

## **Decoding Challenges in Organizing Innovation Competitions and Programs: A Thematic Analysis of Interviews with Organizers**

**Fay Berig, Pennsylvania State University, Berks**

**Dr. Sadan Kulturel-Konak, Pennsylvania State University, Berks Campus**

Sadan Kulturel-Konak is a professor of Management Information Systems and the director of the Fleming Creativity, Entrepreneurship and Economic Development (CEED) Center at Penn State Berks. She received her Ph.D. in Industrial and Systems Engineering (Auburn Univ.)

**Dr. Abdullah Konak, Pennsylvania State University, Berks Campus**

Dr. Abdullah Konak is a Distinguished Professor of Information Sciences and Technology at the Pennsylvania State University, Berks. Dr. Konak also teaches graduate courses in the Master of Science in Cybersecurity Analytics and Operations program at the College of Information Sciences and Technology, Penn State World Campus. Dr. Konak's primary research interest focuses on modeling, analyzing, and optimizing complex systems using computational intelligence combined with probability, statistics, data sciences, and operations research. His research also involves active learning, entrepreneurship education, and the innovation mindset. Dr. Konak's published numerous academic papers on a broad range of topics, including network design, system reliability, sustainability, cybersecurity, facilities design, green logistics, production management, and predictive analytics. He has been a principal investigator in sponsored projects from the National Science Foundation, the National Security Agency, the U.S. Department of Labor, and Venture Well.

# **Decoding Challenges in Organizing Innovation Competitions and Programs: A Thematic Analysis of Interviews with Organizers**

## **Abstract**

Educational programs like innovation competitions and programs (ICPs) play a pivotal role in entrepreneurial development among student participants. Students focusing on science, technology, engineering, and mathematics (STEM) fields tend to benefit from participation in ICPs. Higher education institutions and foundations have broadened their co-curricular offerings to attract and support student innovators. These include design challenges, hackathons, start-up incubator competitions, boot camps, customer discovery labs, and accelerator programs. Hence, student ICPs are increasingly instrumental in shaping the education of the next generation of innovators and critical thinkers. Furthermore, organizers have a crucial role in ensuring the success and feasibility of innovation and pitch competitions. The successful implementation of such programs often entails myriad challenges and setbacks that organizers must overcome to benefit their participants. This paper explores the challenges organizers face while running student ICPs - non-credit, co-curricular, team-based initiatives where students collaborate to address open-ended problems. The literature review and analysis of organizer interviews will explore current trends, similarities in challenges and setbacks, and provide a concise overview of best practices that organizers can adopt to ensure the success of innovation competitions and programs. The main goal is understanding the obstacles organizers encounter when establishing and executing their ICPs.

*Keywords:* Innovation Competitions and Programs; Organizers; Challenges

## **Introduction**

Innovation competitions and programs have evolved into powerful platforms enabling students to showcase their talents, gain skills, and let their creativity flourish, especially in engineering programs. ICPs allow for cultivating critical thinking, creativity, and networking across all disciplines [1]. Participation enables students to foster innovative ideas and apply them to real-world scenarios [1]. Students can develop leadership qualities by navigating a technical and innovative ecosystem, like an ICP, that provides practice opportunities [2]. The success of ICPs relies on the effective implementation of best practices by their organizers and coordinators. An organizer must keep the best interests of their participants in mind when planning, running, and executing these competitions and programs [3]. Organizers play a pivotal role in shaping the educational landscape for ICP participants by providing platforms that nurture an effective and productive learning environment. Exposure and participation in ICPs can facilitate and foster opportunities beyond their competitive nature. Organizers can provide various networking, mentorship, and collaborative opportunities for ICP participants [2].

Organizing an ICP requires many tasks, which can be grouped into the following phases: (i) planning, (ii) launching, (iii) execution, and (iv) following up. The tasks in the planning phase

involve defining objectives and scopes of ICP, identifying judges and mentors, setting up logistics, preparing promotional materials and media, clarifying guidelines and policies, and finally finding resources and outside collaborators. The launch phase is about increasing the awareness of the ICP and recruiting students to participate. The execution phase is when the ICP takes place. ICP can last from one day (a hackathon) to several months, depending on the scope and topic. During this process, participants may receive mentoring and training. ICP organizers actively manage these processes as well as logistics during the execution phase. Managing the judging process is an important task during the execution phase. In the follow-up phase, ICP organizers aim to encourage the participant team to continue with their projects or ideas.

Running a successful ICP involves facing several challenges and setbacks in each of the ICP phases. The process of organizing ICPs can be overwhelming and requires effective time management, adequate resources, and careful planning [4]. Organizers often face challenges that require careful attention and navigation to ensure successful and impactful ICPs. ICP organizers could be faculty or staff volunteers since most ICPs might not be directly tied to academic programs, or institutions may not have dedicated units to run these programs. In such cases, addressing these challenges and supporting volunteer ICP organizers is critical for the sustainability of the programs. In addition, the way students experience their ICP can greatly influence their learning outcomes and shape their attitudes toward innovation and entrepreneurship. A poorly executed ICP can hurt students' perspectives. Because of these reasons, this paper aims to discover challenges and setbacks ICP organizers face through an interview research approach and provide strategies to cope with them to improve student learning outcomes.

Some prominent challenges discovered in the thematic analysis of organizer interviews included financial and funding, COVID-19 limitations, time constraints, and overall planning setbacks. Despite the challenges, ICP organizers can provide valuable experiences and opportunities for students to thrive in an innovative environment.

## **Literature Review**

### ***Successful ICPs***

Organizers face an array of challenges when planning, running, and organizing ICPs. The participants' success largely depends on the organizers' persistence and commitment to managing competitions and programs. To ensure a productive and meaningful outcome, organizers must consider participants' motivation, platform design, and operationalization [5]. They should also dedicate their time and efforts to synchronizing teaching and ideation, defining the task, and providing pitch workshops [6]. ICPs specifically target those who strive to display their skills, talents, and creativity to offer a solution for a specific task designed by an organizer who seeks an innovative solution [5]. Organizers must remain confident in ensuring that their ICPs provide room to foster an innovative mindset, ideas, and critical thinking skills and allow participants to grow within a structured environment. Organizers must also establish effective leadership to set a tone for cooperation and coordination. A successful ICP requires a well-organized team with clear responsibilities and open communication channels [7].

One great way to ensure a successful ICP is to position the competition around a specific need [8]. For example, organizers must be careful when creating a competition and design an opportunity for open-ended responses and solutions. Open-ended challenges and pitch competitions drive innovation and participation by yielding ambiguous results [8]. Organizers may struggle to provide resources like classes, tutorials, and mentoring to support participants during competitions [8]. A successful ICP can also incorporate a series of networking, mentoring, and collaborative opportunities for participants. The colleges and universities hosting ICPs are also positively impacted by hosting such events due to increased opportunities for mentoring and networking, entrepreneurial achievement, and acting as community role models [3]. Organizers provide opportunities for students to gain real-world advice and increase entrepreneurial self-efficacy by inviting entrepreneurs to their programs [3].

In general, there is also a significant difference between running competitions and organizing innovation contests within the public and private innovation sectors. The public sector addresses societal challenges within government functions, while private sector innovation creates products and ideas within private organizations [9]. In the public sector, various contests are integrated, ranging from hackathons and pitch competitions to online idea platforms. Larger competitions require more intense training and management skills but oftentimes attract more participants and lead to better solutions. While competitions in the private sector are targeted at well-defined problems that make it accessible to identify best practices, those in the public sector are focused on broader aims that strengthen strategic leadership and innovation skills [9]. For example, public sector hackathons typically aim to increase student and community participation, especially in decision-making [10].

### ***Dealing with Challenges***

An important aspect of organizing an ICP is the ability to adapt, pivot, and overcome challenges. However, instead of dealing with a specific setback or challenge precipitously, organizers must consider breaking up challenges into smaller, manageable steps (Rathi, 2014). This approach enables organizers to alleviate any overwhelming feelings they may experience. Organizers also face the common challenge of facing certain time constraints and limitations. By sticking to a timeline and working through the phases of an ICP step by step, organizers can portray their ongoing commitment to their programs [7]. Well-organized ICPs lead to reliability, efficiency, and stability, which help achieve many goals [11]. Another fundamental challenge in organizing ICP is planning, considering, and organizing smaller but significant details such as travel and scheduling. Requiring teams to travel long distances might pose a greater risk of accidents [12]. Organizers must also carefully set dates and times for their programs. Due to safety concerns, it is important to consider students' exam schedules, as there is a higher risk of travel accidents when a student is sleep-deprived, worried about academics, or rushing between classes [12].

Pitch and innovation competitions, hackathons, and other events allow participants to demonstrate their entrepreneurial skills and mindsets in solving problems and carrying out ideas in front of an audience or a set of judges for evaluation. The impact of COVID-19 has forced many of these events to turn virtual, negatively impacting the importance of having a live audience [3]. The pandemic also affected organizers by creating challenges such as losing judges and mentors due to unemployment, underemployment, and sickness [3]. The lack of judges and

mentors can affect participant learning ability, selection bias, reduced applicant pool size, and event cancellation. Many participants had to reformat their presentations to fit virtual and online conditions in many pitch competitions [3]. The impact of COVID-19 also impacted students' emotional and mental health needs. Organizers must consider their participants' human needs to run a modified ICP effectively. Many organizers found that the need for remote modification of many ICPs was an opportunity to foster innovative thinking skills among the participants [13]. However, the transition to an online setting posed a challenge for many. Organizers faced a challenge of technological limitations during the pandemic. Handling many online software, platforms, and programs was a significant setback in ensuring the efficiency of ICPs [14].

In running and operating innovation and pitch competitions as well as other events, organizations and organizers must understand the importance of a certain prize, whether it's monetary or physical. A prize is also looked at as an innovation strategy offered to a participant who is able to provide the best and most useful solution to a problem [15]. Since the 2000s, these awards have significantly changed and expanded their scope. They now allow top contestants and winners of business plan and innovation competitions to establish and operate their own startups and companies. These awards also provide valuable support and professional advice to emerging businesses [16]. Organizers must consider eliminating financial stressors while planning ICPs. Studies have shown that organizers who invest more in a larger monetary prize or incentive rather than gadgets tend to have more successful ICPs [17].

## **Research Methodology**

This study employed a qualitative approach, gathering interview responses from various ICP organizers throughout universities across the United States. The organizers interviewed represent diverse higher education institutions with prior experience and expertise in organizing and managing ICPs. This research study was comprised of three main phases. Initially, we conducted an extensive literature review on ICPs, specifically focusing on organizers' challenges. The literature was classified into two sections: (i) characteristics of running a successful ICP, and (ii) how organizers deal with challenges. We then formulated interview questions to delve deeper into the perspectives of challenges from organizers. The study interviewed 31 organizers who had previous involvement in student ICPs. The collected data pertained to their engagement, experiences, and challenges. After conducting the interviews, we transcribed them and carried out a comprehensive analysis of the data collected.

The interviewees in this project were drawn from various universities, including Pennsylvania State University, Oregon State University, Cornell University, Lehigh University, West Virginia University, and Temple University. In addition to reaching out to potential organizers via email, opportunities to participate or be interviewed were announced at multiple conferences. Those who responded to our emails or expressed interest in joining the study underwent further interviews where they were asked a series of questions to gain insights into ICPs. Out of the 31 interviewed organizers, 17 identified as female, and 14 identified as male, making up approximately 55% and 45%, respectively. Regarding their experience in organizing ICPs, 22 out of 31 ICP organizers (70%) had more than 6 years of experience, 6 (20%) had 3-5 years of experience, and 3 (10%) had less than 2 years of experience.

The research team utilized video conferencing via Zoom to conduct interviews remotely. These interviews were conducted independently at scheduled times, lasting between 20 to 40 minutes each. Consent was obtained before recording the sessions using Kaltura. The recorded session transcripts were then generated through Kaltura’s automated system. To validate the accuracy of the transcripts, they were cross-referenced with the original video recordings and categorized based on specific questions. Finally, the transcribed interviews were uploaded into NVivo, a qualitative data analysis software where the research team coded the responses.

The main goal of the analysis was to identify the challenges of the ICP organizers. Therefore, we analyzed the responses to the interview question: “What are the challenges/obstacles you faced while setting up and running your programs?” in this paper. We used a grounded theory approach [18] to analyze the interview transcripts. In the first phase, we reviewed the interview transcripts and employed an “open coding” technique without considering a theory to identify distinct codes recurring in the transcripts, as given in Table 1. After individual codes were determined, three research team members independently went through the transcripts to determine whether each code was present or not in the transcript. The three codes were combined together, and the inter-rating agreement among the independent raters was calculated using the Fleiss Kappa function in R. The resulting Kappa value was 0.517 with  $z=33$  and  $p=0.0$ , indicating a moderate, statistically significant agreement among the raters.

During the next phase, two research team members analyzed the codes and transcripts and grouped the related codes to form broader themes of challenges, as shown in Table 1, using a consensus approach. Then, we calculated the number of times the organizers mentioned the themes to investigate the relative importance of the broader challenges and the frequency with which the same organizer mentioned the themes together to understand the relationships among the themes. In Figure 1, the size of each node represents how often that theme was mentioned. The thickness of the links, or edges, represents how frequently the pair of themes were mentioned together. As seen in Figure 1, all challenges mentioned by the organizers are closely related to one another, except for ‘Interpersonal Challenges.’ The “Logistics and Operations” was the most frequently mentioned challenge by the organizers. The second most frequently mentioned challenge was ensuring and sustaining “Student engagement and Recruitment.” The strong connection between these two theme nodes indicates that most organizers identified these two challenges together. Ensuring student engagement and recruitment requires effective logistics and operations. The next level of the challenges was “Inclusion and Diversity” and “Funding and Sustainability.”

Table 1. Codes and related broader themes

| Theme                    | Codes                                                                                                                                                                                                                                                                                                                                            | Description                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Logistics and Operations | Being worried about it running smoothly; Challenges creating a network to support students; Creating and sustaining the infrastructure; Getting funding directly to students; Logistical problems; Making sure food is taken care of; Organizing transportation; Overall time constraints; Planning events and dealing with internal challenges; | All logistical and operational aspects like scheduling, transportation, meals, creating infrastructure, managing time constraints, legal guidelines etc. |

|                                    |                                                                                                                                                                                                                                                                                     |                                                                                                                                                                             |
|------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                    | Scheduling; Time Intensive; Uncertainty due to COVID; Working around legal guidelines.                                                                                                                                                                                              |                                                                                                                                                                             |
| Student Recruitment and Engagement | Competing with other school organizations; Students feeling burnt out, Students not having time; Continuous Improvement through feedback; Making students able to see the value; Recruit students; Visibility and promotion; Understanding students need time with their resources. | Student recruitment, retention and engagement activities like managing participation, ensuring continuous improvements based on student feedback etc.                       |
| Inclusion and Diversity            | Being flexible to support all attendees; Having an unfair advantage or priority; Integrating inclusion and DEI into programs; Keeping programs open to all majors; Making entrepreneurship minor welcoming to any student.                                                          | Inclusion and diversity elements like integrating DEI, ensuring flexibility to support all attendees, eliminating unfair advantages and keeping programs open to all groups |
| Funding and Sustainability         | Finding sources for funding; Hard to sustain support; Lack of recognition, Having institutional buy-in; Other priorities and responsibilities of organizers.                                                                                                                        | Funding sources, allocation, budgeting and ensuring financial sustainability of programs over time                                                                          |
| Strategic alignment                | Differentiating innovation and entrepreneurship; Finding the best startups to invite; Quantity vs quality submissions; How success is evaluated.                                                                                                                                    | Strategic aspects like differentiating offerings, defining the scope and focus of the competitions, and how to evaluate the impact of ICPs                                  |
| Assessment and Evaluation          | Fair Judging; Having qualified and diverse judges.                                                                                                                                                                                                                                  | Judging procedures and having fair criteria                                                                                                                                 |
| Interpersonal Management           | Being new at the university; Being shy in front of crowds.                                                                                                                                                                                                                          | Interpersonal challenges faced by individual organizers                                                                                                                     |
| Enhancing Student Learning         | Taking the next step in evolving competitions; Increasing student benefits and learning.                                                                                                                                                                                            | Aligning student needs around learning with program offerings to maximize learning.                                                                                         |

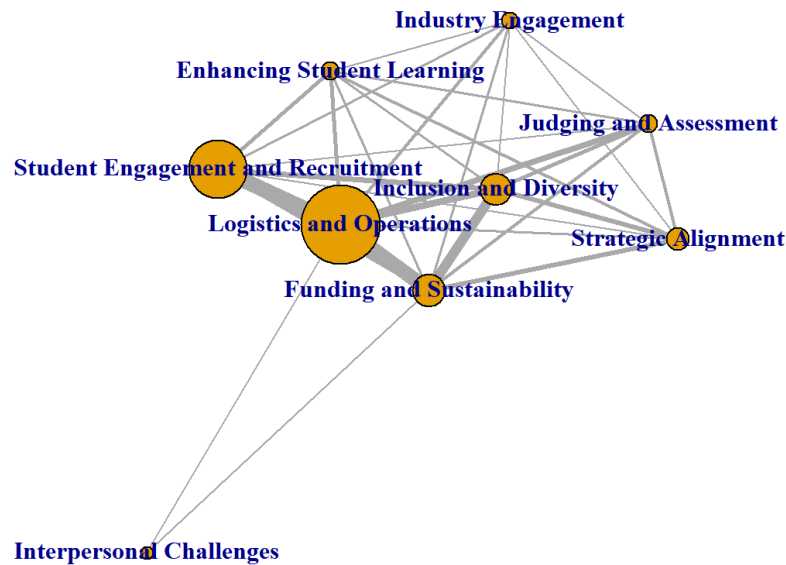


Figure 1. The relationship between the emerging themes

## Discussions

In this section, we explore the themes expressed in the challenges organizers reported facing. The themes were created based on codes found by our researchers. Firsthand quotes and examples from the organizers interviewed also support the themes.

### A. Logistics and Operations

When organizing and running ICPs, organizers tend to face predominant challenges within the logistical and operational aspects such as scheduling, transportation, meals, creating infrastructure, managing time constraints, legal guidelines, etc. This study portrays the overarching logistical challenges that organizers might face while planning, running, and executing ICPs. One organizer mentioned,

*“And the other thing is transportation. How do you get them there? How do you get them back? Did they eat or did they starve? ... So you have to make sure that the food is there... Do you bring the students all in one bus or do the students have to drive there on their own? That’s a logistical problem and it could be a logistical nightmare.”*

### B. Student Recruitment and Engagement

Student recruitment and engagement are significant aspects of running a successful ICP because they foster an innovative and entrepreneurial environment amongst participants, mentors, and organizers themselves.

One organizer stated, *“So the challenges we faced were how to achieve our goal of making the Entrepreneurship minor here at the university truly interdisciplinary, accessible and welcoming to any student at any campus in any major.”*

Another organizer mentioned, *“And so trying to find ways for them to get academic credit to work on entrepreneurial ventures is probably the thing that I struggle with the most, trying to find different opportunities for the students and making them realize the value of that.”*



### C. Inclusion and Diversity

Maintaining an inclusive and diverse environment for students was a strong challenge among many organizers. A significant aspect of inclusion and diversity is ensuring that organizers are flexible in supporting all participants and attendees.

One organizer mentioned, *"...So that is a continual challenge, is evolving and being flexible so that we can address all of our attendees, all of our startups, all of our judges, and our entire audience. That's an ongoing challenge every year."*

Another organizer stated, *"...We really wanted it to be inclusive and cross-campus"*

### D. Funding and Sustainability

Organizers faced many challenges in acquiring funding and ensuring the sustainability of ICPs over time.

For example, one organizer stated, *"So I would say the greatest challenge financially is creating and sustaining the infrastructure that supports the entire program from, you know, what to do with your idea through, you know, each end-of-year grand prize and all the, all the documentation coaching, additional sessions that take place in between."*

### E. Strategic Alignment

The theme of strategic alignment represents challenges within strategic aspects of ICPs. Some examples include differentiating offerings, curating startups, judging criteria, and evaluation procedures. This theme is focused on reaching out to appropriate students for the objective programs and aligning ICP objectives with the learning objectives of the academic programs.

One organizer mentioned, *"A few challenges are, we always hope that we have picked the, quote, unquote best startups possible to come to the competition."*

Another organizer mentioned, *"My experience, if you inform students and educate the world of competition there will be a natural plateauing of applications."*

### F. Assessment and Evaluation

Many organizers expressed challenges revolving around fair judging and evaluation criteria.

An organizer mentioned, *"Another challenge for me again is making sure that I have enough qualified in diverse judges for the competition. That I have enough judges who are sector specialists and can properly assess a startup or young company that's before them."*

Another organizer stated, *"...So sometimes there's a huge discrepancy because every single judge sees a different way. So making sure that all the judges are in alignment."*

### G. Interpersonal Management

In our study, many organizers conveyed facing and dealing with individualized interpersonal challenges. Such challenges included shyness and adapting to a new university environment.

One organizer mentioned, *"I might not come off this way, but I'm a shy person, getting up in front and now we're doing everything virtually, but we used to do it live. And so I'd have a room full of people, 20 or 30 people. For the finale, we have like 100 people in that room."*

Another organizer stated, *"So being new here, not knowing the lay of the land, the ecosystem, any of that. That was a big challenge."*

## H. Enhancing Student Learning

Organizers must keep the student's interests in mind when planning and running ICPs.

Organizers tend to express challenges with aligning student needs around learning with program offerings to maximize educational benefits.

One organizer stated "...but one of the biggest challenges is that we are not going this is our playbook and we are sticking with it, we constantly are evolving what our competitions are like. Even though they may be the same competitions, like we have more of the investment style and then our large competition."

## Conclusions

Conducting a thematic analysis of the 31 organizer interviewees' responses allowed us to recognize and analyze the overall challenges that organizers face while planning and running ICPs. This study utilized an interview-based and qualitative research methodology to address the disparity between the firsthand interviews and the literature review by understanding the challenges from the organizers' perspectives. The analysis of interviews helped us identify challenges expressed by organizers when running or planning ICPs. Such challenges included logistics and operations, student recruitment and engagement, inclusion and diversity, funding and sustainability, strategic alignment, assessment and evaluation, interpersonal management, and enhancing student learning. Assessing and tackling these challenges allows organizers to produce a best-practice approach and enhance educational and personal performance among participants. Opportunities for growth, learning and improvement lie within the obstacles and challenges of innovation and pitch competitions. Further research will explore the best practices organizers utilize when dealing with these challenges while planning and running ICPs.

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