledgeable employees means having acquired them with useful skills, which are added to and enrich the firm's knowledge library and portfolio, or that know-how is taught using the firm's resource library. If knowledge as a unique resource meets all the RBV requirements of being valuable, rare, unsubstituted, and hard to imitate, then it also makes it possible for the firm to enjoy a state of sustainable competitive advantage.

We contend that the role of formalized logistics education cannot be understated whether in the form of an acquired academic knowledge or within the firm's unique and heterogeneous resource library. Still, unlike academic knowledge, technology is widely available and can be purchased in the marketplace, thus possibly depriving the firm of a competitive advantage. Can this logic explain why logistics related technology emerged as a weak condition? Similarly, it is possible to assume that logistics related hard skills are perceived as overlapping or complementary to knowledge-based course offerings? If so, they may be lacking sufficient differentiation, or may be seen less as an 'independent' standing area by graduates and managers alike. This logic may not apply to soft skills that emerged as statistically significant condition. Researchers have noted the paucity of functional hard skills as not being useful for dealing with these turbulent times and argued for more softer skills such as problem solving and collaboration (Mangan & Christoper, 2005; Tatham et al. 2017). Similar findings support this assertion. For example, the Association of Supply Chain Management (ASCM) has recently surveyed their global members about skills and competencies that employers sought. Soft skills and supply chain IT skills emerge as critical, thus appearing to suggest that soft skills are needed to be deeply embedded in graduate level curriculums if they were to stay relevant. ASCM (2022) survey results, as they relate to soft skills, can be seen in the table below.

Table 6: ASCM Global Member Survey (Soft Skills)

Soft skills				
51% (1779) Collaboration	41% (1431) Critical Thinking	30% (1047) Big-picture planning	28% (977) Troubleshooting and problem-solving	24% (837) Time management

Source: ASCM, 2023

Other works point to the need for paring up hard skills with more personal soft skills (e.g. Mangan & Christopher, 2005; Sun & Song, 2018). The need rests on the belief that supply chains are fundamentally networks of relationships, and hence educational institutions must blend or integrate their course offerings with soft skills to ensure that students understand how supply chains are gravitating toward increasing collaboration, planning, and problem solving amongst their members (Bak & Boulocher-Passet, 2013). And yet, as we stated earlier, the finding relative to hard skills and related technology should not be ignored. It necessitates revisiting relevant classes and sorting through the library of skills taught and practiced in the classroom and beyond. It calls for the narrowing of current offerings down to the most vital set. That ought to be covered with more intensity in terms of content and time. Soliciting further feedback from graduates and the field is a continuous task worth taking. And as relevant for the field, managers should consider the NCA related bottlenecks analysis, see Table 5 above, that depicts what level of X is required for a given level of Y. As such, the table provides practical insight concerning the required level of the necessary conditions for a certain level of Y. This of course allows for zooming in on critical gaps and deficiencies, primarily for training purposes, and on their degree of necessity for the improvement and enhancement of graduates' 'fit' in their places of work, as well as for their firms' operations.

Our inquiry makes specific contributions to the fields of logistics education and supply chain operations in three areas: First, from a practical point of view, we are convinced that findings can help finetune current course offerings by facilitating modifications in the way of 'upgrades' to better align logistics core courses with developments that are internal and external to supply chain companies. Furthermore, findings can lend support to and provide justification for the development of new logistics-specific content that is more responsive to the needs in the field. Modified or new, logistics education must ensure a high level of graduates' preparedness – students that are knowledgeable and well equipped for the rigors and challenges they are likely to face in supply chains. Second, from a methodological point of view, we break new ground by formulating and testing supply chain related hypotheses using NCA in the supply chain field, a field that affects all of us as consumers. Utilizing NCA as our methodology, we are convinced that results should validate this approach as appropriate and doable in future supply chain research, and thus should be replicated and further expanded. Third, from a theoretical point of view, while seminal works identify several variables worthy of consideration in the field of supply chain, most empirical studies tended to focus on a single variable's effect on an outcome. Even a scant review of the supply chain research literature would suggest that agility and resiliency have attracted more attention than any other dimension. What has been rarely done is assessing the "effects" of more than one or two logistic related variables in one study (e.g., Dubey et al., 2018). In our current effort, we included five logistics education related variables and hence offer more empirically tested applicable variables for both theoretical and practical considerations.

In closing, it appears that despite the study's mixed results, we can generally conclude that graduates and their immediate supervisors consider the logistics education they acquired to be of help in their daily work activities, and of value to their firms' bottom line. Yet, we should keep in mind that successful field placement is likely to be affected by many other unaccounted-for factors given the complex and dynamic realities of today's workplace. Thus, the difficulty of determining a link to an outcome may be affected by many other factors. We encourage future research that further explores additional classroom-field related links. Such research ought to consider both casual indeterminacy and construct redundancy to overcome potential limitations found in this study.

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UNIVERSITY-COMMUNITY PARTNERSHIPS TO BUILD THE NEXTGENERATION OF INNOVATORS

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ABSTRACT

Many educators and community leaders have the goal of developing the next generation of innovators who will tackle the world's complex challenges, but how does a community come together to form meaningful partnerships to support the next generation of innovators to work on local complex community challenges? This article presents the journey of how a community and its university partnered to develop a community-supported design-thinking innovation clinic. The project's goal was to provide students with the tools needed to ideate creative solutions to community-relevant challenges, thereby training the next generation of problem solvers in their own backyard. Included are the project's strategic planning phase, the program's design, and the outcomes of this successful program entitled, Ready, Set, Innovate!

INTRODUCTION

How can a university-community partnership support student innovation while creating benefits for the community? This was the question that a group of stakeholders from a rural community and its local public university addressed. Together, the partners designed and developed a successful innovation clinic model aimed at high school and early career college students to address complex community challenges. This program was created to serve as the first of many innovation and entrepreneurship experiences at the university, all of which purposely connect the university and the surrounding community.

This article presents the process used by university-community partners to develop an innovation event for students focused on community challenges. Along with a background, the article will present an overview of the program, stakeholder roles, pedagogy, and materials utilized. In addition, the student outcomes of the event are reviewed along with stakeholder feedback. This is followed by a summary of key insights from the program, such as how it strengthened the student-university-community connection.

BACKGROUND

University-community partnerships have long been studied for their benefits and complexities. Along with their economic contributions, many studies contend that universities should establish community partnerships instituted for mutual benefit while also producing valuable learning opportunities for students (Mbah, 2019; Breznitz & Feldman, 2010; Pugh et al., 2016). However, there are often competing priorities among community members and a university, making it complicated to listen to each other and share expertise toward attaining a common goal (Mhab, 2019; Breznitz & Feldman, 2010). Despite the challenges, many models have been developed to support university-community partnerships for mutual benefit. For example, Dewar and Isaac (1998) recognized the value of adopting a community-driven planning model to support university-community relationships. This model assumes that the university and community share similar goals for social improvement and that complementary relationships exist where everyone is a participant, and no one is a leader.

Strategic Doing™ Framework furthered explored university-community partnerships (Morrison et al. 2019). This framework was first conceptualized in the early 1990s in Oklahoma City when a group of stakeholders came together to tackle much needed infrastructure projects which required private-public partnerships. The undertaking they faced was how to get a group of people, who do not have to account to each other, to come together to focus on a common task. Rather than using traditional, long-range strategic planning methods, the president of the Chamber of Commerce, Ed Morrison, utilized a short, continuous iterative approach of experiments, now referred to as an *agile* or *design thinking* process (Morrison et al, 2019). This model addressed the issue of how loosely connected networks of community partners could work together on a complex collaboration (Morrison et al, 2019). Morrison went on to test and develop his model of reflective theory of development for entrepreneurial ecosystems named Strategic Doing™ in many communities with success (Morrison, Barrett, & Fadden, 2019, Hutcheson & Morrison, 2012). The university-community partners for this article's project used the Strategic Doing™ model to develop a program that introduces students to methods of addressing complex local problems.

Significant research supports the need for developing competencies in dealing with complex, dynamic, and interactive challenges facing the modern world (Ramírez & Montoya, 2022). Many of these studies link complex thinking, critical thinking, and creative thinking to addressing societal changes. An often-used methodology is a dynamic and generative observation and feedback loop to understand both the user perspective as well as the macro impact of the problem. This human-centered design process, found in the design-thinking methodology, is now being adopted, in whole or in part, in teaching the development of these innovative skill sets (Garbuio, 2018).

Innovation often starts with communication, interdisciplinary networking, and collaboration within a team (Bilén, et al, 2005). Along with team-based skills, innovation also requires a systematic ability to manage and organize the elements of a project, as well as to reframe the understanding of the process (Lynch, et.al. 2021). However, innovation also includes the ability to observe, empathize with the subject, and reflect on the problem to help further its focus and definition (Hagg, 2017). Innovation oftentimes embraces a degree of chaos, and the need to be adaptive within ambiguous and uncertain situations. Therefore, risk-taking and creative problem-solving are often needed in the process. Neck and Greene (2011) also make the point that this uncertainty can help challenge participants as they move from solving simple problems to taking on more complex problem-solving. These skills are needed to address complex challenges in today's greater society, as well as in the local community.

STRATEGIC PLANNING PHASE

In October 2021, the Lemelson Foundation provided seed funding to three universities, the University of Oregon, Oregon Institute of Technology (Oregon Tech), and Portland State University, to engage members of their communities in the development and implementation of a plan to strengthen their local innovation ecosystems (Lemelson Foundation, 2024). With the seed funding provided, Oregon Tech convened a diverse stakeholder group comprised of university faculty, staff, and students as well as numerous community organizations. The project utilized the Strategic Doing™ methodology and was facilitated by outside experts who partnered with the stakeholder groups to apply the Strategic Doing™ Framework and direct project activities (Morrison et.al, 2019).

The aspect of the university innovation ecosystem the stakeholder group identified to strengthen was, "How might we support student innovation while also creating value for our community?" (Figure 1). This work aimed to support the ongoing development of Oregon Tech's university-based innovation ecosystem, recognizing that the university lacked systems and processes to connect students with local economic development initiatives and formal mechanisms through which community stakeholders could engage with student inventors and entrepreneurs. To address this issue, the project provided an opportunity to expand and enhance the innovation and entrepreneurship experience at Oregon Tech with input from a wide array of community stakeholders. With this in

"How might we support student innovation while also creating value for our community?"

Figure 1: Central focus of the university-community collaboration.

mind, the strategic opportunity identified by the stakeholder group was to design a first-year experience that introduced students to innovative thinking within the context of a community-defined challenge. The overarching goal of the project was to provide opportunities for students to connect with the community, enhancing a culture of collaboration, while giving students real-world problem-solving experience.

Project Plan

This project incorporated Strategic Doing™, a methodology for building complex collaborations (Morrison et.al, 2019). This methodology enables people to quickly form action-oriented collaborations with a focus on ideation, prototyping, gathering feedback, and iterating solutions. It is a strategic approach that is intended to be lean, agile, and fast, enabling leaders to design and guide new networks that generate innovative solutions (Morrison et.al, 2019).

Recognizing that ecosystems are complex, during the startup phase of this project, the stakeholder group focused their discussions on how to use their assets to strengthen the university's innovation ecosystem in support of the community's broader economic development goals. The stakeholder group attended an initial workshop during which they identified the assets each stakeholder brought to the project, and opportunities that directly aligned with those assets, followed by the creation of outcomes and action plans based on the ecosystem's framing question. This process focused on answering three questions: (1) What could we do (given our assets), (2) What should we do (which assets could we leverage at that moment for the greatest impact), and (3) What will we do (our strategic opportunity).

The preliminary opportunities identified by the stakeholder group included linking the community's needs to university-based innovation opportunities and strengthening collaboration between community organizations and student innovators. To move the project forward from this point, Strategic Doing™ encouraged each stakeholder to identify a short-term action plan, specifically, what the stakeholder could get done in the next 30 days. 30/30 Meetings were scheduled to share what had been done in the last 30 days and to determine what needed to be done in the next 30 days. Emphasis was placed on what was learned, what adjustments needed to be made, and what needed to happen next (prototype, gather feedback, iterate solutions) (Morrison et.al, 2019).

From the 30/30 meetings, the stakeholder group began to coalesce around designing an event that would connect students to a specific opportunity/challenge in the community. The overarching goal of the stakeholder group was to design an experience that would introduce students to innovative thinking within the context of a community-presented challenge, thus strengthening collaborations and creating value for both the students and the community. With this in mind, the stakeholder group strived to design an event during which students would:

- Learn creative team-based approaches to problem-solving;
- Work alongside community mentors on a community-informed challenge; and
- Apply human-centered design to ideate innovative solutions.

In October 2022, this diverse group of university and community stakeholders piloted a day-long design thinking workshop (Ready, Set, Innovate!), marking the culmination of a year-long collaboration in which community members informed the design of this university experience.

Leverage

The Strategic Doing™ methodology was integral in leveraging this work. The framework not only enabled the project to expand the number of voices and organizations from the Klamath Falls community in these ecosystem-building discussions, but it also legitimized the process, resulting in sustained collaboration and engagement from the ecosystem partners throughout the project (Morrison, et.al, 2019). Moreover, this project explored how Oregon Tech fits into the Klamath Falls ecosystem (Hibbard, 2001). The project reiterated the importance of incremental and sustained collaboration across stakeholder groups, listening to the community's perspectives and what they value in a university-community partnership, the importance of goal alignment, and the need for systems, processes, and capacity to ensure this work is sustained and supported (Hibbard, 2001).

This project explored how universities contribute to the innovation ecosystem and innovation economy. As the project progressed, the stakeholder group learned more about how innovation ecosystems generally work to support invention-based enterprises and economic development and began to identify best practices to strengthen the ecosystem and improve resiliency. The stakeholder group continues to discuss how the lessons learned through these ecosystem-building efforts can be leveraged to inform Oregon Tech's approach to university-community partnerships and expand student access to invention, innovation, and entrepreneurial experiences. Specifically, we will:

- **Focus on Collaboration:** Rather than lead this work, how might the university support a model of sustained collaboration?
- **Prioritize Connections:** What are the university-based systems and processes beneficial for connecting stakeholders across the ecosystem?
- **Redefine Success:** How do we share a vision? Are our goals aligned? Do we have a common set of objectives across all community organizations that clarify our direction and outcomes?
- **Increase Awareness:** How might we increase the visibility of university resources and programming to optimize university contributions to the economic development ecosystem?

Ready, Set, Innovate! was designed to connect high school, community college, and university students with the local community, including industry experts, mentors, and community organizations. Increased student engagement in the ecosystem strengthens connections between the university and the community and creates a catalyst for collaboration across the ecosystem. Moreover, when students are the nodes that connect universities and their communities, they become contributors to the ecosystems that help communities thrive.

PROGRAM DESIGN

A primary goal of Ready, Set, Innovate! was to introduce and develop innovation skills among its participants; therefore, the organizers utilized a design thinking methodology as the basis of activities. Design thinking is considered a human-centered approach to innovation (IDEO,

2024). Drawn from studies of creativity by Max Wertheimer (1945), design thinking was first adopted in the late 1950s and early 1960s in the engineering design fields. Today, design thinking is widely recognized as a basis for teaching innovation (Tschimmel, 2012), and many fields use this user-focused feedback loop process for continuous iteration. Several members of the planning team have attended Stanford University's d.school, which provides a wide variety of training programs on the design thinking method (Hasso Institute of Design, 2024).

The Ready, Set, Innovate! event was designed to be a one-day experience in which participants ideate innovative solutions to a community challenge, utilizing a design thinking approach and actively practicing a broad range of innovative skills (Tschimmel, 2012). The following section will provide an overview of the program design, including the community challenges, event roles, program schedule and activities, instructional pedagogy, and materials.

Community Challenges and Sponsorships

This community-informed event was held in Klamath Falls, Oregon. Located in rural southern Oregon, the county's population is around 70,000, with a median income of $57,000 (U.S. Census, 2023). In decades past, the city relied on a strong footprint in the wood products industry. Not surprisingly, the community is constrained by socioeconomic challenges common to rural communities. Over time, these challenges have hindered economic growth.

The event's inaugural year theme, developed by the strategic planning group, was *"How might we reimagine Klamath Falls as a tourist destination?"* and it was sponsored by the university as a startup initiative. In its second year, the event was co-sponsored by an area healthcare organization and our regional hospital. The challenge identified by the planning team was: "*How might we maximize southern Oregon's rural advantage to build healthy communities?"* Both of these themes connected the program to widely seen economic concerns among community members and stakeholders.

Roles

The event required many stakeholders and volunteers who served in several roles. Since the focus of the event was on students, organizers created an organizational structure that supported the students through each stage of the process. These roles included the following:

- **Event Developers:** The event developers originated from the original strategic planning group. This group included a mix of university faculty and staff, business owners and leaders, as well as community and economic development champions. This group developed and ran the event.
    - **Innovation Fellows:** The event developers brought aboard four university student leaders who attended focused training on design thinking at Stanford University d.school. After completing their design challenge, students became University Innovation Fellows. They took on significant roles in the planning and execution of the events.
- **Event Sponsors:** Following the initial year, event sponsors provided financial support, and engaged in the planning process.
- **Students:** The student participants included high school students, along with community college and university students in a broad range of majors. In the second year, a small group of middle school students also participated. Teams of students were

generally placed in groups of five to six and grouped by college, high school, and middle school.

- **Community Volunteers:** A wide range of volunteers participated throughout the day or at key points during the event. This included help supporting registration, mentoring, as well as the empathy interview. Volunteers mainly included university faculty, staff, and community stakeholders.
    - **Empathy Interviews:** A large group of volunteers attended the event for 30-45 minutes to be interviewed during the empathy interview phase, providing feedback on the challenge's theme (Figure 2). An empathy interview is a process to gain a deeper understanding of a user's experience of the issue you are working to improve through conversations with users.
    - **Mentors/Senior Mentors:** Each team had a mentor who helped guide them through each step of the process. These mentors were often teachers, professors, and some community members. Senior mentors were assigned to several teams to help answer questions throughout the process.
    - **Clients/Judges**: Near the end of the event, students presented their ideas to judges, who provided real-time feedback. Judges included an array of event sponsors, community business owners, educators, and other stakeholders.

Figure 2: Community volunteers and students during empathy interviews phase.

Activities

The Ready, Set, Innovate! innovation clinic activities ran for the length of a traditional school day with students arriving at 8:00 and the program finishing around 3:00. This seven-hour experience included the following schedule and activities:

- **Registration:** Participants arrived and registered. They were served a light breakfast and completed the pre-event survey before gathering for the welcome session.

- **Welcome & Overview Session:** To kick off the event, an opening session gathered all student participants, mentors, sponsors, and other stakeholders to welcome them to the campus. This session included an overview of the community challenge, along with a brief introduction to the design thinking process. In addition, the program featured a keynote speaker who shared the impact creative problem-solving had on their career.
- **Empathy Phase:** All groups moved to their team spaces that were pre-prepared with the needed materials for the day's event. The first activity was to learn about the importance of gathering information from other stakeholders to gain perspective on the challenge. This was done through empathy interviews in which participants asked community members questions related to the challenge.
- **Define Phase:** Following this exercise, students were instructed on how to "unpack" their interviews to determine common themes that would help them begin to ideate solutions. This process helped to further define the underlying problem within the challenge.
- **Ideate Phase:** Following the define phase, the next step was to brainstorm a host of ideas using a tool called *"How Might We."* Participants generated as many ideas as possible by building on each other's ideas. At this stage, since there were no wrong answers, students were encouraged to shout out every idea they had. Following idea generation, ideas were clustered around common themes. After that, team members used colored sticky dots to select their top ideas.
- **Prototype Phase:** After the ideate phase, each team's top idea was further developed into a prototype to be tested. Groups were provided a box of art-supply materials, such as construction paper, straws, scissors, boxes, etc., to create a low-tech prototype. Once the prototype was developed, the team developed an improv demonstration for the testing phase.
- **Testing Phase**: Using their low-tech prototype, student teams tested their idea with other teams to get feedback. Once feedback was gathered, adjustments were made, and the idea was given a title.
- **Tell Phase**: For the tell phase, several groups gathered to present their idea to a group of diverse judges. The judges questioned the students and provided further feedback. All ideas were displayed on a Solutions Wall during the closing session.
- **Closing Session**: During the final session of the day, teams came back together for a full group session to summarize the day and share ideas.

Instructional Approach

The instructional approach was carefully considered and planned for the event since student teams were spread out across a very large building over two floors. The organizers purposely utilized the University Innovation Fellows (the student leaders who had received specialized training in design thinking at Stanford's d.School) to help facilitate the event. The Fellows took the lead in developing, as well as delivering, the instruction (Figure 3). The following details the approach taken and how this approach was revised for the second year based on lessons learned in year one.

Year One

During the first year's event, student participants were provided instructions at each phase of the process through the use of in-person demonstrations. At each stage in the process, students

were summoned back to a central meeting area by a loud gong so they could watch a demonstration provided by the University Innovation Fellows. This format was initially chosen because it promoted interaction between the students and the Fellows while also adding an interactive element to maintain attention.

Figure 3: Innovation Fellows

This approach succeeded in creating a high-energy environment, but it also created some issues. There were logistical issues in gathering the students to view the live demonstrations, including increased foot traffic throughout the building and potential safety issues. Moreover, this central approach required significantly more time to gather students than originally anticipated. There were eight live demonstrations throughout the day — each of the demonstrations, following the welcome session, involved calling all of the teams together, waiting for the teams to be ready to listen, demonstrating the instructions, dismissing the teams, and waiting for them to get back to their stations. This process was inefficient and led to a reduced amount of time for each phase. A secondary issue that arose was that poor acoustics in the area in which the demonstrations were performed made it difficult for teams in the back to hear the instructions. This resulted in a more frustrating experience for those teams. Since this event was designed to encourage out-of-the-box thinking from students, this issue made it more difficult for students to perform as intended.

Year Two

To solve the issues experienced with the live demonstrations, the decision was made to switch to pre-recorded videos. The University Innovation Fellows filmed seven instructional videos outlining the design thinking process that were shown to the students throughout the event. In the videos, the Fellows demonstrated each of the phases and applied it to the current challenge theme. The videos were posted on the event's YouTube channel and accessed through QR codes provided at each station (Ready, Set, Innovate, 2023). Students scanned the codes on their mobile devices as they went through the steps of design thinking. Mentors also had access to the videos and could play them on their own devices if students could not. This approach addressed the two main logistical issues from the previous year; it eliminated the time wasted gathering students and the audio challenges.

There was concern that this format would lead to a decrease in the energy felt during the event, but this was not the case. Teams were still energetic and engaged throughout the event. One of the participating schools, coming from farther away than others, was supposed to leave the event early to get their students home. However, they ended up staying longer than planned because they enjoyed the event so much.

Overall, this format led to a more immersive experience of design thinking. The students continuously collaborated with their team without being disrupted or pulled away from their work. They formed closer relationships with their team members and mentors, fostering greater creativity and increased enjoyment.

Materials

Along with the video instruction, the event developers made great efforts to develop a host of materials that would supplement the instruction provided throughout the day. These included a student notebook, a mentor guide, and a detailed station set up for each team (Figure 4) to help them work through the process.

Figure 4: Team Station Set Up

- **Station Set up**: Each of the stations contained a grouping of 12 posters that provided details about each step of the design-thinking process, along with a QR code to each instructional video. This served to break down the steps and visualize the process for each team and mentor. Each setup also included post-it notes, stickers, and blank posters to use for brainstorming and sorting thoughts as they ideated (Figure 4).
- **Student Notebooks**: In addition to the station setups, each student received a notebook that detailed the process from start to finish. Directions and specific details on some processes, like the interviews, were provided. The notebooks also included several blank pages to jot notes as they proceeded through the event.
- **Mentor Guidebooks**: In addition to the student notebooks, a separate guidebook was prepared for the mentors. Along with the process, this notebook included details about the mentor's role at each stage, helpful hints, and what to watch out for as the students progressed through each phase.

Together, these materials supplemented the video instructions, providing an array of resources for the participants and their mentors to refer to throughout the event. In addition to these instructional guides, the developers also had stickers and buttons for students to earn as they demonstrated innovative mindsets throughout the day.

OUTCOMES

The first Ready, Set, Innovate! event was held in October of 2022. The event hosted 95 students, which included 67 high school students from 5 schools along with 28 college students from 2 schools, forming 20 teams. The following October, the event supported 30 teams and included 81 high school students from 5 schools, 27 college students from 2 schools, and the addition of 16 middle school students from one school. Of these students, 20% had attended the event the prior year, while 80% were attending for the first time.

Data were collected from a variety of stakeholders to determine the success and effectiveness of the event. These data were also incorporated to make improvements for future events. The data included pre- and post-student participant surveys to better understand the student experience, including the skills students used, as well as new skills they were exposed to during the event. Feedback was also collected from mentors who participated in the event and from sponsors during follow-up meetings. The following provides a summary of the data collected at the 2023 event.

Student Experience

To understand the student experience, pre- and post-surveys were administered as students arrived at the event and during the final summary session of the day. The pre-survey included demographic information along with questions about their experience and confidence with various innovation skills, such as communication, collaboration, observing, empathizing, dealing with uncertainty, taking risks, and problem-solving (Bilen et al., 2005; Hagg, 2017; Neck & Greene, 2011). In addition, the students were asked to share three words about how they were feeling at the start of the event. The post-survey was similarly constructed to allow for comparison, asking students to share their experience and confidence regarding the various innovation skills following the event. Students were again asked to share three words that described their overall experience at the event.

When comparing the pre- and post-results, students indicated that they gained experience with most of the targeted innovation skills. For example, at the beginning of the event, most students reported their experience in taking risks was below average (25%), above average (48%) or high (24%) (Figure 5). However, following the event, this shifted to higher levels with most students reporting above-average (51%) or high (32%) experience. A similar shift was witnessed in their confidence in taking risks. At the beginning of the day, 63% of students reported above-average confidence in taking risks. In comparison, by the end of the day, this had shifted such that 48% of students reported above-average confidence and 38% reported high confidence (Figure 6).

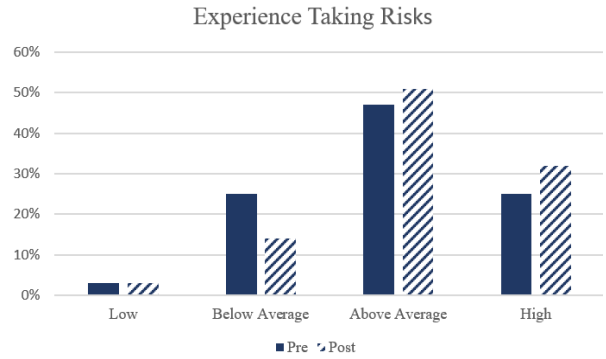

Figure 5: Pre-Post Experience Taking Risks

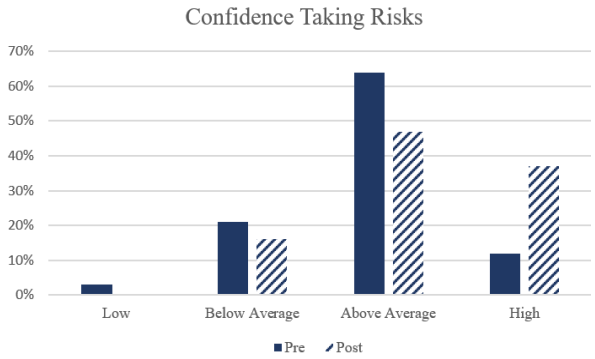

Figure 6: Pre-Post Confidence Taking Risks

Moreover, in the area of team collaboration, students reported that they gained experience and confidence. At the start of the day, a majority of students (67%) reported above-average experience with team collaboration (Figure 7). At the end of the event, this shifted to 58% of students reporting above-average experience and 40% reporting high levels of experience (Figure 8). Similar results were witnessed in the students' confidence in team collaboration. Before the event, 70% reported having above-average confidence working with teams. By the end of the day, this was split between 56% reporting above average and 40% reporting high levels of confidence working with a team. Similar results were seen in the areas of managing a project, communicating with new people, observing, and dealing with uncertainty. There was less of a shift seen in the students' experience and confidence in empathizing with others.

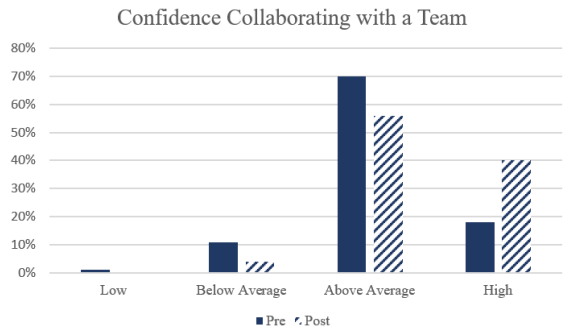

Figure 7: Pre-Post Experience Collaborating with Teams

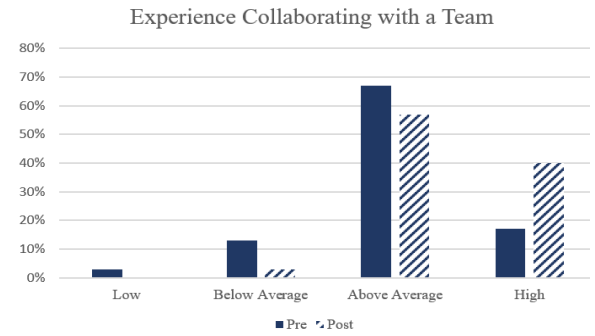

Figure 8: Pre-Post Confidence Collaborating with Teams

Students were also asked to provide three words at the beginning and end of the day describing their current feelings about participating in the event. The words used most often to describe how students were feeling at the start of the event included Excited, Nervous, Happy, and Ready, closely followed by Curious and Good (Figure 9). Considering that 80% of the students attending had not participated in the event before, it was expected that most students would feel somewhat apprehensive at the start of the event. At the end of the day, the words most often used to describe their experience included Fun, Excited, Amazing, Cool, Informative, and Happy

(Figure 10). From these results, event planners concluded that the overall experience was engaging for the majority of students.

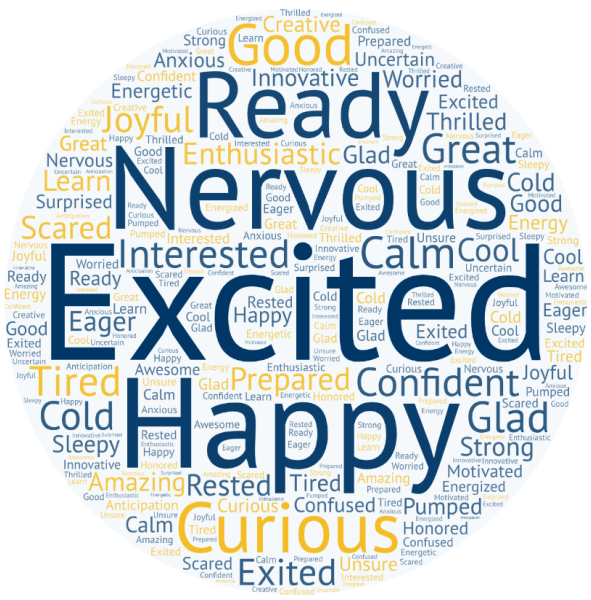

Figure 9: Pre-Survey, Student Three Words

Figure 10: Post-Survey, Student Three Words

There are limitations to pre- and post-reflection-based surveys designed to collect these data. Clearly, students are overconfident in reporting skills overall; however, the goal was to determine if there was a shift in how students reported these skills before and after the event to determine its impact. In addition, incorporating this survey into the event allowed students to reflect on the skills they may have gained by participating. In the future, the survey will be incorporated in a more intentional way to allow for additional time for the students to reflect upon their learning.

Mentor Insights

Along with assessing the student experience, the team also collected feedback from mentors to gain insight into their experience, including ways to improve the experience for both students and mentors. This was done through a simple Start, Stop, Continue feedback exercise that was shared with mentors following the event.

Feedback Regarding the Student Experience

Overwhelmingly, mentors felt that the event was a success; it provided a unique experience for students to be introduced to design thinking and problem-solving skills to benefit their community. The event provided opportunities to apply and practice these competencies, as well as an occasion to reflect beyond their day-to-day routine and consider the circumstances of others within their world. These sentiments are apparent in the following mentor and teacher quotes:

"As we walked out to our bus, my students said 'Thank you' to me several times because they truly enjoyed the learning opportunity. I watched students make notes, step out of their comfort zones, and stretch their tolerance levels when someone else didn't take their suggestions as seriously as they thought they should have. This was an amazing experience that we will be taking back to the classroom to share." (Mentor-Teacher)

"One thing that really surprised me was how the students tackled a topic that they probably had never heard of, tried to understand it, and come up with possible solutions. It is a great indication that our students are not afraid of challenges and that they will rise to the challenge." (Mentor-Teacher)

"I saw many of my students who are normally shy, get out of their comfort zone as the day went on. Seeing them become comfortable while working in their groups (even if they didn't know the other members), then presenting in front of community members was awesome." (Mentor-Teacher)

Mentors also identified areas in which the event could be improved. Several mentors suggested that while the introduction session was helpful, both students and mentors walked into the activity not fully understanding what was ahead of them for the day. As such, many noted that an overview of the design thinking process and its purpose would provide a roadmap of the day for all participants. Moreover, during the closing session, a recap of the day, along with a review of some of the skills they applied throughout the day would allow for reflection. Mentors added that it would be helpful to share how the process could be used in other settings, which could include examples from prior events.

Additionally, mentors noted that the interview session, which required students to interact with unknown people in a safe environment, was helpful for the students to gain confidence in interacting with others. This session also allowed students to consider the perspectives of others as they developed ideas and solutions to the challenge. However, many noted that while it was helpful to prompt the students with sample questions, it would also be advantageous to require students to develop their own questions for the interview session.

Feedback Regarding the Mentor Experience

Mentors were provided access to the student training videos before the event to help them prepare for their role as mentors. However, despite this video training, most mentors described needing more direction to understand each step and the overall objective of the day's events.

Several suggestions were provided to address additional mentor training. Mentors noted that in-person training for mentors would be helpful. This could be the morning of the event or a day prior. In addition, mentors and event planners noted that strategically using more "senior mentors," mentors with design thinking experience who would be assigned to several student teams, would ensure that mentors received assistance in clarifying the design thinking process when needed. Lastly, providing both students and mentors with an overview of the process at the beginning of the day was suggested as a way to provide additional direction.

Overall, the mentors found that the event provided a great opportunity for students to be engrossed in an activity that developed a variety of skills while also being exposed to challenges

within their community. This problem-solving experience allowed both students and mentors to learn how to use the design thinking process to iterate ideas and solutions.

Sponsor Insights

The sponsors also found the event to be successful, and more specifically, that it aligned with their organizations' goals of supporting the community. The mission statement of each sponsor, including the university, includes some reference to the organizations' commitment to the community. This event brought together the university and the community to create a student experience with the common goal of strengthening university-community partnerships.

A recognized challenge of the event was the ability of stakeholders to follow up after the event to discuss and further develop some of the ideas the students developed in a meaningful way. The addition of sponsors in year two helped with this challenge. During the inaugural event, the organizers chose to allocate more time to the early stages of the design thinking process. Although students presented their solutions to a community client at the end of the day, these solutions were not captured by the organizers. The strategic planning group quickly recognized this oversight and, in year two, sought to improve how students' solutions would be captured at the conclusion of the event. To address this concern, the organizers ensured that additional time was allocated to the "Test" and "Tell" stages of the design thinking process. At the end of the day, students still pitched their ideas to community partner; however, they were also asked to come up with a headline for their idea which was shared on a "Solutions Wall" at the closing session. This wall served as a visual collage of every idea the teams produced. Additionally, the sponsor of the event was invited on stage during the closing session to share what they had observed throughout the day and to speak about the solutions presented.

The addition of a community sponsor also allowed for needed funding to support the event. Following the second year, the organizing team immediately secured a sponsor for the next year's event, which allowed them to plan in advance to improve the event.

DISCUSSION

University-community partnerships are most impactful when they coalesce around a shared vision with well-aligned goals and priorities. The success of Ready, Set, Innovate! can be attributed in part to the incremental and sustained collaboration that occurred within the strategic planning group to ensure the event aligned with the mission and goals of both the university and its community partners. Historically, both the university and the community had focused on university graduates to drive economic growth within the community. The university hosts an annual innovation and entrepreneurship competition that encourages students to solve community-relevant problems. Over time, however, it became apparent that more needed to be done to connect students to the community beyond this capstone experience. To address this shortcoming, the group focused instead on an event that would introduce high school, community college, and early career university students to the community and the idea of innovative problem-solving using a community-defined challenge. Existing relationships between event organizers and the community made this possible. Additionally, the community was able to access university expertise while the university leveraged community partnerships to support the goals of the event.

Continued engagement of both community and university stakeholders around Ready, Set, Innovate! has served as a cornerstone in strengthening the broader partnership. This prolonged involvement has fostered a sense of ownership and commitment among stakeholders, ensuring their vested interest in the project's success. Moreover, the alignment of shared missions, particularly when the challenge resonates with all parties involved, underscores the importance of collaboration. Pre-existing relationships within smaller communities provided a solid foundation for this work, facilitating smoother interactions and mutual understanding. The enthusiasm to cultivate partnerships further enhanced cohesion, as evidenced by the ease of attracting sponsors and increased participant engagement with the events. This interdependence between the university and the community underscores a reciprocal relationship, where both entities rely on each other's support, ultimately reinforcing the fabric of university-community partnerships.

Ready, Set, Innovate! has also been intended to serve as a jumping-off point for students interested in engaging in innovation and entrepreneurship experiences while at the university. This early-entry event serves as a needed bookend to the Catalyze Klamath competition, a decade-long community-sponsored event, where college students pitch their business and technology ideas and compete for startup funds. The strategic planning group's long-term goal is for Ready, Set, Innovate! to become an introductory experience that will foster ongoing connections with the community while also nurturing an innovative and entrepreneurial spirit among participants. By actively engaging with local stakeholders and addressing community needs, these events become an integral part of the broader student experience, cultivating a culture of innovation and entrepreneurship. While Catalyze Klamath was initially focused on contributing to economic development, it has evolved toward emphasizing increased student engagement within the community. Although the contest's direct impact on job creation might be limited, this new focus underscores a deeper commitment to contributing to the long-term vitality and resiliency of the community through innovative and entrepreneurial thinking.

Looking ahead, future plans and iterations of this project will prioritize sustainability, aiming to serve a growing number of students despite limited resources. To achieve this goal, the focus will be on developing comprehensive materials and training to streamline instruction, thereby reducing reliance on human resources such as mentors, innovation fellows, and volunteers. The intention is to develop a replicable model that can be scaled to meet increasing demand fueled by the growing popularity of the event. Efforts will be directed towards building a robust structure that is not dependent on individual contributors, ensuring continuity and longevity in fostering innovative and entrepreneurial problem-solving within the university-community partnership.

LIMITATIONS AND FUTURE WORK

The goal of this article is to provide a case study of how a desire to strengthen a university-community partnership led to the development of an innovation event. The purpose is not to provide in-depth research on the long-term skills developed from the event. Relying solely on pre- and post-event surveys to gauge the skills students used and were exposed to during the event provided the organizers with a snapshot of the immediate impact, but was not meant to provide a comprehensive understanding of skill development. Surveys that capture self-reported data can be influenced by various biases, such as social desirability or recall bias. Furthermore, mentors' feedback, while helpful in improving the event, may provide a limited understanding of the

outcomes of all participants. Therefore, future research may include longitudinal data collection to assess the sustained impact of the event on participants' skills, education, and career development beyond the immediate post-event period.

Future work involving community-university partnerships in innovation skill development that benefits the community could explore several avenues. Continued collaboration with local businesses, government agencies, nonprofit organizations, and local businesses could enhance the relevance and applicability of skill development initiatives, aligning them more closely with community needs and priorities. Furthermore, integrating experiential learning opportunities such as internships, community-based projects, and industry partnerships could provide students with real-world contexts for applying their innovation skills while addressing community challenges. Overall, future work should aim to foster mutually beneficial partnerships that empower stakeholders, strengthen communities, and drive inclusive economic development through innovation.

CONCLUSIONS

This article provides an overview of a process used to strengthen university-community partnerships through the development of an innovation clinic that introduces students to creative problem-solving skills within the context of a community-defined challenge. The process used by the strategic planning group was described and uncovered ways to align common goals across a diverse group of stakeholders. By leveraging the Strategic Doing^{TM} model, the stakeholders were able to create an innovation clinic for students to learn innovative problem-solving skills and engage with the community. The details of the design-thinking program were provided, as were the outcomes of the event from the perspective of the students, mentors, and sponsors. Finally, key insights were presented related to both current successes and future challenges with the goal of ensuring the sustainability of the event in support of continued student-university-community engagement.

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HUMAN-CENTERED EXPERIENTIAL LEARNING: LESSONS LEARNED

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ABSTRACT

This study explores experiential learning in business education using human-centered design (HCD), focusing on the Understand and Synthesize phases. We interviewed 16 stakeholders, including students, corporate clients, and faculty and visually mapped the insights through user journeys, highlighting challenges like student stress, the need for agile methods, and the overlooked experiences of faculty and clients. These findings inform strategies to enhance experiential learning, guided by "How Might We" (HMWs) questions that frame opportunities for solutions. The goal is to design impactful solutions that benefit students, clients, and faculty that eliminate the pain points uncovered during the user research.

INTRODUCTION

Experiential learning, a dynamic and transformative educational approach, emphasizes learning through direct experience and reflection. This method centers on hands-on experiences as a means of acquiring knowledge, skills, and understanding, contrasting with traditional classroom-based or lecture-style learning that relies heavily on passive absorption of information (Kolb, 2014; Morris 2020). By engaging in real-world tasks, learners develop critical thinking, problem-solving skills, and adaptability, which are crucial in today's fast-evolving landscape (Helyer & Corkill, 2015; Wilson & Beard, 2013). Business schools are increasingly forging partnerships with corporate clients to create impactful experiential learning opportunities, allowing students to gain practical experience in solving real-world problems and organizational situations (Johnson, 2019; Talafuse, 2021). Studies have shown that experiential learning offers several advantages over traditional methods, including immediate application of knowledge, real-time coaching and feedback, enhanced teamwork and communication skills, and reflective learning (Kamis & Khan, 2019).

Despite the well-documented benefits of experiential learning, gaps remain in understanding the needs and motivations of various stakeholders, such as corporate clients and faculty who facilitate experiential learning (Kolb & Kolb, 2005). Existing research often focuses on student outcomes, overlooking the perspectives of these key stakeholders who play crucial roles in the success of experiential learning projects. Understanding these stakeholders' experiences, challenges, and needs is essential to improve the overall effectiveness of experiential learning programs.

To address this gap, this paper examines experiential learning through the lens of human-centered design (HCD). HCD is a problem-solving approach that identifies the unmet needs of a population to collaboratively and iteratively develop solutions (Brown, 2008). HCD improves traditional methods by providing a structured approach to empathize with and define the challenges faced by all stakeholders involved in experiential learning. Unlike previous approaches that may have employed generic or top-down solutions, HCD emphasizes iterative, user-driven insights, allowing for more targeted and effective interventions (Brown, 2008). Previous applications of HCD in educational and business settings have demonstrated its efficacy in uncovering nuanced needs and developing solutions that are well-aligned with users' experiences (IDEO.org). For instance, HCD has been successfully used to redesign educational curricula and improve customer service processes, showcasing its potential to address complex, multifaceted challenges (Brown, 2008). By placing educators, corporate clients, and students at the center of the design process, HCD helps uncover nuanced insights into how experiential learning methods are perceived and utilized. This empathy-driven approach can identify specific pain points and gaps that traditional studies might overlook.

Our findings highlight several critical insights. Firstly, the study reveals significant stress and burnout among students involved in experiential learning projects, necessitating immediate attention to their well-being. Secondly, the research underscores the need to bridge the divide between academia and industry, advocating for more agile methodologies with fluid scopes and deliverables. Finally, by illuminating the often-ignored experiences of corporate clients and faculty, the study contributes to a more holistic understanding of experiential learning. These findings are crucial for developing strategies that address the diverse needs of all stakeholders, ultimately enhancing the effectiveness and impact of experiential learning in business education.

CONCEPTUAL FRAMEWORK: HUMAN-CENTERED DESIGN

Lawrence et al. (2021) have developed the HCD Taxonomy that outlines five design spaces (understand, synthesize, ideate, prototype, and implement) (See Figure 1) This taxonomy was designed iteratively with designers, researchers, and teachers from multiple disciplines to develop a flexible tool that can be used across contexts.

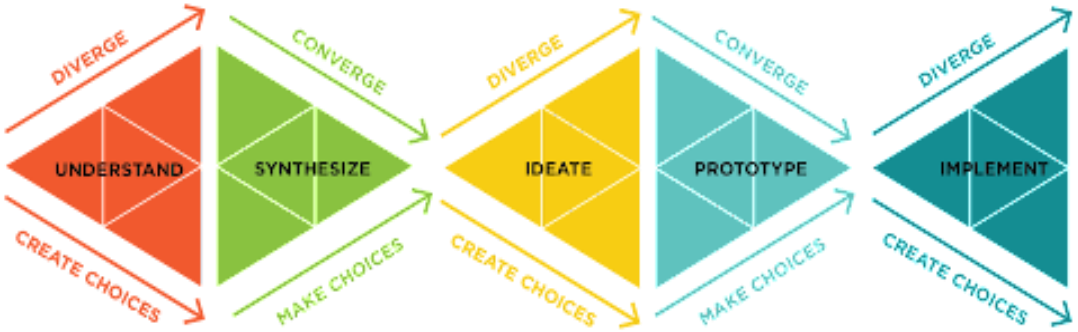

Figure 1. The Human-Centered Design Spaces

Each phase plays a crucial role in ensuring that the final solution is well-aligned with the needs and desires of the end users. In this paper, we will focus on the first two stages to highlight how the Understand phase involving user research with various stakeholders, helped uncover deeper insights and recommendations that can help experiential learning more effective in business schools. These recommendations are framed as How Might We's and visually explained with journey maps- both design tools that enable user-focused solutions.

Here is an overview of each of the five stages (Rosinksy et al., 2022):

1. Understand: This is all about understanding and empathizing with the needs and experiences of the users. It gives a comprehensive understanding of the users and their context, which forms the foundation for the subsequent phases. One of the key activities at this stage is user research which helps gather deep insights into the user's problems and needs. For this project we employed tools like interviews as part of our user research to gather insights.
2. Synthesize: This phase is a bridge between understanding the users and creating solutions for them. It transforms raw data into actionable insights that guide the design process. For this project, based on the user research, we synthesized the information and found underlying patterns. This helped us identify deep user needs and pain points and formulate design opportunities using How Might We statements based on the insights.
3. Ideate: Here's where creativity takes center stage. At this stage, the focus is on brainstorming a wide range of solutions to the defined problem. Techniques like sketching, mind mapping, and role-playing can help explore unconventional ideas and challenge assumptions.

4. Prototype and Test: Instead of diving headfirst into complex designs, HCD emphasizes creating low-fidelity prototypes, which are basic models or simulations of the ideas. This allows for quick testing and iteration without significant investment. Testing involves getting user feedback on the prototypes. This feedback is used to refine the prototypes and iterate on the design solutions.
5. Implement: Implement the solution iteratively.

METHODOLOGY

This represents the "understand' phase of HCD. In this section, we will describe the first triangle- understand. HCD starts with empathy and understanding, placing designers in the shoes of users to deeply understand their context, challenges, and needs. This empathetic approach uncovers the underlying motivations and emotions that drive behaviors, leading to more accurate and meaningful insights (Liedtka & Ogilve 2011). To understand the users, HCD relies on qualitative interviews, and we used open-ended interviews that evoked untold stories from participants reflecting their attitudes, motivations, pains, and frustrations.

Setting

To gain a deep understanding of experiential learning in academic settings, we focused on a mid to large-sized business school in the Midwest that is actively engaged in experiential learning across many of its courses and business curriculum for its students. The business school has an office that handles experiential learning projects of many kinds- from project-based action learning courses with 200+ clients to student-run professionally managed university consultancy and student-based consulting firm that provides startups with innovative, strategic, research-backed business advice under professional guidance.

Recruitment and Selection of Participants

The recruitment of participants was carried out through targeted outreach e-mails and phone calls to the corporate clients, faculty, students, and staff involved in experiential learning projects. We aimed to include a diverse range of stakeholders, including students, corporate clients, faculty members, and staff, to gain a comprehensive understanding of the experiential learning landscape. The demographics of the participants are shown in Table 1.

Table 1: Demographics of Participants

	Corporate Client	Faculty	Student	Staff
Race/ Ethnicity	5 Caucasians 1 Asian	1 Caucasian 1 Asian	3 Asian 2 Caucasian	3 Caucasians
Gender	4 Male; 2 Female	1 Male; 1 Female	3 Female; 2 Male	2 Male; 1 Female
Repeat Clients	4 Repeat; 2 Potential			

Students: Students were recruited from various business programs with ongoing experiential learning projects. We selected participants based on their involvement in these projects to ensure their insights were relevant and based on firsthand experience.

Corporate Clients: Corporate clients were identified through partnerships with the business school involved in experiential learning initiatives. These clients were chosen to represent a range of industries and project types, providing a broad perspective on the challenges and successes of working with students.

Faculty: Faculty members were recruited from business schools known for their engagement in experiential learning. Despite efforts to include more faculty, only two participated. This limited number was due to scheduling conflicts and availability, which impacted our ability to reach a broader sample.

Staff: Staff members involved in supporting experiential learning projects were included to provide insights into the operational and administrative aspects of these initiatives. The staff's role in facilitating and managing these projects makes their perspective valuable for understanding the broader context of experiential learning. Staff interviews added significant value by revealing the behind-the-scenes challenges and support systems that affect the implementation of experiential learning projects. Their insights into logistical, administrative, and support-related issues complemented the perspectives of students, faculty, and corporate clients, creating a more holistic view of the experiential learning environment.

Saturation and Data Collection

To achieve saturation, we employed a qualitative approach focusing on depth rather than breadth. We conducted in-depth interviews with participants until we reached a point where no new themes

or insights emerged. For faculty, despite the limited number of participants, we ensured a comprehensive understanding by exploring their experiences in detail. For other stakeholder categories, such as students and corporate clients, we engaged with a larger number of participants to gather a wider range of perspectives.

The inclusion of staff, although it resulted in a higher number of interviews compared to faculty, was justified by their crucial role in the management and facilitation of experiential learning projects. Their perspectives provided valuable context and highlighted operational challenges and support mechanisms that directly impact the success of these projects.

Procedure

The "understand" phase of HCD is considered divergent because it's all about broadening the understanding and exploring a wide range of possibilities (Liedtka & Ogilve, 2011). Divergence in the understand phase allows to go beyond surface-level information and uncover the underlying motivations and pain points that drive user behavior. Divergence in the understand phase also helps set aside biases and explore the problem space from different angles. To do that, we conducted in-depth open-ended semi-structured interviews with a diverse set of stakeholders, including students, faculty, corporate clients, and staff. We created an interview guide (separate for each stakeholder group- faculty, students, clients, and staff- see Appendix) to uncover attitudes and behaviors of these stakeholders during the experiential learning process. These interviews contained many open-ended questions like “tell me about a time…” that evoked untold stories and expressed deeper feelings and attitudes. The team conducted internal pilot interviews to refine the flow before conducting non-recorded stakeholder interviews. In total, 16 interviews were conducted. For every interview, there was one lead interviewer and two note-takers. All the notes were transported to Miro (miro.com, an online virtual whiteboard) and the team met to debrief and download after every interview. This consisted of discussing the verbatim quotes and putting them on Miro. Also, the "debrief" phase involved team reflection and discussion to evaluate and interpret the findings from every interview.

RESULTS

This represents the second tringle–synthesis phase of HCD. Synthesis looks for patterns in user research to identify underlying themes and needs (Liedtka & Ogilve, 2011). It's where all the information gathered from the user research stage (“Understand” phase) is transformed into actionable insights that act as guide for viable solutions. The synthesis phase is crucial in that the solutions are based on user needs and insights (Rosinksy et al., 2022). For this project, we gathered insights for various stakeholders: the clients, students and faculty. These are explained in the next few paragraphs.

Clients: These are companies that collaborate with educational institutions to offer internships, consulting projects, and other experiential learning opportunities. The interview with clients helped us uncover these insights:

1. **Value:** Clients value the unique perspectives and energy that students bring to projects. This fresh outlook can lead to innovative solutions and new approaches. Some sample quotes highlighting this issue are:

"It is energizing to be able to connect with students. There is a value in that from a motivation and energy standpoint."

Bringing that fresh raw talent...The success of Robinhood was [because of] young students who wanted to get into investing!"

"Another takeaway...students are able to call any company and get information they wouldn't otherwise be able to get."

Clients appreciate the novel contributions students make, which highlights the importance of maintaining this value proposition in experiential learning projects. Recognizing and harnessing this unique contribution can enhance the collaborative process.

2. **Flexibility:** Clients favor a flexible approach with constant communication, valuing adaptability throughout the project. Some sample quotes highlighting this are:

"Send me an email. Send me a message tonight, tomorrow. Send me something in the moment so I can give you a response in the moment."

"I think for me there are a lot of indirect benefits that agile brings, the constant communication builds relationships in a team."

Emphasizing flexibility and ongoing communication can significantly improve client satisfaction and project outcomes. Agile methodologies that support constant feedback and iterative adjustments align well with client preferences.

3. **Relationship Building:** Clients are focused on building strong relationships with the team rather than just completing paperwork. They view the project as a component of a broader relationship. Some quotes highlighting this are:

"[The intake form] was a good exercise...but it wasn't memorable."

"Think of it as a larger relationship where the project is not the relationship itself. The project is a piece of the relationship."

A relationship-centric approach can enhance engagement and ensure that projects are more integrated with clients' broader goals, leading to more meaningful and effective collaborations.

Students: In analyzing student interviews, we identified several core issues impacting their experiential learning experiences. These are:

1. **Ambiguity:** Students often struggle with the ambiguity inherent in real-world projects compared to the structured nature of classroom learning. Some quotes are:

"It was difficult to get started, I was a little lost, we were a little confused as we were just sophomores."

"It's hard to define a scope statement until you've had some navigation and discussion to figure out what's feasible and realistic."

Addressing the challenges of ambiguity by providing clearer guidelines and support can reduce student frustration and improve project outcomes. Better preparation for managing uncertainty is essential for enhancing student performance in experiential learning.

2. **Rapport:** There is often a lack of meaningful communication between students and clients, resulting in transactional interactions rather than collaborative relationships. Some quotes that highlight this are:

"I think students were afraid to send me an email with a question."

"Clients have given feedback at the end presentation where they tell students they should have contacted them more."

Improving rapport and fostering open communication channels can enhance collaboration and make the learning experience more rewarding for students. Building stronger interpersonal connections is crucial for successful project outcomes.

3. **Stress:** Students experience stress and burnout due to the unstructured nature of experiential projects and evolving client expectations. Some quotes that highlight the stress are:

"It was nerve-racking at the beginning...Clients do push you. They don't give you much feedback."

"I called my Mom and said I'm not sure if I'm doing the right thing...It was kind of an emotional thing at times."

Addressing stress by providing better support systems and managing client expectations can enhance students' ability to handle challenges effectively. Ensuring students receive adequate feedback and support is crucial for their well-being and project success.

Faculty: Faculty members, who play a critical role in facilitating experiential learning, provided insights into their experiences and challenges. Some of these insights are:

1. **Liaison Role:** Faculty often serve as the primary point of contact between students and clients but lack adequate support for managing these relationships effectively. Some quotes that support this insight are:

   "If I don't keep the connection in spring...I will not have clients for the fall."

   "The challenge is finding clients and keeping them as repeat clients."

Enhancing support structures for faculty in managing client and student relationships can improve the effectiveness of experiential learning programs. Providing resources and training for faculty can facilitate better management and continuity in these engagements.

2. **Misalignment of Expectations:** There is often a misalignment between faculty and client expectations, which can lead to misunderstandings and less successful outcomes. Some quotes that highlight this are:

"Managing client expectations is a challenge and making it a real engagement for students is a real challenge."

"If students feel that this is a proxy real consulting engagement, students will be eager to perform."

Aligning expectations and providing clear communication channels between faculty and clients can mitigate misunderstandings and enhance the effectiveness of experiential learning. Ensuring that all parties are on the same page is essential for successful project outcomes.

In summary, synthesizing the results from various stakeholders through the HCD framework has revealed critical insights into the needs and challenges faced by clients, students, and faculty. Addressing these insights—such as enhancing flexibility and communication, managing ambiguity and stress, and improving relationship management—can lead to more effective and impactful experiential learning experiences.

DISCUSSION

What do these insights from each stakeholder's perspective mean for business schools as they design their curriculum around experiential learning, or what do these insights mean for schools that are looking to make their experiences better? We use two design tools to suggest solutions and implications.

1. Journey maps: Journey maps visualize the end-to-end experience of users, bringing together research insights into a coherent narrative (Liedtka & Ogilve2011). This helps in understanding the user's perspective and context. By mapping out each step of the user's journey, designers can clearly identify pain points, unmet needs, and emotional highs and lows as can be seen by the images below (Rosinksy et al., 2022). "Moments that matter" is a phrase often used to describe

significant or impactful events in an individual's life or in a specific context, that have a lasting effect and are often memorable due to their emotional, transformational, or pivotal nature that can often influence future behaviors and decisions. They are often characterized by their emotional impact and their ability to create meaningful connections (Heath & Heath 2017). In the journey map, every dip and high point are "moments that matter"- each dip highlighting the pain points that need to be addressed, and every high point being an opportunity to cash in on the 'feeling good' emotion. Figure 2 shows the journey map for students engaged in experiential learning experience; Figure 3 shows the journey map for faculty incorporating experiential learning into his/her curriculum and acting as a liaison between students and corporate clients and finally, Figure 4 shows the journey map from the perspective of a corporate client that gives the project for the students to learn from.

Student: The student journey map reveals critical touchpoints where students encounter significant challenges. For instance, the initial phase of project initiation is marked by a lack of clarity and support, leading to early stress and confusion. The workload management phase shows a peak in stress levels, exacerbated by inadequate resources. Feedback reception points to a gap in timely and actionable feedback, affecting students' ability to improve their work. Reflective practices are underutilized, suggesting a need for more structured reflection opportunities. Addressing these phases can greatly enhance the overall student experience and effectiveness of experiential learning projects.

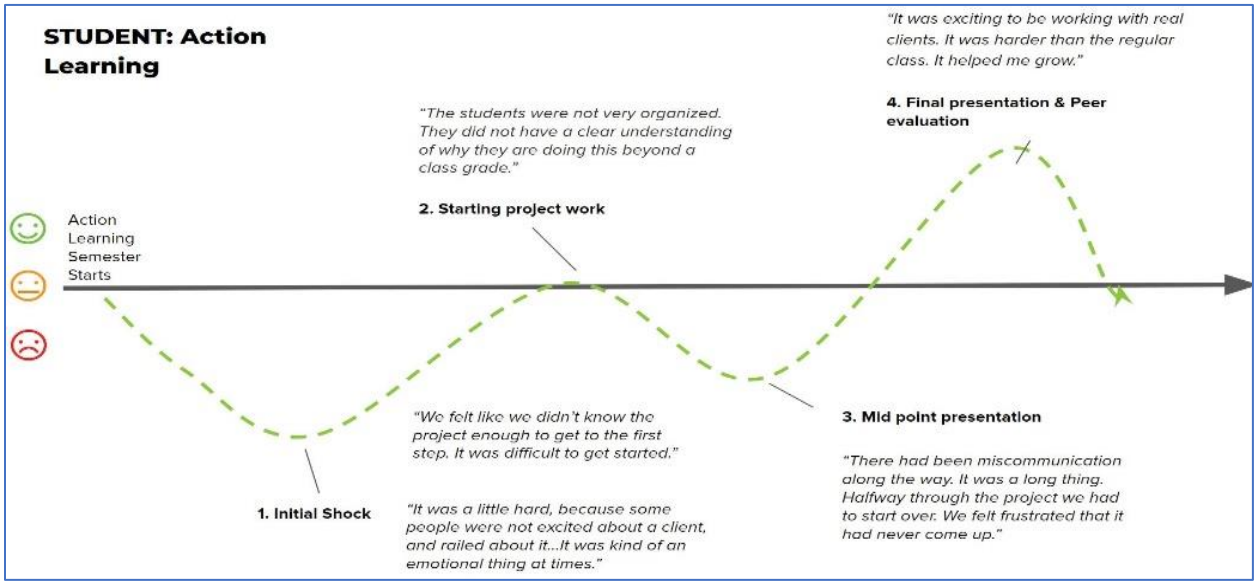

Figure 2: Journey Map of Student

Faculty: The faculty journey map outlines challenges in project setup, including insufficient support and resources. Coordination with corporate clients often reveals gaps in communication and goal alignment, complicating the management process. Supervision of students is affected by the lack of real-time feedback mechanisms and training. Addressing these issues by providing

more support, improving communication channels, and offering targeted training can enhance faculty effectiveness in managing experiential learning projects.

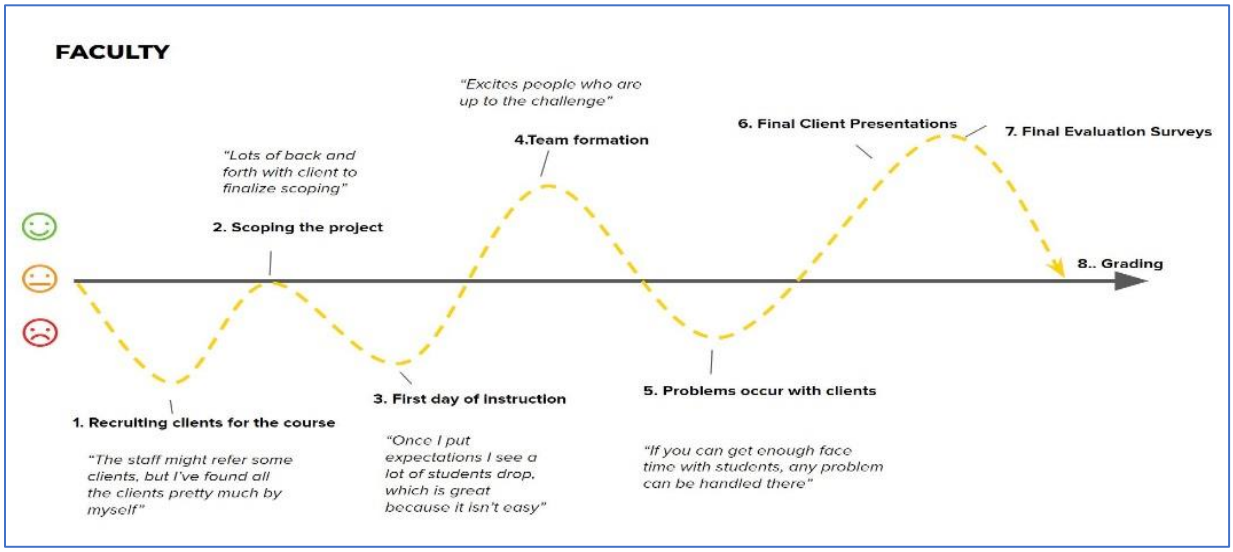

Figure 3: Journey Map of Faculty

Client: The corporate client journey map highlights key phases such as project planning, collaboration with students, and evaluation of deliverables. Issues are evident in the planning phase, where expectations are misaligned, leading to collaboration challenges. The collaboration phase often suffers from communication breakdowns, impacting the quality of deliverables. The evaluation phase reveals concerns about the applicability and impact of student work. Improving these phases can facilitate smoother interactions and better client and student outcomes.

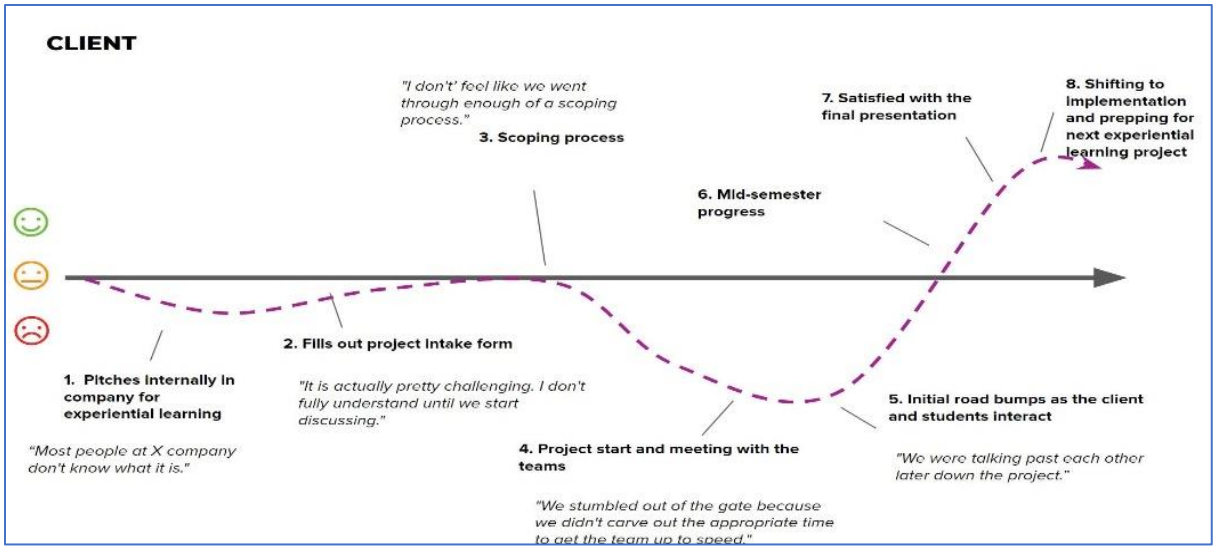

Figure 4: Journey Map of Corporate Client

2. How Might We's: How Might We" (HMW) is a question format used in the Human-Centered Design (HCD) process that frames opportunities in a user-centered and solution-oriented way. It prioritizes user needs and ultimately leads to innovative solutions (IDEO.org). The HMWs should be broad enough to allow for a range of possible solutions without being too vague and be specific enough to provide clear direction and focus on a particular issue or aspect of the problem, and be user-centered, reflecting the needs, desires, and pain points of the users or stakeholders involved. The HMWs we have designed also take inspiration from journey maps and address the high and low points as springboards for innovative solutions.

Client Experience

HMW 1: How might we leverage the client satisfaction at the end of projects?

Rationale: Clients often feel satisfied with the final deliverables and the fresh perspectives students bring. Leveraging this satisfaction can enhance future engagements.

Possible Directions:

- Create post-project reflection sessions where clients share their experiences and feedback with new student teams.
- Develop a client testimonial program highlighting successful projects and encouraging repeat engagements.
- Implement a client loyalty program that offers benefits for long-term partnerships with the business school.

HMW 2: How might we provide opportunities for clients to engage and familiarize themselves with students before jumping into a project?

Rationale: Building rapport between clients and students early on can lead to smoother project execution.

Possible Directions:

- Organize pre-project networking events or informal meet-and-greet sessions.
- Introduce virtual team-building activities to foster early connections.
- Develop an onboarding process that includes initial meetings or workshops for clients and students to align expectations and goals.

Student Experience

HMW 1: How might we best prepare students to learn in agile, fluid environments?

Rationale: Students often struggle with ambiguity and changing project scopes. Preparing them for these conditions can enhance their learning experience.

Possible Directions:

- Incorporate training modules on agile methodologies and project management into the curriculum.
- Provide students with case studies and simulations that involve handling ambiguous situations.
- Establish mentorship programs where students can learn from experienced peers or professionals about managing fluid environments.

HMW 2: How might we build an atmosphere of trust between students, clients, and faculty?

Rationale: Trust is crucial for effective collaboration and communication among all parties involved in experiential learning.

Possible Directions:

- Foster open communication channels and regular student, client, and faculty check-ins.
- Create a safe space for students to voice concerns and ask questions without fear of judgment.
- Implement trust-building exercises and workshops as part of the project kickoff.

HMW 3: How might we create a supportive culture to address stress and burnout?

Rationale: Experiential learning can be stressful, leading to burnout among students. A supportive culture can mitigate these negative effects.

Possible Directions:

- Provide access to mental health resources and stress management workshops.
- Establish peer support groups where students can share experiences and coping strategies.
- Introduce flexible deadlines and workload adjustments to accommodate students' well-being.

Faculty Experience

HMW 1: How might we shield faculty from non-project-related affairs?

Rationale: Faculty often juggle multiple responsibilities, which can detract from their focus on experiential learning projects.

Possible Directions:

- Hire dedicated project managers or coordinators to handle administrative tasks and logistics.
- Implement streamlined processes for client-student communication that minimize faculty involvement in non-essential matters.
- Develop support systems and resources for faculty to manage their workload effectively.

HMW 2: How might we help faculty manage multiple client relationships within one classroom?

Rationale: Faculty often need to balance relationships with several clients simultaneously, which can be challenging.

Possible Directions:

- Use technology platforms to centralize communication and project management, allowing faculty to oversee multiple projects efficiently.
- Offer training sessions for faculty on relationship management and effective communication strategies.
- Create standardized templates and guidelines for managing client interactions and expectations.

HMW 3: How might we bridge the gap between industry and academia?

Rationale: Aligning academic goals with industry needs can enhance the relevance and impact of experiential learning projects.

Possible Directions:

- Facilitate regular industry-academia forums to discuss emerging trends and align curriculum with industry requirements.
- Develop partnerships with industry leaders to co-create course content and experiential learning opportunities.
- Encourage faculty to engage in industry consultancy or sabbaticals to stay updated with current practices and insights.

By developing these "How Might We" questions further, we can generate a wide range of potential solutions that address the needs and pain points of all stakeholders involved in experiential learning. This approach ensures a user-centered, empathetic, and collaborative problem-solving process.

CONCLUSION

Experiential learning is an effective way for students to acquire real-world skills while providing colleges with a valuable means to engage with industry (Fatherlrahman & Kabbar, 2018). This paper leverages a human-centered, empathy-driven framework to uncover the deeper, often unspoken attitudes, behaviors, and motivations of stakeholders involved in experiential learning projects.

Our findings highlight several critical areas that need immediate attention. These include addressing student burnout and stress and narrowing the divide between academia and industry. Importantly, we have filled a gap in the literature by emphasizing the pain points of not only students but also corporate clients and faculty—stakeholders who are often overlooked yet play essential roles in the success of experiential learning.

Business schools traditionally rely on rigid methodologies for planning and managing projects. However, our research indicates that businesses increasingly prefer agile methodologies with flexible scopes, deliverables, and constant feedback for experiential learning projects. To address these challenges and improve the experiential learning process, we formulated several "How Might We" questions that focus on resolving the frustrations and pain points of various stakeholders.

By centering solutions around these insights, we can create more meaningful and impactful experiential learning experiences for students, clients, and faculty alike. This approach enhances the student learning-outcomes and strengthens the partnerships between academia and industry, fostering a more dynamic and collaborative educational environment.

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A MODERN FRAMEWORK FOR LEADING AUTISTIC ADULTS IN THE WORKPLACE

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ABSTRACT

This research addresses the need for adapted leadership frameworks due to the increasing identification of the neurodivergent population, especially those with autism spectrum disorder (ASD). Individuals with High Functioning Autism (HFA) encounter difficulties in social communication (CDC, 2022b), flexibility (Hayward et al., 2019), and sensory sensitivities (Autism Speaks, 2022). Understanding these challenges is crucial for effective leadership. Several leadership styles have been explored for managing autistic adults within this study, however, most demonstrate significant drawbacks that may negatively impact this population. The situational leadership model (Cubero, 2007), rooted in adapting to specific situations and individual needs, holds significant promise to effectively manage autistic adults. This paper emphasizes the necessity for managerial adaptation to embrace the strengths of autistic individuals through a modified situational leadership model which could potentially boost morale, create a sense of community, and maximize the potential of ASD employees in the workplace.

As awareness of the working neurodivergent population grows worldwide, it has become evident that leadership frameworks created for a neurotypical population do not apply for the millions of adults identified with these conditions. Globally, it is currently estimated that one in 100 children will be diagnosed with some form of autism spectrum disorder (ASD), bringing the global population of individuals with ASD to over 80,000,000 people (Zidan et al., 2022). While some of these children will not be able to gain willful employment as they reach adulthood, a large percentage of this population will be staffing businesses across the globe in the future, especially those with High Functioning Autism (HFA). Those seeking to create a high-performance culture, need a greater understanding of how to lead neurodivergent individuals. Doing so helps create clear expectations, fosters a sense of belonging, and allows for greater employee involvement in decision-making and skill development (Owen et al., 2001). Though many managerial frameworks and theories exist to create higher leadership efficacy, little research has been completed on effectively leading this population, especially those that are classified as HFA. Building upon past theoretical constructs and practical managerial wisdom, this study aims to clarify and identify the best leadership style and theory to leading autistic adults. Secondarily, we will explore other models for leading autistic adults.

Meeting organizational and managerial goals is challenging. In academic literature, we have dozens of theories on how to both manage and lead effectively. This theoretical paper canvassed many of the most prominent theories of leadership. Through this research, we will answer the question: what leadership style is most effective for managers overseeing high-functioning autistic employees? In a comparative analysis reviewing the benefits and drawbacks of generally accepted leadership theories, this paper will clarify why situational leadership provides the greatest benefit for both HFA employees and organizational leaders.

With much stigma attached to hiring an adult with ASD, the literature is clear that "image norms about employees with autism may be held by coworkers, managers, and other organizational stakeholders" (Hurley-Hanson et al., 2020, p. 71). Past research has shown that many adults with ASD struggle with employment due to limited post-school services and support options (Bennett & Dukes, 2013; Hedley et al., 2017; Hendricks, 2010). Accepting those with disabilities is a conscious choice and does not come without effort and intention. Many benefits await organizations that employ individuals with HFA. Baldwin et al. (2014) cite visual thinking, systemic information processing, and precise technical abilities like those seen in computer programming as strong qualities. Hendricks (2010) states that these individuals are highly detailed and intensely focused, which results in increased output, low absenteeism, trustworthiness, and reliability. Coetzer (2016) found that individuals with autism regularly have behaviors of ingenuity, are innovative, creative, determined, perseverant, and have an intense concentration on things of their interest. Based on the research of Hayward et al. (2019), employees with HFA generally possess significant intellectual abilities, have a high focus on attention/detail, and are generally highly productive compared to their colleagues without ASD. There is a paucity of research surrounding leadership of autistic adults in the workplace. As such, it can be difficult to understand how to best support them with their diverse set of needs. Given this, leaders need a pragmatic set of tools that is both prescriptive and descriptive in how they should best lead.

LITERATURE REVIEW

Individuals with autism face a series of challenges as they look to contribute meaningfully to an organization. Many deal with a wide range of social and behavioral deficits that make inclusion and conformance to generally understood social rules very difficult (Hendricks, 2010). ASD is a comprehensive diagnosis that encompasses a diverse group of individuals who typically share a common set of developmental disabilities, characterized by distinct traits and characteristics. The term "spectrum" is employed to reflect the wide range of manifestations that can occur, varying from mild to severe (Hendricks, 2010).

ASD, as highlighted by the Center for Disease Control (CDC 2024a), presents significant obstacles in social interaction, communication, and behavior. Although it is acknowledged as a genetic condition, the specific cause remains unidentified. The Diagnostic and Statistical Manual of Mental Disorders (DSM), established by the American Psychiatric Association (n.d.), is the authoritative resource for diagnosing mental disorders in the United States. The most recent edition, the DSM-V-TR, published in 2022, encompasses the revisions made to the diagnosis of ASD in 2013. Previously, the DSM distinguished between Asperger's Syndrome, Autism, and Pervasive Developmental Disorder, all of which were considered high-functioning forms of ASD. However, since the publication of the DSM-V in 2013, these three disorders have been consolidated under the broader diagnosis of ASD (King et al., 2014).

According to the CDC (2022a), within the United States, one in 44 children are on the spectrum of ASD. It is 4.2 times more common in boys (1 in 42) than in girls (1 in 189), currently affecting nearly 5.5 million American adults (Dietz et al., 2020). In 2000, the CDC (2024b) stated that only one in 150 children in the United States were diagnosed with ASD; a decade later, in 2010, that number rose to one in 68. Over the last decade, nearly 500,000 individuals with ASD became adults (Griffiths et al., 2016).

In the past, individuals who exhibited typical intellectual functioning alongside typical characteristics, previously known as Asperger's Syndrome, are now referred to as High Functioning Autistics or having HFA by healthcare professionals. It is important to note that those with HFA do not have an intellectual disability (Baldwin et al., 2014). However, they may experience challenges related to understanding the subtleties of social conversations and relationships (Autism Speaks, 2024; CDC, 2024c, May 16).

The term HFA has recently faced criticism due to its implication that individuals with other forms of ASD are low functioning. Alvares et al. (2020) suggest that intelligence is not necessarily a predictor of functional ability, undermining the distinction between high and low functioning. Nevertheless, for the purpose of this paper, the term HFA will be used to describe this condition, as it has been the standard terminology in research since at least the early 1990s (Ozonoff et al., 1991).

Individuals with HFA often encounter difficulties in understanding the nuances of social conversation, such as the natural flow of communication, the use of sarcasm, interpreting facial expressions, and understanding body language. They may also exhibit generalized characteristics, including narrow and specific interests, a strong preference for routine and uniformity, and significant challenges in adapting to changes in expectations or their environment. Sensitivities to sensory stimuli, encompassing sounds, lights, tastes, textures, and tactile sensations, or a combination thereof, are also common among individuals with HFA (Autism Speaks, 2024; CDC, 2024c, May 16).

Among the notable symptoms of ASD is the presence of atypical eye contact patterns. According to Senju and Johnson (2009), "individuals with ASD often display physiological hyperarousal and withdrawal, leading to a tendency to avoid eye contact" (p. 1206). This behavior is attributed to heightened anxiety or discomfort experienced by individuals with ASD.

CURRENTLY EMPLOYED LEADERSHIP PRACTICES

There are countless management and leadership theories currently being utilized in business today. One thing is clear however, to succeed in leading HFA adults, specific leadership styles showed the greatest amount of effectiveness with this population of adults (Parr & Hunter, 2014). Their research postulated that the impact of leadership is the most beneficial in improving and developing positive work outcomes for HFA employees. In a review of the practical application of leadership for this affected population, there are five types of leadership that seem to be the most prevalent when working with this population: authoritative leadership, transformational leadership, servant leadership, authentic leadership, and situational leadership.

Authoritative Leadership

Authoritative leadership is a specific style where a leader exerts a high level of control over meeting objectives, decision-making, strategic planning and task execution (Radu-Ioan, 2010). Furthermore, employers who utilize this leadership style often make decisions without employee input nor participation (Bogathy & Ilin, 2004), When working with autistic adults, this leadership style can provide potential benefits, but there are also potential drawbacks (See Table 1).

Table 1: Authoritative Leadership: Benefits and Drawbacks for ASD Employees

Benefits		**Drawbacks**	
Specific expectations (Scott, et al, 2015)	This style allows ASD employees to strive in a well-structured environment	Stress (Tierney, et al, 2016)	High-pressure from authoritative leaders can lead to increased stress and anxiety, negatively affecting performance.
Managerial Consistency (Markel & Elia, 2016)	Provides a sense of stability for autistic adults who may struggle with changes to their routines	Communication Issues (Markel & Elia, 2016)	Employees may be confused or misunderstand direction, but will most likely not approach this type of leader to seek clarification
Clear Direction (Jameson, 2022)	Clear direction may reduce anxiety of deciding	Limited Autonomy (Scott et al., 2019)	ASD employees will not be allowed to contribute to the decision-making process, which could have a negative impact on their potential growth.
Efficient decisions (Hurley-Hanson et al., 2020)	Eliminates the need for uncertainty or ambiguity, thus relieving the employee from needing to decide	Rigidity (Hurley-Hanson et al., 2020)	The total control of this leadership style does not allow for accommodations to the different needs of autistic adults, as it eliminates individualized approaches

Considering the unique needs and characteristics of autistic adults, a more balanced and adaptive leadership style should be employed so that both the organization and the employee can find joint success.

Transformational Leadership

With a high degree of charisma and the promotion of shared vision, transformational leaders focus on increasing group confidence to create growth and personal achievement (Breuer & Szillat, 2019). In other words, if an employee is motivated to achieve, then the entire organization will benefit. In a recent meta-analysis, research indicates that transformational leadership better influenced employees' performance outcomes beyond ethical, authentic, and servant leadership (Hoch, et al., 2016).. When applied to working with autistic adults, this approach also has its fair share benefits and drawbacks (See Table 2).

Table 2: Transformational Leadership: Benefits and Drawbacks for ASD Employees

Benefits		**Drawbacks**	
Positive Org. Culture (Tubío-Fungueiriño et al., 2021)	Creating a positive work environment rooted in trust, collaboration, and open communication can increase ASD employee engagement.	Autonomy (Hayward et al., 2019)	Without clear guidance, the increased autonomy and decision-making opportunities may seem difficult for some ASD employees
Individual Prioritization (Markel & Elia, 2016)	Prioritizing the needs of an individual allows for greater personalization and effective managerial support.	Communication Issues (Chen et al., 2015)	Due to the emphasis of inspiration-based communication, autistic adults who may struggle with verbal and non-verbal communication.
Emphasis on personal growth (Solomon, 2020)	Due to positive modeling, this style can foster a sense of self-improvement and personal empowerment	Meeting Expectations (Scott et al., 2019)	This style sets high expectations which possess a challenge for some autistic individuals to meet thus leading to stress and/or anxiety
Flexibility & Understanding (Hayward et al., 2019)	Demonstrates a high degree of understanding, especially when ASD employees deal with unique challenges in social interactions and communication	Change Management (Hurley-Hanson et al., 2020)	A culture based in change and/or continuous improvement could be difficult for those who thrive on stability and predictability in their work environments.

By integrating these best practices with transformational leadership, leaders can create an environment that fosters the growth and well-being of autistic adults while leveraging their unique strengths and contributions.

Servant Leadership

Servant leadership, contrary to authoritative leadership, is a style that promotes serving and supporting the needs of employees through empathy, concern for employee well-being, empowering subordinates, by taking an altruistic posture (Fatima et al., 2021; Hoch, 2016). Leaders who practice this style often do so for employee growth which yields company success (Breuer & Szillat, 2019). Servant leadership, when applied to working with autistic adults, also possesses both benefits and drawbacks (See Table 3).

Table 3: Servant Leadership: Benefits and Drawbacks for ASD Employees

Benefits		Drawbacks	
Supportive Environment (McMahon et al., 2020)	Creating a safe and trusting environment can promote engagement and a greater sense of well-being.	Setting Boundaries (Jameson, 2022)	A strong individual focus could lead to a lack of independent working time, role confusion, and create unnecessary stress
Focus on the Individual (Jameson, 2022)	Prioritizing the needs and accommodation of an individual allows for greater personalization and effective support.	Team Focus (Hurley-Hanson et al., 2020)	Team members may feel neglected due to the high focus on generating strong team dynamics
Empowerment (Vaughan, 2019)	Greater employee empowerment can allow ASD employees to develop strong self-advocacy skills	Decision Making (Chen et al., 2015)	The need for consensus-building and inclusive decision-making can create frustrations when decisions need to be made in a timely manner
Empathy (Miller-Fox, 2018)	Demonstrates a high degree of understanding, especially when ASD employees deal with unique challenges in social interactions and communication	Managerial Balance (Markel & Elia, 2016)	Difficulties in managing the diverse needs of team members to ensure equitable and fair treatment.

By applying servant leadership with these best practices, leaders can create an inclusive and supportive environment that enables autistic adults to reach their full potential and contribute meaningfully to the team's success. Past research on servant leadership has found that this style promotes more positive employee outcomes when compared to transformational leadership and authentic leadership (Liao et al., 2020). Though there are strong similarities in the benefits of both transformational and servant leadership, the drawbacks seem to cause undue stress, confusion, and anxiety with HFA employees, thus making neither the ideal leadership style to manage HFA adults in the workplace.

Authentic Leadership

Authentic leadership is a leadership style where the manager is keenly self-aware of their abilities, they hold a high emphasis on transparency while all guided by ethical behavior (Fusco et al., 2016). As conceptualized in past research, “authentic leaders are guided by sound moral convictions and act in concordance with their deeply held values. They are keenly aware of their strengths and weaknesses and strive to understand how their leadership impacts others” (Peus et al., 2012, p.332). Since this leadership style is founded on the individual abilities of a leader,

working with HFA adults can prove to be beneficial for both the employee and organization, but also has its fair share of benefits and drawbacks (See Table 4).

Table 4: Authentic Leadership: Benefits and Drawbacks for ASD Employees

Benefits		**Drawbacks**	
Supportive Environment (McMahon et al., 2020)	Creating a safe and trusting environment can promote engagement and a greater sense of well-being.	Processing Differences (Grandin, 1995)	These leaders embrace open and honest discussions, which can be challenging for ASD adults who may process information differently (sensory or cognitive)
Individual Prioritization (Jameson, 2022)	Individual prioritization provides greater personalization and effective support.	Communication Challenges (Chen et al., 2015)	This style embraces social cues and emotion, which may create misunderstandings in autistic adults
Empowerment (Vaughan, 2019)	Greater employee empowerment can allow ASD employees to develop strong self-advocacy skills	Emotional Strain (Morris, et al, 2015)	Emotional expression and the need for connection may lead to emotional overload and increased stress with ASD employees.
Transparency (Hurley-Hanson et al., 2020)	An honest and transparent approach would ensure that ASD employees do not feel that they are being misinformed	Lack of Flexibility (Hurley-Hanson et al., 2020)	Authentic leaders are who they are, thus harnessing a rigid adherence to their values

By combining authentic leadership with these best practices, leaders can establish a supportive and inclusive environment that allows autistic adults to thrive and contribute their unique skills and perspectives to the team.

Situational Leadership

Situational leadership has been previously studied relating to individuals with disabilities previously but there is a paucity of research considering high-functioning autistic individuals in the workplace. Cubero (2007) first theorized an adaptation of situational leadership in a generalized model for individuals with disabilities. Framed contextually for those with either a cognitive impairment or physical disability, Cubero demonstrated how Blanchard and Hersey's model could be adapted to meet their unique needs (2007). While the elements are very similar, high-functioning autistic adults have neither a cognitive impairment nor a physical disability. It is possible that these individuals may have comorbidity issues, but that would not fall under the diagnosis of high-functioning autism. Situational leadership, much as the aforementioned models, has its share of both benefits and drawbacks for this population (Table 5).

Table 5: Situational Leadership: Benefits and Drawbacks for ASD Employees

Benefits		**Drawbacks**	
Tailored Communication and Supervision (Baldwin, et al, 2014)	Allows for adaptable communication styles, which can enhance understanding and engagement for HFA individuals who have specific communication preferences	Inconsistency (Markel & Elia, 2016)	Inconsistent application of situational leadership can lead to confusion about expectations which can be detrimental to HFA employees who often thrive when structured
Development Opportunities (Super, 1957)	Leaders can identify the developmental needs of employees and offer appropriate guidance, aiding professional growth	Overwhelming Leadership (Hurlbutt & Chalmers, 2004)	Shifts in management styles can overwhelm autistic employees, who may prefer consistency
Managerial Flexibility (Schermerhorn, et al, 2014)	This model provides flexibility to help in responding to the varied needs of HFA employees. Leader can determine whether more structure or more freedom is required	Misunderstanding of Needs (Vaughn, 2019)	Leaders may misinterpret the needs of autistic employees, potentially leading to inadequate support or autonomy, which may create frustration

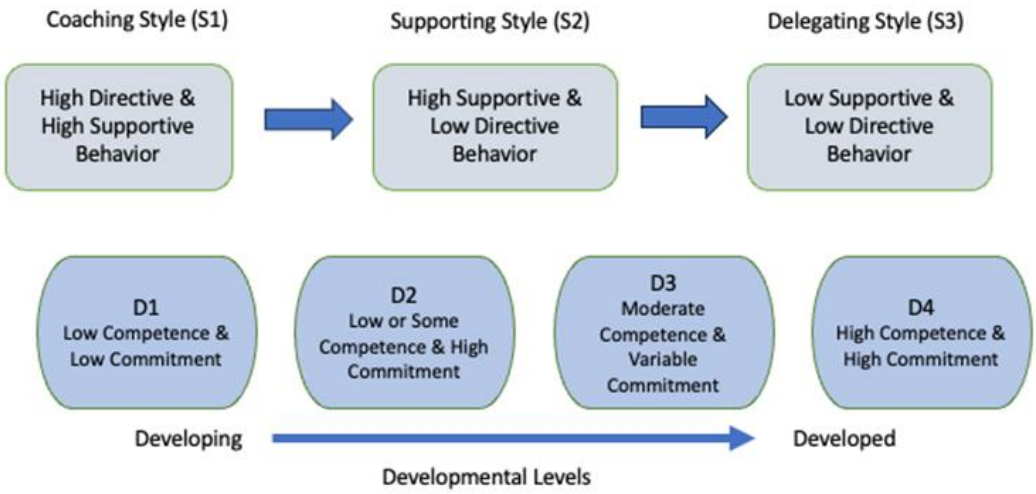
Independence/Autonomy (Hayward, et al, 2014)	This style allows leaders to provide guidance when needed, but step back and allow employees to work independently, which can enhance job satisfaction and performance	Social Processing Mismatch (Vasilescu, 2019)	Reliance on interpersonal dynamics in situational leadership might not align with the social processing styles of some autistic individuals, leading to misunderstandings

Unlike the other major leadership styles described however, situational leadership appears to maximize benefits for HFA employees, while minimizing many of the severe and unwanted drawbacks that create stress, anxiety, ambiguity, and lack of understanding which lower employee morale and organizational productivity. Though there is a mild propensity for misunderstandings, confusion, and a sense of being overwhelmed when situational leadership is misapplied, the benefits of this style seem to clearly outweigh the plausible drawbacks. When consistently applied within the workforce, situational leadership seems to greatly benefit this population of employees. Based on past literature, the authors assert that a modified version of situational leadership is the best theory to apply when leading autistic adults.

MODEL OVERVIEW

Adapted from Blanchard and Hersey's Situational leadership theory, this simplified version customized for the management of autistic adults condenses the original four phases of leadership styles into three. At the crux of the model is the understanding that different situations require different leadership styles (Northouse, 2018). Given the unique demands that come with leading autistic adults, a flexible framework is required. We propose a three-phase style that starts with coaching, then progresses to supporting and finally on to delegating (See Figure 1). In each style there is a prescribed behavior necessary to best support the individual with HFA.

Figure 1: A Modern Framework for Managing Autistic Adults



Note: This modified framework, specifically for ASD adults in the workforce, is based on prior work of Cubero (2007) which was designed for a neurotypical population.

The first phase (S1) is called the coaching phase. In the coaching phase the manager applies a high degree of both directive and supportive behavior. Supportive behaviors help those individuals develop a level of comfort and rapport within their team (Northouse, 2018). They also provide a high level of emotional and social support that autistic individuals very much need. Directive behaviors help the individual by giving them specific goals, timelines, and directions to accomplish their tasks. Directive behaviors are one-way communications whereas supportive behaviors are two-way forms of communications. In Blanchard and Hersey's original model (Hersey et al., 1979), the first phase was referred to as the directing style. This employed a high level of direction and a low level of supporting behavior. For individuals with autism that are new to an organization, a lack of connection and support would lead them to fail. On the job training, long term support, supervisory and co-worker support have all been shown as vital to the successful employment of an individual with autism (Hendricks, 2010). It would not be appropriate, nor would it help the individual with autism if the manager started in a place without this level of support.

In the second phase (S2), the manager applies the supporting style of leadership. In this phase, the manager continues to apply a high degree of supportive behaviors but lowers their degree of directive behavior. It is theorized that this phase is useful for individuals who have gained a higher degree of task orientation, familiarity, and role mastery. According to Northouse (2018), the leader not only uses goals but also leverages the individuals' skills to help achieve those goals. This includes activities like asking for input, listening, praising, and giving feedback. This phase provides an opportunity for the leader to demonstrate how much they value the employee by recognizing the gifts and skill sets the individual brings to the organization. This helps deepen rapport and further builds employee loyalty. Furthermore, autistic individuals often struggle with ambiguity (Ellestad et al., 2023). Through proactive conversation, leaders can engage with the

neurodivergent employee to further clarify the goals, tasks, and requirements at hand. Given the social and behavioral deficits that individuals with autism face it is theorized that the starting place for each manager should be in S1 or S2.

The third and final leadership phase (S3) is the delegating style. This requires less supportive and directive behavior on the part of the manager. In this phase, the individual has fully established themselves in their role, group, and job competency. It can be said that this is the ultimate goal for all neurodivergent employees, however, that may not be physically possible for some individuals. The most realistic goal is to move these individuals to their highest degree of independence possible for them. This supports other research that says employment is good for mental, emotional, and societal aspects (Baldwin et al., 2014; Hendricks, 2010). It is highly likely that given the needs of an HFA the manager will stay in the S1 and S2 given the ongoing need for behavioral support.

Ongoing Development

Central to situational leadership theory is the concept that individuals are moving horizontally along a developmental scale (Hersey & Blanchard, 1997). Before a manager can apply a leadership style, they first need to understand the nature of the situation and the developmental orientation of the individual. To do so, managers need to ask questions like: What are the individuals being asked to do? How complex is the issue at hand? Do they have the desire to complete the task at hand? Answering these questions allows the manager to identify where the individual is on the developmental scale.

New individuals are analyzed by looking at their level of commitment as well level of competency. The model asserts that an individual needs both the skills to complete the task but also to maintain a positive attitude regarding the task (Blanchard et al., 1993). An individual with a low level of commitment and little or no skills is at the lowest level of development (D1). This is where the manager has the most work to do to encourage, build up, and train the individual. Typically, individuals who fall into the D1 category will also require an S1 leadership style. When an individual has a high level of commitment or positive attitude towards the task but little to no skills, that individual falls into the D2 category. The individual is further along on the developmental continuum because they are closer to the ideal development level.

The third development level (D3) occurs when the individual has gained some skills and has either a high or low commitment to complete the task. Given that the individual has progressed in their skills, they may need less direction from the manager but still require behavioral support. This is likely to be where most high functioning autistic individuals find themselves. Managers will still need to employ a high degree of behavioral support with a mixed level of direction. Therefore, the supporting leadership style would fit best. An employee is fully developed (D4) when they have both the required skills to complete their task but also a positive attitude towards the job at hand. In such scenarios, the manager could move to a delegating style of leadership by employing a lower level of supportive behaviors and a lower level of directive behaviors. This is for individuals who have become well established in their role and who understand the required norms and context in which the work operates in. For individuals with ASD, this will take some time to achieve.

POTENTIAL CHALLENGES

As Northouse (2018) describes, one of the criticisms of situational leadership is that there is little direction provided to assist leaders and managers in categorizing employees to be directed into a given phase. This leaves it purely to managerial discretion which would be accurate or inaccurate depending on their level of familiarity with the individual. This cannot be done on day one of a new employee's tenure. In order to be effective, managers and leaders need to get to know each individual person, their gifts, abilities, strengths, and deficits. Only then can the manager make such a judgment. Additionally, judgments will vary depending on the manager or leader. This makes consistency much harder in larger organizations with many teams. Organizations need to create their own diagnostic criteria and then educate leaders on how to perform this analysis to ensure consistency.

A potential dilemma occurs when employing autistic adults. As Ellestad et al. (2023) points out, autistic individuals are hesitant to openly state they have a disability for fear of discrimination. Many choose to mask their symptoms and needs. This poses challenges for leaders who are trying to properly assess what needs the individual has. If the leader cannot assess the individual's level of commitment and competence accurately, the leader cannot assign the appropriate leadership style. Brodey (2018) says that leaders should hold crucial conversations with their employees and in doing so, put a heavy emphasis on empathy and the individual's abilities, not disabilities. These topics are generally taboo in social conversation. It takes psychological safety for all parties to be willing to discuss it (Grenny et al, 2021).

A final challenge to situational leadership that is worth consideration is its focus on the individual (Northouse, 2018). The authors of this paper encourage all leaders to encourage, support, and develop a relationship with each employee on a one to one level. However, given the scope of some large corporations and team sizes, this may not be possible. If a leader or manager is not able to have a direct relationship and properly assess the individual outside of the group, they will not be successful in implementing this modified situational leadership framework. In order for this model to be successful in practice, consistent situational leadership must be exercised.

DISCUSSION

This model provides several valuable strengths as it applies to autistic individuals in the workplace. By utilizing a framework rooted in situational leadership we can summarize the major benefits from authoritative, servant, transformational, and authentic leadership, while mitigating the potentially harmful drawbacks. Though these other leadership theories pose significant value for both practitioners and theorists are like, when working with a neurodivergent population like those with HFA these leadership styles have been shown to cause undue stress, anxiety, confusion, and the potential for employee disengagement (Chen et al., 2015; Jameson, 2022; Markel & Elia, 2016; Morris et al, 2015). By employing this situational leadership framework, the upside potential will boost employee morale, create a sense of community within the workplace, trust in the organization, all while allowing ASD adults to maximize their individual potential which benefits both the organization and the individuals alike. Failure to embrace this model, or a model similar to it when working with HFA adults, will only continue the growing cycle of low

unemployment/underemployment, inadequate support programs, and a failure to embrace inclusion in the workplace (Hurley-Hanson et al., 2020).

As a theoretical framework this idea is still limited as it does require implementation within an organization to show practical validity. However, based on a comprehensive review of literature on both leadership and organizational behavior, when employing HFA adults, it appears that the benefit of situational leadership far surpasses any potential drawbacks. Additionally, by taking a strong focus on the individual person during a very specific situation, we postulate that the efficacy of this model seems to have significantly more upside potential than traditional leadership models that are currently used in organizations worldwide. As the HFA population grows, there will need to be a major shift in managerial attitudes, thinking, and operational frameworks to adequately position organizations to embrace these individuals and allow them to operate as successful members of an organization. Only when practitioners in the world of business are willing to change their previously held beliefs on leadership, can this model be implemented, and its successes be recorded. We urge future researchers to take on this challenge to more properly prepare business leaders and managers to embrace the diversity and uniqueness of this highly beneficial population.

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STUDENTS ENGAGING IN A PEER FEEDBACK PROCESS ADVANCE THEIR WRITING SKILLS AND HEIGHTEN THEIR PROFESSIONALISM

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ABSTRACT

This study explores the outcomes of peer feedback, a formative assessment method, in an undergraduate business communication course. Eighty students from four semesters of a course titled Effective Business Communication offered their views, via survey responses, of their experiences and takeaways after engaging in a peer feedback process. Survey results indicate that students who engaged in peer feedback reported improved learning and written communication skills. The outcome of engaging in a peer feedback process is important as heightened communication skill levels may better situate graduates for employment and graduate school.

INTRODUCTION

Employer respondents to the National Association of Colleges and Employers (NACE) survey rated the 2024 job market slightly less favorably for new college graduates than employers who rated the 2023 job outlook (NACE, 2022; NACE 2023). Still, employers indicated the job market is good for new college graduates. Within the job market, job modality continues to be varied. Despite a slight downward trend for hiring remote workers, hybrid and remote workplace modalities appear to be prevalent with 9% of jobs in 2024 expected to be fully remote and 48% expected to be hybrid. Table 1 shows the entry-level hiring predictions per workplace modality.

Table 1: Entry-level hiring predictions per workplace modality

	Job Outlook for **Remote Work**	Job Outlook for **Hybrid Work**	Job Outlook for **Full In-Person Work**
2024	9%	48%	43%
2023	10%	48%	42%
2022	18%	40%	42%

(NACE, 2022; NACE 2023)

Among many needed skills in remote and hybrid working environments, effective writing is a critical skill (Dhawan, 2021; Koncz & Gray, 2022). Managers' recognition that business message competency is an essential skill is not new (Conrad & Newberry, 2011). According to the NACE (2023) report, NACE survey respondents confirm the continued focus on communication skills for new hires. Additionally, regardless of work modality, the weight of candidates' skills and competencies in the hiring process is increasing as the weight of GPA in the hiring process is diminishing (NACE, 2023). The evidence lies in the NACE 2024 Job Outlook with employers rating the importance of communication skills at 95.5%, the highest among all career readiness skill categories (NACE, 2023). Further, NACE employer respondents rated the importance of communication competencies at 4.55 which is high on a scale of 1 through 5 for level of importance. That corresponds to what Conrad and Newberry (2011) contend: to increase employability in all types of job roles, and specifically in roles where communication occurs asynchronously, new college graduates must develop and demonstrate effective communication skills. According to the NACE (2023) survey, employers look for communication skill competency when reviewing resumes.

A business professional's competence and credibility, a business's success, and the elements of accuracy and trust hinge on communication clarity. What is troublesome is that employers deem new college graduates deficient in the career readiness competency category of communication (Baird & Parayitam, 2019; NACE, 2023). Employers responding to the most recent NACE survey rated the communication skill proficiency of recent college graduates at 55.2%. Moreover, their ranking of communication skill proficiency was fifth out of eight skill categories with a rating of 3.62 out of 5, indicating the graduates' communication skill competency falls between "somewhat" to "very proficient", and lower compared to many other skill categories. With the growing reliance on digital communication channels, which are prominently used in all work modalities, proofreading and pride in the clarity and format of written business messages are essential (Dhawan, 2021).

The purpose of a 200-level required Business Administration program course titled Effective Business Communication at a small private liberal arts university is to elevate business students' communication proficiency. The Business Administration program's mission is to equip an engaged and diverse community of learners with business skills to become ethical and successful leaders in an interconnected business world. The program has approximately 200 mostly traditional college students in a university of about 2,600 students. The crux of the Business Administration program's intended student learning outcomes is that students will acquire and apply business knowledge and skills with an awareness of organizational, situational, and global contexts and ethics. One of the program's intended student learning outcomes is that students will develop effective communication skills including research and writing skills to allow them to identify, analyze, apply, and communicate relevant information for decision-making. The Effective Business Communication course is writing intensive, and the course description reveals that the course is a study of the analysis and practical application of effective communication in the business environment. The course description also reveals that the course develops and reinforces students' written, oral, and interpersonal communication skills necessary in a diverse and technological culture. Two of the course learning objectives align with the program's intended student learning outcomes:

1. By the end of the course, students will have learned to identify the style, tone, and mode of a message with respect to content and audience.
2. By the end of the course, students will experience developing and reinforcing their written, oral, and electronic communication skills through significant practical application.

AIM OF THE STUDY

The purpose of this study was to explore, from a student's perspective, how they perceived they were impacted by engaging in a peer feedback process during their Effective Business Communication course. Thus, survey data from Effective Business Communication course students over four semesters were examined. This study contributes to the teaching and learning literature base and illuminates the impact that peer feedback can have on elevated learning outcomes and enhancement of students' skills. For educators, this study's conclusions demonstrate the value of the peer feedback process. The refined research purpose was to explore if engaging in a peer feedback process is beneficial for student learning of course concepts and elevation of writing skills. The upcoming sections of this paper begin with an overview of formative assessment and peer feedback that underscores the opportunity to explore the value of peer feedback for undergraduate business students. Included in the introduction are descriptions of the course writing tasks, the structure of the peer feedback process that was used, and how the students were prepared to engage in the peer feedback process. Next is the study's framework, research questions, methodology, sample, and data collection. The paper ends with the study's results, discussion, and conclusion.

INTRODUCTION TO FORMATIVE ASSESSMENT AND PEER FEEDBACK

Based on an extensive review of literature on formative evaluation, formative assessment, summative evaluation, and summative assessment, beginning with Black and Wiliam's 1998 seminal work on formative assessment, Dunn and Mulvenon (2009), redefined formative assessment as "assessments designed to monitor student progress during the learning process." (p. 3). According to Black and Wiliam (1998), student achievement is realized when formative assessments are employed. Black and Wiliam also connected social learning to formative assessments. According to Dunn and Mulvenon (2009), ongoing research regularly posits that formative assessment is an exemplary method for improving student performance. However, they question Black and Wiliam's stance that formative assessment most benefits lower-performing students.

Peer feedback is an engaging learning activity (Simonsmeier et al., 2020) and a regular method of formative assessment for writing classes (Han & Xu, 2020). During a peer feedback process, students assume both examiner and examinee roles. For feedback to be effective, Wiggins (2012) highlights the need for goal-related and tangible feedback that is transparent, just-in-time, and ongoing. While providing peer feedback, students desire to feel competent and safe and simultaneously have confidence in the abilities of their peer evaluators (Kerman et al., 2022). Students significantly benefit from peer feedback when their instructor guides them through the sense-making of the feedback (Han & Xu, 2020). Additionally, when students appreciate peer feedback and make judgments about the feedback, their learning is positively impacted, and they are motivated to make improvements in their content and writing.

Students in the Effective Business Communication course were assigned writing tasks on several topics with instructions to apply business writing techniques and formats that were taught in class, such as:

- Accuracy of content
- Clarity of writing, via inclusion of specifics and use of familiar words and active voice
- Concise writing by eliminating wordiness, cliches, empty phrases, and redundancy, and controlling sentence and paragraph lengths
- Navigational design to improve ease of reading by incorporating headings, font styles, white space, and bulleted or numbered lists

After completing the assigned writing tasks, the students entered a peer feedback process. They were randomly and blindly assigned to review the work of up to three classmates. All parties in the process remained anonymous. During the peer reviews, students used a rubric with specific categories related to content, effective writing, and document formatting. The last step in the peer feedback process was that students reviewed the feedback they received from their peers which they used to prepare a reflective report.

RESEARCH QUESTIONS

1. How helpful to students is their engagement in a peer feedback process for improving their writing skills?
    1a. What aspects of writing skills do students experience improvement after engaging in a peer feedback process?

2. How helpful is a peer feedback process for improving students' comprehension of course concepts?

METHOD AND DESIGN

Students' perceptions after participating in a peer feedback process were explored by surveying students enrolled in a course titled Effective Business Communication. The course description leads with: *The ability to communicate effectively is ranked as one of the most important skills needed by employers*. The crux of the course is to develop and reinforce, through significant practical application, students' written, oral, and interpersonal communication skills necessary in a diverse and technological culture.

Students completed a voluntary survey (see Appendix A) at the end of the semester in which they engaged in peer feedback as part of the course. Surveying occurred in four consecutive academic semesters (Fall 2022, Spring 2023, Fall 2023, and Spring 2024). The study enabled the analysis of students' usage perspectives. The researcher and participating students of this study are from an undergraduate business communication course within a Bachelor of Science in Business Administration program at a small private university.

This study's participants engaged in a multi-step peer feedback process throughout the semester they were enrolled in the business communication course. The feedback process spanned four assignments. The students' first three writing assignments were essays:

1. Explaining the appearance of and demonstrating the application of the American Psychological Association professional paper formatting.
2. Illuminating the importance of nonverbal body language
3. Creating/Crafting Effective Business Messages

The final writing task entailed developing two business messages based on business scenarios.

The instructor trained the students to use the peer feedback rubric (see Appendix B), and students were encouraged to provide motivating feedback, as the goal was improvement via the notification of content and writing issues. The training occurred in class via instructor demonstration, and the students engaged in a practice peer review. Regarding providing motivating comments, the students were encouraged to couple positive comments with constructive critiques so that the peers being evaluated received validation on aspects they performed well. The peer feedback occurred online via an app called Kritik, a peer-to-peer interactive learning platform (Kritik Education, 2024).

SAMPLE AND DATA COLLECTION

Within a span of four consecutive academic semesters (Fall 2022, Spring 2023, Fall 2023, and Spring 2024), 90 students enrolled in a face-to-face course titled Effective Business Communication were asked to respond to a survey regarding their experience with a peer feedback process they engaged in during the course. Participation in the peer feedback process was a course requirement. Survey participation was voluntary, and responses were anonymous. Almost 89% of the students (80 of the 90 enrolled students) responded. Course enrollment and survey participation details are included in Table 2.

Table 2: Course Enrollment and Survey Participation

Semester	**Face-to-Face Course Enrollment**	**Students Completing Survey**	**Percentage of Enrolled Students Completing Survey**
Fall 2022	17	15	88.2%
Spring 2023	21	18	85.7%
Fall 2023	27	22	81.4%
Spring 2024	25	25	100%
Total	**90**	**80**	**88.9%**

RESULTS AND DISCUSSION

Peer Feedback Elevates Concept Understanding

Concurrent with a mixed methods study showing that collaborative learning via peer feedback had a significant positive effect on students' conceptual knowledge (Tan et al., 2023), this study's student respondents indicated that the peer feedback process they engaged in helped increase their understanding of course concepts. On a five-point helpfulness scale with the high end representing extremely helpful, 58.75% of this study's respondents indicated the task of critiquing classmates' work for understanding course concepts was extremely helpful or very helpful. Another 25% responded that the task was moderately helpful for understanding course concepts. See Table 3 for the results.

In addition to providing feedback to peers, students were required to review the feedback they received from their peers and complete a reflection assignment on the feedback they received. When asked about the task of reviewing and reflecting on the feedback they received from their peers, 45% reported that the activity was extremely helpful or very helpful for understanding the course concepts. See Table 4 for full results. It appears the task of providing feedback to peers versus reviewing feedback received was more beneficial to students for their content learning.

Table 3

How helpful was the task of critiquing classmates' work for understanding course concepts?

Extremely Helpful	8.75%
Very Helpful	50%
Moderately Helpful	25%

Slightly Helpful	13.75%
Not Helpful at All	2.5%

Table 4

How helpful was the review of feedback from your peers for understanding course concepts?

Extremely Helpful	10%
Very Helpful	35%
Moderately Helpful	32.5%
Slightly Helpful	20%
Not Helpful at All	2.5%

Peer Feedback Improves Writing Skills

A peer feedback activity allows students to feel supported as they engage in the learning processes of writing and revising (Han & Xu, 2020). The results of this study confirmed Keskin's (2022) findings that students produced better quality writing after receiving peer feedback. Students in this study perceived that their writing skills improved when they provided feedback to peers and reviewed and reflected on the feedback they received from their peers. Table 5 summarizes the results of the survey on the helpfulness of writing skill improvement due to critiquing classmates' work. On a five-point helpfulness scale, 55.66% of this study's respondents perceived the task of critiquing classmates' work as extremely helpful or very helpful in improving their writing skills. Another 26.66% perceived the task was moderately helpful in improving their writing skills.

Similarly, as depicted in Table 6, 52.5% of respondents revealed that the portion of the feedback process for which they reviewed and reflected on the feedback they received from their peers also elevated their writing skills. These results aligned with Keskin's (2022) theory that writing improvement after peer feedback is linked to collaborative learning theory.

Table 5

How helpful was the task of critiquing classmates' work for improving your writing skills?

Extremely Helpful	12.66%
Very Helpful	43%
Moderately Helpful	26.66%
Slightly Helpful	13.92%
Not Helpful at All	3.79%

Table 6

How helpful was the review of feedback from your peers for improving your writing?

Extremely Helpful	11.25%
Very Helpful	41.25%
Moderately Helpful	23.75%
Slightly Helpful	20%
Not Helpful at All	5%

Study respondents also revealed the specific aspects of their writing that improved because of engaging in the peer feedback process in their business communication course. Respondents' choices to consider for the aspects they improved and percentages of respondents who indicated improvement in the various available aspects appear in Table 7.

Overall clarity of content led the way, selected by 75% of the respondents, for aspects students declared they improved by participating in the peer feedback process. More specifically and related to content clarity, respondents revealed they improved their sentence structure (30%) and content organization (20%). Clear, concise, and accurate information will aid in the achievement of shared meaning within the communication process (Cardon, 2024).

After content clarity, 62.5% of the respondents indicated they improved in the completeness of their content. Providing complete information will improve communication efficiency and productivity (Cardon, 2024). A small percentage of this study's respondents (16.5%) recognized their need and gained knowledge of professional document formatting which is essential for the professionalism of business communicators (Cardon, 2024; Dhawan, 2021).

Table 7

Which specific aspects of your writing improved as a result of using Kritik? Check all that apply.

Clarity of Content	75%
Completeness of Content	62.5%
Sentence Structure	30%
Content Organization	20%
Format of Documents	16.25%
Phrasing	2.5%
Punctuation	2.5%
Spelling	2.5%
Word Choice	2.5%
No Improvement	10%

Overall, when asked about improvement in one or more aspects of their writing after engaging in the peer feedback process, 90% noted that to be the case. In a follow-up question about how helpful engaging in the peer feedback process would be for students when they prepared writing going forward, 46.25% of respondents indicated their peer feedback process engagement would be "extremely" or "very helpful" and another 36.25% indicated it would be moderately helpful.

Respondents had the opportunity to contribute qualitative comments about their overall experience with the peer feedback process. Relating to the topic of writing improvement, the theme of helpfulness was prevalent, confirming the students' responses to the multiple-choice survey questions. A sample of students' comments noting their view of peer feedback process helpfulness includes:

"T*he feedback helped my writing as the semester progressed."*

"I felt some of the feedback was helpful and then some of it was not as helpful. I have improved my writing overall."

"This experience has given me many skills that have greatly improved my writing."

"I learned things from my peers' feedback that I will use when writing future assignments."

Peer Feedback Participation Provides Awareness and Foundation for Future Success

Students added qualitative comments on how engaging in the peer feedback process would help them in the future. What surprised most students about the feedback they received included the overall helpfulness of the feedback, identification of mistakes they had not realized they made, and the efforts of some students. The facet of helpfulness of feedback is similar to one construct of social learning from Black and Wiliam (1998): students who understand something can explain their understanding to others.

The main theme from respondents' qualitative comments was **awareness**, supported by this sample of student comments:

"It forces me to think of what others may suggest in my writing and allows me to be more thoughtful during the review process."

"The feedback and evaluation helped me notice what I need to work on."

"It highlighted my weak areas. I can now use that feedback to remember my weak areas and focus in those areas."

"This is useful because when we give feedback, we get to see other people's "mistakes" and consequently reflect on whether or not we're making that mistake in our own assignments."

While small percentages of students selected punctuation (2.5%), spelling (2.5%), word choice (2.5%), and phrasing (2.5%) when they self-selected aspects of their improvement (See Table 6), subthemes of awareness included recognizing the importance of accuracy in grammar and writing mechanics. The following collection of student comments reflects respondents' awareness of grammar and writing mechanics issues:

"This will help me to always double-check grammar, punctuation, spelling, etc."

"I will think of grammar, spelling, concept, etc. as a checklist."

"I will be more aware of my punctuation and grammar, which is something I struggled with before."

"I had made more punctuation errors than I previously thought."

Students Were Motivated by the Peer Reviews They Received

Nearly 67% of the surveyed students rated the motivation level of the reviews they provided as highly motivating or very motivating. The remaining 33% viewed the feedback received as moderately motivating. No respondent indicated feedback had no level of motivation. Qualitative comments confirmed the motivation factor of peer feedback, corresponding to Han and Xu's (2020) assertion that appreciation of peer feedback is motivating:

> *"I was surprised by the variety of feedback that I would receive. Every time it was different; however, the feedback that was provided was always encouraging and helpful."*
>
> *"I was surprised at the amount of effort people put in to review my work. It made me feel like what they were saying was true and I should consider it."*
>
> *"I was impressed by how helpful the feedback was. Many of my peers noticed things that I would not regularly look for or think of!"*
>
> *"People were very specific which helped a lot."*
>
> *"My writing was great and well put together. I was never really a good writer, so I struggled with papers. After seeing all of the positive feedback, I was motivated enough to where I told myself my writing might not be that bad."*

Peer Feedback Experience Will Extend to Future Writing

This study demonstrated that when students engage in a peer feedback process they will benefit when performing similar tasks in the future. Study respondents offered these, and similar comments related to the long-term impacts of their involvement in a peer feedback process:

> *"I will learn to apply the methods that I learned from my classmates and make sure to look for new things that I would not typically think of before. I will also attempt to reread my paper from the audience's perspective."*
>
> *"I am very conscious of the mistakes that I have made continuously and now I can try to continue to improve."*
>
> *"I learned things from my peers' feedback that I will use when writing future assignments."*

CONCLUSION

Employers rate new college graduates' communication skill proficiency level strikingly lower than career readiness communication skill importance. Further, communication skill levels can benefit employees and organizations (Conrad & Newberry, 2011). Thus, improving students'

writing skills remains essential in business education to heighten graduates' employability and graduate school preparedness. This study aimed to discover the helpfulness of a peer feedback process for improving students' writing skills and comprehension and mastery of content in a business communication course in a BS in Business Administration program at a small private university. Results indicate that a peer feedback process used in the business writing course elevates students' writing and content understanding competencies. In terms of writing, the peer feedback process studied for this paper showed students became aware of and noted improvements in content clarity, content organization, and various aspects of grammar and writing mechanics. This study's results concur with Dunn and Mulvenon (2009) position that formative assessments elevate educational outcomes. Thus, the Business Administration program is investigating additional uses of peer feedback in their undergraduate and graduate programs to improve students' writing skills and content comprehension.

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APPENDIX A

Kritik Evaluation

How difficult or easy was Kritik to use?

- Very difficult to use
- Not so easy to use
- Somewhat easy to use
- Easy to use
- Very easy to use

In what way(s) was Kritik easy or difficult for you to use?

How helpful was the task of critiquing classmates' work **for understanding course concepts**?

- Not at all helpful
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

How helpful was the task of critiquing classmates' work **for improving your writing skills**?

- Not at all helpful
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

How helpful was the review of feedback from your peers **for understanding course concepts**?

- Not at all helpful
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

How helpful was the review of feedback from your peers **for improving your writing**?

- Not at all helpful
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

How motivating was the feedback you received from your peers?

- Not at all motivating
- Slightly motivating
- Moderately motivating
- Very motivating
- Highly motivating

How motivating do you perceive was the feedback you provided to your peers?

- Not at all motivating
- Slightly motivating
- Moderately motivating
- Very motivating
- Highly motivating

Which specific aspects of your writing improved as a result of using Kritik? Check all that apply.

- Spelling
- Punctuation
- Capitalization
- Abbreviations
- Phrasing
- Word Choice Sentence structure (writing complete sentences, identification of run-on sentences or sentence fragments)
- Content Organization
- Clarity of Content
- Completeness of Content
- Format of Documents
- None

Which specific aspect of your writing improved THE MOST as result of using Kritik?

- Spelling
- Punctuation
- Capitalization
- Abbreviations
- Phrasing
- Word Choice Sentence structure (writing complete sentences, identification of run-on sentences or sentence fragments)
- Content Organization
- Clarity of Content
- Completeness of Content
- Format of Documents
- None

Which is the second most improved aspect of your writing as result of using Kritik?

- Spelling
- Punctuation
- Capitalization
- Abbreviations
- Phrasing
- Word Choice Sentence structure (writing complete sentences, identification of run-on sentences or sentence fragments)
- Content Organization
- Clarity of Content
- Completeness of Content
- Format of Documents
- None

Which is the third most improved aspect of your writing as result of using Kritik?

- Spelling
- Punctuation
- Capitalization
- Abbreviations
- Phrasing
- Word Choice Sentence structure (writing complete sentences, identification of run-on sentences or sentence fragments)
- Content Organization
- Clarity of Content
- Completeness of Content
- Format of Documents
- None

How comfortable were you with providing peer evaluations?

- Not at all comfortable
- Slightly comfortable
- Moderately comfortable
- Very comfortable
- Extremely comfortable

To what degree did your comfort level giving peer feedback increase as the semester progressed?

- Comfort level did not increase at all
- Comfort level increased slightly
- Comfort level moderately increased
- Comfort level notably increased
- Comfort level significantly increased

What surprised you the most about the feedback you received from your peers?

How helpful will your learning via Kritik in BA 211 be when you complete writing assignments for future classes?
Not at all helpful
- Slightly helpful
- Moderately helpful
- Very helpful
- Extremely helpful

Explain how using Kritik will help you with your writing on future assignments.

Would you recommend this app for other writing courses?
- Yes
- No
- Maybe

Explain why you would or would not, or maybe, recommend the app for other writing courses?

APPENDIX B

Sample of Peer Review Rubric Used by Students

Body Language Essay Rubric

	Level 0	Level 1	Level 2	Level 3	Weight
	Level 0	**Level 1**	**Level 2**	**Level 3**	
Clarity of Thoughts	Yes	No			
Concept Understanding	Evidence of understanding of the aspect of body language as a component of communication was insufficient.	Essay includes limited demonstration of understanding that body language is an important facet of communication.	Demonstrates complete understanding of important concepts of body language but leaves some parts out	Full and accurate explanation of body language as a component of communication was provided	2 pts
Organization	Essay is unorganized and incomplete. Introduction, body and/or conclusion are missing/unclear	Essay is missing important parts that makes it confusing for the reader	Essay is complete. Missing minimal information	Essay is complete. With an excellent introduction, body and conclusion present	1 pt
Grammar	The essay has many grammatical and mechanical errors that makes it difficult to understand	The essay includes several grammatical errors that causes distraction in understanding the essay	The essay has limited grammatical and mechanical errors that does not impede the understanding of the essay	The essay has no grammatical errors	1 pt
Spelling	The essay has many spelling errors that makes it difficult to understand the essay	The essay has several spelling errors that causes distraction in understanding the essay	The essay has limited spelling errors that does not impede the understanding of the essay	The essay has no spelling errors	1 pt
Application/Demonstration of APA Format	The essay does not follow APA format.	More than six minor errors or major errors in APA format.	Three to six minor errors in APA format.	No errors or minor errors in APA format.	1 pt
Source and evidence	The essay does not have any citations	Sources are cited in a inconsistent style. Many sources are missing	Sources are cited in a consistent style but missing a few citations	Sources are cited in a consistent style and are used critically	1 pt
Incorporation of Course Terms	Course terms were not used in a discussion form or were not used.	Terms from chapters 1 and 2 of the Cardon textbook were attempted in the discussion, but did not add to the discussion or connect with the concepts presented from the video.	Proficient incorporation of terminology from chapters 1 and 2 of the Cardon textbook as they correlated with the content of the video were used in discussion. At least 2 terms from each chapter were used.	Expert incorporation of terminology from chapters 1 and 2 of the Cardon textbook as they correlated with the content of the video (terms were not defined, but used in discussion). A minimum of 3 terms from each chapter for a total of at	2 pts

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