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Overcoming Boundaries in Crowdsourcing Competitions: The Case of Student Competitions in Taiwan

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ABSTRACT

Firms increasingly turn to innovation-driven student competitions to source fresh ideas and sustain competitiveness. Yet, these contests often fall short of their potential because student participants lack familiarity with corporate norms, while companies struggle to engage effectively with external collaborators. Despite the growing prevalence of such competitions, limited research has examined the micro-level engagement practices that shape collaboration outcomes, particularly the role of corporate representatives as boundary spanners. This study addresses this gap by analyzing two leading student competitions in Taiwan—ATONA Case Competition (ATCC) and Technology Innovation Competition 100 (TiC100)—involving companies X and Y. Drawing on Ernst's six boundary-spanning leadership practices, we identify an overlooked but critical seventh practice, guiding, which enables firms to bridge communication and knowledge gaps with student teams. Our findings reveal that early involvement of experts, rather than randomly assigned staff, is essential for effective knowledge brokering. While material knowledge objects help establish initial understanding, sustained success requires structured communication as competitions progress. By extending boundary-spanning theory to the underexplored context of firm–student collaboration, this study contributes both theoretically and practically: it highlights the strategic role of guiding in inter-organizational engagement and offers actionable insights for designing competitions that simultaneously enhance student learning and corporate innovation.

1. Introduction

Corporate competition is increasingly popular in globalized markets, with firms leveraging external collaborations to enhance internal innovation [46, 67]. In this dynamic landscape, customers evolve from mere purchasers to active co-creators, working alongside businesses to develop new products and services [25]. Web applications play a pivotal role in this transformation by helping

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organizations tailor experiences based on the detailed needs of current and potential customers, thereby influencing their purchasing decisions [8,56]. Open innovation emerges as a critical strategy, integrating customers into the creative processes of companies, and enhancing competitiveness and innovation [18,47]. While traditionally, product development is handled internally, the rise of social media and the availability of online information have pushed companies towards outsourcing innovation through crowdsourcing [12,13]. Crowdsourcing organizes in various forms—competitions, collaborative communities, complementors, and labor markets, with competitions being particularly prevalent due to their structured nature and ability to generate a wide range of ideas [12]. Competitions today are complex, multi-staged events designed to harness creativity over longer periods [45]. They are announced across social platforms detailing stages, criteria, and rewards to attract global participants [11]. These events often center around themes such as information technology, design, and tech applications [25,50,63], requiring participants to submit solutions that align closely with the given themes. However, the lack of practical experience among participants, for instance, students, can lead to conflicts, as they might propose ideas that are not always feasible [58]. Long-term engagement in such competitions necessitates motivational strategies to keep participants active and creative [63]. Recent research highlights the importance of learning opportunities, rapid feedback, and autonomy in maintaining high levels of participation and creativity [68]. These studies underscore the significance of intrinsic motivation and its impact on the quality of contributions in crowdsourcing settings. The challenge of managing interactions between corporate entities and participants is pivotal. Effective management of these interactions requires understanding and addressing the professional and creative needs of participants while aligning them with corporate objectives [33,73]. As competitions grow in complexity and scale, spanning boundaries between corporations and external contributors becomes essential, not just for the success of the specific event but for fostering a culture of innovation and collaboration that could significantly benefit both parties involved.

In Taiwan, prominent corporate competitions, including the ATONA Case Competition (ATCC) and Technology Innovation Competition 100 (TiC100), focus on leveraging the creativity and innovation of student participants [67]. These competitions, which emphasize product development, marketing, and application design, are structured to unfold over multiple stages, including introductory, qualifying, and final rounds. This multi-stage format is designed to deepen participants' understanding of team dynamics and business interactions, encouraging the generation of practical, innovative solutions aligned with corporate visions and missions [67,68]. Unlike typical research, which often focuses on single-stage competitions, recent studies have begun to explore the dynamics of multi-stage competitions [67,68]. However, there is still a limited understanding of how corporations manage and resolve potential conflicts between participants and corporate goals during these extended events. Moreover, little is known about corporate perceptions of competition design and the strategies used to bridge the gap between corporate expectations and student creativity. Boundary-spanning activities are crucial in these contexts, as they help connect diverse groups and facilitate the exchange of innovative ideas beyond conventional corporate thinking [5,21,30]. These activities not only promote the inclusion of external creative inputs but also support organizational managers in launching and guiding inter-organizational creative projects [73]. Recognizing and integrating such external inputs are essential for fostering organizational creativity and ensuring successful innovation outcomes [15].

Boundary-spanning activities in creative projects are under-researched, particularly regarding how companies interact with external partners, not just internal departments [3, 6, 7]. Research tends to focus on individual creativity affected by environmental factors [5, 38, 44]. This study looks at how firms manage cross-boundary interactions in competitions designed to harness innovative

ideas from Taiwanese students, addressing potential conflicts arising from the students' limited real-world experience, and how these interactions influence competition outcomes.

Breaking the boundaries among participants is one of the keys to successful competitions. Following these considerations, we aim to answer two research questions: First, how do firms increase the value of the competition result? Second, how do companies span boundaries in crowdsourcing competitions? This second question can be further divided into two sub-questions: (1) Who spans boundaries in the different stages of the competition? (2) How do they span boundaries?

Effective communication between companies and external contestants is pivotal during crowdsourcing competitions. This study leverages insights from managerial inputs to deploy a boundary-spanning leadership model, as proposed by Ernst and Yip [30] , enhancing cooperation throughout the competition's multiple stages. The framework offers practical guidelines for stakeholders to optimize communication and collaboration, ensuring improved competition outcomes. Additionally, the research highlights the educational benefits for students and universities, recognizing student competitions as valuable learning tools that boost educational effectiveness [14,34] and prepare contestants for future entrepreneurial and employment opportunities. Further details are presented in the following sections, including literature review, methodology, case analysis, discussion, and conclusion.

2. Literature Review

2.1 Crowdsourcing Competitions as Open Innovation for Firms

Crowdsourcing merges the terms "crowd" and "sourcing" to describe how businesses reach out to the public to innovate, moving tasks traditionally done internally to a broad audience via digital platforms [40,41]. Crowdsourcing is categorized into competition, collaborative communities, complementors, and labor markets [12]. These innovation competitions are increasingly vital for firms adopting open innovation strategies[18,47]. While such competitions are common, detailed studies on their execution remain scarce[10,47,65]. This research focuses on student competitions, valuable for tapping into fresh, user-generated ideas, enhancing innovation, and recognizing the contributions of students as potential users [53,54].

Companies increasingly host online competitions to harness innovative ideas and solutions, utilizing social interactive platforms where participants can share, comment, and vote [32]. These competitions typically award winners who provide viable solutions or creative ideas [54]. While initially competitions were straightforward, single-stage events focused intensely on innovation [72], they have evolved into complex, multi-stage contests inviting broader participation. This shift includes professional training to deepen participant engagement and enhance the quality of submissions, encouraging more extensive and diverse contributions [45].

Enterprises can participate in competitions as either executors or facilitators [39]. Whereas facilitators provide participants with course assistance and share enterprise knowledge during the competition, executors merely execute the competition. Competition programs might affect participants' motivation, the progress of the competition, and the effectiveness of the results [32]. Ten design elements [54] in the competition are (1) media, (2) organizer, (3) task/topic specificity, (4) degree of elaboration, (5) target group, (6) participants, (7) contest period, (8) reward/motivation, (9) community functionality, and (10) evaluation.

2.2 Boundary-Spanning in Crowdsourcing Competitions

Boundaries in organizations are crucial and necessitate management strategies for effective inter-organizational cooperation [30,71]. The role of boundary spanners is particularly significant as they influence cooperative behaviors across organizational lines, although research in diverse sectors is still needed [71]. Unlike rigid organizational structures, inter-organizational settings rely less on hierarchical control, instead depending on factors such as task complexity and trustworthiness for coordination [35,71]. In crowdsourcing competitions, where participants and organizers often do not have prior knowledge of each other, these boundary issues can impact the practicality of outcomes [4,58,59]. This study aims to explore boundary-spanning practices from the perspectives of organizers to improve the design of innovative competitions.

Organizational boundaries have been explored using various theoretical frameworks, focusing on how groups manage knowledge involving novelty, dependency, and specialization, which affect communication and idea generation [16,60]. These dynamics can create three types of knowledge boundaries in crowdsourcing: syntactic (information asymmetry), semantic (misinterpretations), and pragmatic (policy discrepancies) [17]. Santos and Eisenhardt [60] analyze boundaries through lenses including efficiency, power, competence, and identity, each providing a unique perspective on organizational roles and influences. This study seeks to bridge the gap between theoretical and practical boundary phenomena by examining how organizations manage boundaries in crowdsourcing competitions to harness innovative ideas from external contributors.

This study addresses the effectiveness and timing of teams in boundary-spanning as suggested by Marrone [49] , who highlighted the importance of coordination efforts across interdependent teams to reach shared objectives. Boundary-spanning enhances relationships and aligns goals, improving coordination effectiveness [26,42,55]. Influenced by information processing, cultural, and political factors, boundary-spanning involves three main stages: managing boundaries (self and team awareness), forging common ground (establishing shared knowledge and communication), and discovering new frontiers (advancing group objectives) [29,43,73].

Boundary spanners enhance knowledge transfer across organizational boundaries, facilitating effective communication and integration [16,17,23,55]. These individuals help clarify and ensure the complete transmission of knowledge among community members who face barriers to understanding [71]. Boundary spanners operate between groups to enable knowledge exchanges [16,17,55,70,71]. Traditionally focused on knowledge activities [2,15], research has shifted to emphasize their roles more explicitly [62]. Types of boundary spanners include gatekeepers, who manage information flow and standards; knowledge brokers, who facilitate information transfer; and boundary spanners, who connect disparate groups to foster cooperation [37].

Figure 1 includes six specific leadership practices essential for effective boundary management [30]. Boundary-spanning leadership involves six practices distributed over three stages to effectively manage inter-group relations. The first stage, “managing boundaries,” utilizes “buffering,” where participants identify their capabilities to set clear boundaries, and “reflecting,” which involves initiating communication to understand diverse group perspectives [30]. The second stage, “forging common ground,” comprises “suspending,” where members from different groups form a new team to achieve shared objectives, and “reframing,” focusing on aligning group goals. The final stage, “discovering new frontiers,” includes “nesting,” where ongoing learning makes group members indispensable, and “weaving,” encouraging members to join new groups for personal growth, thereby enhancing group integration and development [29]. These practices facilitate the transition from personal and group boundaries to a unified goal orientation across stages.

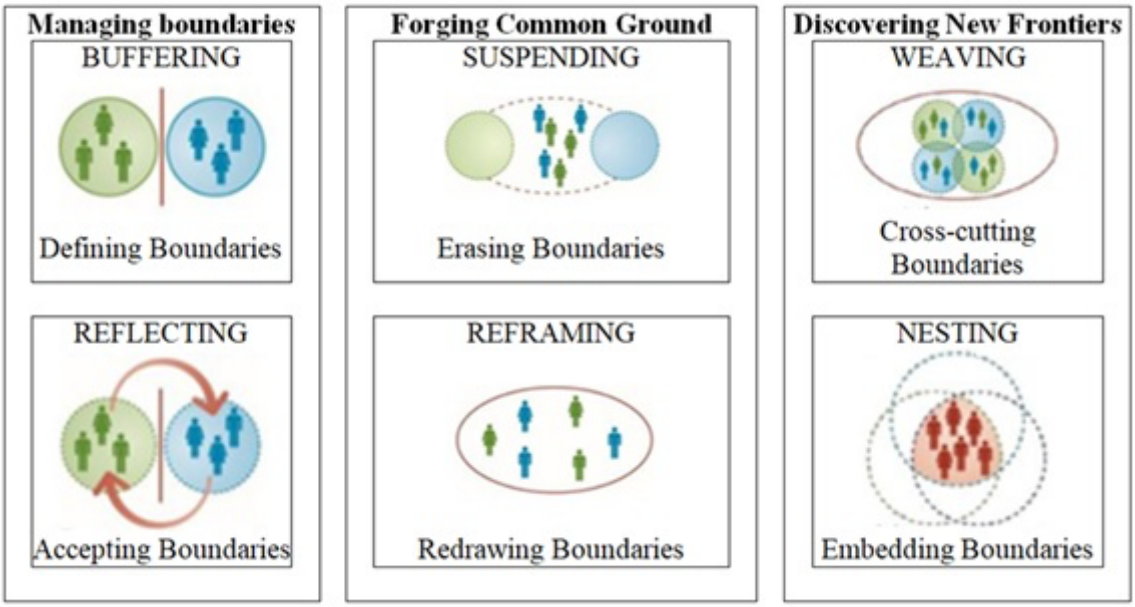

Fig. 1. Boundary-spanning leadership practices. Adapted from Ernst and Yip [30]

3. Methodology

3.1 Case Selection

In discussing the value of educational research, Eisner [28] emphasized the importance of understanding both the unique and the general patterns of human cognition and argues that representation involves transforming mental content into a publicly understandable form, allowing for examination and sharing, not just mental representation as studied in cognitive science. Simons [61] champions case studies for their potential to provide profound insights that reshape our understanding, encouraging educational researchers to challenge traditional views of creativity and to appreciate the inherent paradoxes in people and situations. Case studies employ replication logic to test theories or examine their applicability in practice, focusing on detailed, context-rich investigations rather than broad generalizability [27,74]. This method, despite its limited sample and focus on specific instances, offers a holistic view of complex phenomena, capturing the dynamic nature of organizational activities and providing a representative portrayal through multiple data sources. Researchers suggest that at least four case studies are necessary to build a sound theoretical framework [36,57,74], justifying the use of this methodology in exploring the intricacies of organizational behavior and inter-organizational competitions such as ATCC and TiC100.

Focusing on multistage student competitions, this study explores how they serve as a strategic approach for firms to harness external innovation, specifically from students who represent current or future market demographics. These competitions, particularly ATCC and TiC100 in Taiwan, not only foster deeper interactions between firms and participants but also enhance company performance by tapping into fresh, innovative ideas relevant to real-world market needs [67,68]. ATCC, organized by ATONA Inc., stands out as one of Taiwan's premier multi-stage competitions, attracting participation from major companies [9]. Since its inception nearly two decades ago, ATCC aims to address co-organizers' challenges through collaborative problem-solving. On the other hand, TiC100, initiated in 1998 and revamped in 2010 into a business model innovation contest, promotes student entrepreneurship and serves as a platform for companies to scout for innovative student ideas applicable to technological advancements [9]. This study also reflects on the experiences of companies X and Y, participants in both competitions, to draw broader educational implications for enhancing the design of such competitions. Through this, the research aims to provide actionable

insights into optimizing crowdsourcing competitions as a mechanism for open innovation within firms.

3.2 Data collection

Company X, a leading industrial computing firm, organizes the TiC100 to explore IoT-driven business models and participates in ATCC, focusing on employee benefits. Their clearly defined topics help students grasp essential concepts swiftly. Similarly, Company Y, an international high-tech manufacturer and consultant, engages in TiC100 with a focus on IoT applications for new business models and tackles practical problem-solving in ATCC using its analysis tools. Both companies encourage participants to apply innovative solutions to real-life challenges, but note that such open-ended questions may complicate short-term collaboration. This study involved extensive interviews with 11 managers from Company X across various departments and a vice president of Company Y, alongside two senior IT specialists, drawing insights from their experiences as documented on official websites and social media. The mentoring dynamics observed align with findings by Fauchald et al. [31] on the evolution of mentorship roles in entrepreneurial settings.

3.3 Data analysis

The data analysis employed a qualitative approach to interpret the semi-structured interviews conducted with members of two companies responsible for organizing student competitions. The primary goal was to extract actionable recommendations for improving the design and implementation of student competitions. This analysis followed established qualitative research practices [20, 22] to ensure rigor and reliability.

All interviews were audio-recorded, transcribed verbatim, and anonymized to protect the confidentiality of participants. To ensure accuracy, the transcripts were reviewed against the recordings, as suggested by Merriam and Tisdell [51] . Preliminary readings of the transcripts enabled an initial understanding of the data and facilitated the identification of recurring themes relevant to the organization of competitions and boundary-spanning processes. The data preparation phase adhered to qualitative data management standards outlined by Miles *et al*., [52] .

Thematic analysis was used to systematically organize and interpret the data [20]. A hybrid coding approach, combining deductive and inductive methods, was applied. Predefined themes, such as competition processes and boundary-spanning mechanisms, were derived from the research objectives and prior literature on organizational collaboration and boundary management [16,48]. Microsoft Excel was employed to facilitate the organization and retrieval of codes for cross-case comparisons.

The analysis framework focused on two main aspects. First, the competition processes were examined to identify distinct stages, including planning, execution, and evaluation. For each stage, the analysis detailed the roles, responsibilities, and challenges faced by organizers. This aligns with the process-oriented approaches emphasized in the project management literature [69]. Second, the boundary-spanning processes were analyzed to understand how collaboration was facilitated across organizational and situational boundaries. Particular attention was paid to the roles of boundary spanners, critical stages requiring boundary activities, and the tools or objects—such as shared documents, platforms, or symbolic artifacts—used to manage boundaries [1,16].

To ensure validity, data from interviews were triangulated with organizational documents, such as competition guidelines, marketing materials, and, where feasible, observations of competition events. Triangulation enhances credibility and provides a fuller picture of the phenomena under

study, as advocated by Denzin and Lincoln [24] . This approach confirmed the consistency of themes across data sources, contributing to the robustness of the findings [1,22].

The fourth section: Case analysis, summarizing competition processes, highlights the key stages, individuals involved, and actions taken at each stage, and focuses on boundary-spanning processes, detailing the roles of boundary spanners, stages requiring cross-boundary collaboration, and the tools or artifacts used to facilitate these interactions [48]. These structured presentations align with recommendations for clear data reporting in qualitative research [66]. Additionally, a section of recommendations is included, offering actionable suggestions for enhancing the organization and execution of student competitions.

This analysis illuminates how student competitions are organized and managed in two selected companies. By mapping competition and boundary-spanning processes, the study identifies best practices and systemic challenges, thereby contributing to the literature on organizational collaboration and event management [17,69]. The findings provide evidence-based recommendations for improving student competitions, ensuring they are not only logistically efficient but also foster meaningful participant engagement. This approach underscores the importance of integrating boundary-spanning theories with practical insights to enhance collaborative outcomes in organizational settings.

4. Case Analysis

4.1 Case Study: ATCC

ATCC is structured into five phases: propaganda, tryout, preliminary selection, semifinal, and final, where company-set challenges reflect specific organizational objectives. Company X focuses on crowdsourcing to identify innovative ideas and enhance its corporate social responsibility profile. ATCC's structured approach on its platform educates students about the IT industry through hands-on tasks. Company Y aims to attract future employees, foster social responsibility by teaching new technologies, and gather user feedback to test products and explore new applications, as revealed in interviews with representatives from both companies. The interviews reveal six steps in the boundary-spanning processes of companies X and Y:

(1) Buffering, or defining the company's boundaries;
(2) Reflecting, or transferring company information to students;
(3) Guiding, or unifying students;
(4) More reflecting, or transferring student information to the company;
(5) Suspending, or students leaving and having more intensive interaction;
(6) Reframing, or helping participants find common goals and build new groups.

4.1.1 Boundary-spanning in ATCC

This section introduces the boundary-spanning processes of companies X and Y, respectively, in the five stages of ATCC, namely, propaganda, tryout, preliminary selection, semifinal, and final.

Stage 1: Propaganda

At the start of ATCC, the company sets competition objectives through internal discussions, then publicizes details such as the process and registration. This early phase is characterized by pragmatic boundaries due to unclear goals, requiring the application of the buffering practice. A senior manager acts as a gatekeeper to establish participation boundaries.

Stage 2: Tryout

Students submit innovative proposals to the company, receiving guidance from mentors on refining their ideas and fostering unity. The "reflecting" practice addresses syntactic boundaries here. As team goals may still be unclear, a pragmatic boundary arises; guiding is effective for crossing this boundary. Diverse student backgrounds complicate cooperation, prompting the company to foster a unified team goal.

Stage 3: Preliminary selection

During the preliminary selection, organizers assess which teams can enhance the idea's feasibility for the company. Initially, students work with indirect information, creating a syntactic boundary due to insufficient data for solutions. With increased access to firsthand information—such as site visits and training—semantic boundaries arise from potential misunderstandings. Reflective practices help students align with mentors' guidance, clarifying goals and methods.

Stage 4: Semifinal

During this stage, the company selects the best participant proposals and enhances their logical structure. It guides participants in presenting their ideas effectively and verifying their viability, including training in presentation skills to improve clarity and understanding. Despite improvements, gaps in student knowledge create syntactic boundaries, while challenges in immediate comprehension may lead to semantic boundaries. To address these issues, the practice of suspending is employed, facilitating better alignment between students' proposals and the company's expectations, and ensuring clearer communication paths in later competition stages.

Stage 5: Final

In ATCC's final stage, companies vote for the top teams, who must finalize their projects for judging and collaborating in newly formed teams. If students' and companies' goals misalign, winning becomes tougher, creating a pragmatic boundary. Reframing is the key boundary-spanning practice applied here to realign goals and strategies.

4.2 Case Study: TiC100

TiC100 is structured into four stages: propaganda, preliminary selection, semifinal, and final, focusing on launching new businesses related to the company's activities, differing from ATCC's problem-solving approach. In each stage, different boundary challenges arise. Companies X and Y manage these challenges through a five-step boundary-spanning process: initially setting competition themes and suitable business types (buffering), exchanging information (reflecting), guiding teams pre-semifinal (guiding), making student business models executable (suspending), and finally, mentors and students team up to compete (weaving).

4.2.1 Boundary-spanning in TiC100

This section presents the boundary-spanning processes of companies X and Y over the four stages of TiC100, namely, propaganda, preliminary selection, semifinal, and final.

Stage 1: Propaganda

At the onset of TiC100, the company holds internal meetings to finalize the competition's new business theme, involving various departments once a decision is reached. During this phase, a lack

of unity among participating employees creates a pragmatic boundary, addressed through the buffering strategy with top managers acting as gatekeepers for departmental participation. Additionally, students unfamiliar with the competition and lacking the necessary information face a syntactic boundary. Misunderstandings still occur despite efforts to disseminate competition details, forming a semantic boundary. To mitigate this, the company organizes information sessions, offers an online platform for queries, and helps participants form teams based on their submitted backgrounds.

Stage 2: Preliminary Selection

In the TiC100 competition, students select from over 20 business categories, receiving tailored questions based on their backgrounds. They visit related sites to deepen their understanding. However, their limited professional experience can create syntactic boundaries due to unclear ideas. Misunderstandings among students might also introduce semantic boundaries, with the boundary-spanning practice of reflecting used during the preliminary selection stage to aid clarity.

Stage 3: Semifinal

Before the semifinal in TiC100, participants often face a pragmatic boundary due to unclear team goals, which is addressed through the boundary-spanning practice of guiding. Knowledge brokers provide lessons and share experiences to foster effective teamwork. At the semifinal stage, the focus shifts to refining business concepts and presentation skills. Inadequate proposal writing or presentation skills can create syntactic boundaries, while misinterpretations of competition goals may lead to semantic boundaries. To overcome these boundaries, the company organizes workshops to enhance participants' knowledge, presentation abilities, and teamwork. During this phase, activities such as lectures, World Café, and coaching sessions are employed, involving experts and mentors who assist in business plan development and logical proposal structuring. This comprehensive support helps participants refine their business plans and align more closely with competition objectives.

Stage 4: Final

In the final stage of TiC100, each company sends one or two teams to compete. The firms encourage teams to develop their business ideas further and continue providing support to enhance their projects. Successful collaboration between participants and companies is crucial; otherwise, a lack of cooperation may lead to a pragmatic boundary. To overcome this boundary, companies might use reframing strategies, such as signing contracts to transfer ownership of the business plans to the companies. Although implementing these ideas in real business scenarios is challenging, participants gain significant learning experiences and value the guidance from their mentors throughout the competition.

5. Discussion

5.1 Boundary-Spanning Leadership Practice: Guiding

This study assesses competitions at two case companies, highlighting the problem-driven phenomena in student competitions by incorporating theories [30,60,71]. Findings reveal that hastily formed teams, due to diverse backgrounds and a lack of cooperative experience, often face internal boundaries that can reduce the competition's effectiveness (Table 1). Companies offer training to bridge these gaps, aiming to align team efforts with competition goals [73]. Extending previous research, this study suggests adding "guiding" as a seventh boundary-spanning practice to enhance

cooperation and competition outcomes, recognizing its absence in earlier studies on boundary-spanning. Therefore, we put forth our first recommendation as follows:

Recommendation 1: Guiding is likely an important boundary-spanning leadership practice to enhance project performance.

5.2 The Role of Knowledge Brokers

Knowledge brokers act as bridges between different organizational levels and areas [55], aiding students in competitions where industry knowledge is scarce. The disparity in students' understanding levels adds to the brokers' challenge. Initially, brokers from specific departments guide students, but as the competition advances, brokers from other areas also contribute, offering diverse perspectives and enhancement suggestions for student projects. Thus, our second recommendation is as follows:

Recommendation 2: Knowledge brokers should be experts rather than random staff from the organizing company.

5.3 The Effect of Knowledge Objects

In early competition stages, companies transform all data into accessible knowledge objects for contestants, ensuring broad and efficient information distribution [1]. Direct communication with many contestants early on is inefficient; instead, knowledge objects allow contestants to self-serve the necessary information swiftly. As the competition progresses and contestant numbers dwindle, direct communication becomes crucial to clarify misunderstandings and ensure all teams fully comprehend the tasks. This shift from reliance on knowledge objects to direct interaction helps maintain the relevance and applicability of the contestants' contributions, aligning their outputs with the companies' expectations. Effective communication in the later stages is vital for transferring knowledge accurately and supporting contestants in developing feasible solutions. Hence, we state our third recommendation as follows:

Recommendation 3: Knowledge objects are the most effective tools for transferring knowledge in the early stage of the competition only. In later stages, participants should focus more on communication.

6. Conclusion

Our study applies boundary-spanning theories to student competitions, highlighting gaps in traditional studies that often focus on familiar environments within companies. It extends the application of boundary-spanning practices, traditionally used within companies, to the unfamiliar context of student competitions, introducing 'guiding' as a new practice for improving collaboration among diverse, hastily-formed teams. The study finds that early engagement and consistent guidance by companies using structured practices such as buffering, reflecting, and guiding can significantly improve competition outcomes by fostering better teamwork and idea development among students. The research also stresses the importance of effective communication and knowledge sharing from the early stages of competitions, suggesting that more interactive and supportive approaches from companies can enhance the creativity and feasibility of students' submissions. It advocates for the strategic use of knowledge brokers to bridge information gaps between companies and participants, enhancing the overall quality and applicability of competition entries. Additionally, this study underlines the potential of student competitions as tools for

entrepreneurial education, suggesting that more focused research could explore their role in bridging the gap between academic learning and practical business challenges, especially in fostering entrepreneurship among students.

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Table 1

Boundary-Spanning practices across competition stages (N/A: not applicable)

Stage		**Stage 1: Propaganda**	**Stage 2: Tryout**	**Stage 3: Preliminary selection**	**Stage 4: Semifinal**	**Stage 5: Final**
Boundary-spanning leadership practice		**Buffering**	**Guiding**	**Reflecting**	**Suspending**	**Reframing**
Boundary type	**Syntactic boundary**	Less information about the competition	Less information about the participants	Limited information about the proposition	Lack of knowledge about the business plan and presentation skills	N/A
	Semantic boundary	Misunderstanding of the competition/propositions	N/A	Misunderstanding of the propositions	Misunderstanding of the propositions, business plan, and presentation skills	N/A
	Pragmatic boundary	The company's goals are not clear	Students' goals are not clear	N/A	N/A	Participants' goals are not clear
Implementation		1. Website promotion 2. Promotional video 3. Facebook fan page 4. Offline seminar	1. Registration 2. Workshop	1. Site visit 2. Group workshop	1. Workshops 2. Coaching sessions	Final modification
Boundary-spanning role	**Boundary Spanner**	Suitable manager(s)				Participants and mentors from the company
	Knowledge Brokers					
	Gatekeepers					
Boundary-spanning channel	**Knowledge Objects**	1. Website 2. Promotional video 3. Facebook fan page 4. Presentation files	Presentation files	Presentation files	N/A	N/A
	Communication	Online and offline Q&A sessions	Lectures	1. Lectures 2. Discussion	Discussion	N/A
	Build Relationship	Meeting	Group discussion	N/A	N/A	Frequent interaction